2025-2026

COURSE CATALOG

Bucknell UNIVERSITY

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ABOUT BUCKNELL

Bucknell was established in 1846 as the University at Lewisburg, the nation's 100th college or university in order of founding. It was renamed in 1886 in honor of William Bucknell, a major benefactor. It has enrolled women since 1883 and, although founded by Pennsylvania Baptists especially to train teachers and missionaries, it always has been open to students and faculty of all religious faiths and it is nondenominational today.

Over the years, the University has steadily evolved from a local, denominational institution to a highly visible national institution. The 3,920 undergraduates and 49 graduate students are drawn from most states and 63 countries, including 21 percent who are students of color and 4 percent from abroad. Prospective undergraduate interest is such that only 29 percent of applicants can be admitted.

Among the institutions sharing the interests of Bucknell's applicants each year are most of the Ivy League universities, other prominent doctoral institutions such as Duke and Carnegie Mellon, and many of the finest liberal arts colleges, underscoring Bucknell's considerable stature in its 177th year.

The range of institutions with which observers align Bucknell bespeaks the University's distinctive institutional type. This type is decidedly undergraduate and collegiate, providing for personalized, liberal learning, yet it incorporates the curricular complexity and scope of significantly larger institutions.

Professional and preprofessional programs in the College of Engineering, music, education, and the Freeman College of Management do more than coexist with the liberal arts and sciences. All of these programs operate with obvious excellence and they often function synergistically to enhance the intellectual transformation of students that is Bucknell's raison d'etre.

The Bucknell model for higher education dates to the late 19th century and the earliest years of the 20th century, when the University's fourth president, John Howard Harris, oversaw the institution of the engineering programs, the expansion of the education program, and the introduction of pre-law and pre-med programs.

Bucknell University awards bachelor of arts and bachelor of science degrees in more than 65 fields, including nine interdisciplinary programs: animal behavior, cell biology/biochemistry, comparative humanities, mathematical economics, environmental studies, international relations, Latin American studies, neuroscience, and women's & gender studies. Approximately 64 percent of the students are enrolled in the College of Arts & Sciences, 18 percent in the College of Engineering, and 18 percent in the Freeman College of Management. A small number of master's degrees are awarded in selected fields.

The undergraduate curriculum capitalizes on the strengths of Bucknell's entering students – the drive to succeed, a curiosity to understand, a desire to find meaning in daily life – while providing the foundation for a lifetime of learning. Requirements are structured to develop context – historical, cultural and geographic – for the study of nature and societies; the analytical tools and ability to reason; initiative and motivation to learn; and basic writing, quantification and problem-solving skills.

Because students will be living and working in a world where intercultural competence and technology will demand broad perspective and transferable habits of thought, Bucknell includes both independent and collaborative learning, as well as focused study in international and modern culture and issues, as cornerstones of the undergraduate experience. About 45 percent of each graduating class has studied abroad in approved programs in Europe, the Middle East, Africa, Asia, South and Central America, Australia, New Zealand and Canada.

Great Teaching and Other Assets

Notwithstanding the variety of intellectual commitments and practices represented at Bucknell, the faculty aspire to be great teachers universally and single-mindedly. They practice a most direct, energetic and committed form of pedagogy, one result of which is a rich variety of close intellectual encounters between faculty and their students. Undergraduate research is emphasized in all areas of the curriculum and it is made possible by the high level of the faculty's research and scholarship. Bucknell's faculty consists of 403 full-time members, 99 percent with the Ph.D. or another terminal degree.

The faculty's strong relations with students have much to do with Bucknell's extraordinary graduation rates – 86 percent within six years – that annually rank among the highest few in the nation. Employment and graduate school placement figures are also very high.

Bucknell's additional assets include a $1.16 billion endowment, total operating expenses of $288 million, and a network of more than 57,000 alumni throughout the nation and the world. The 450-acre campus is among the most attractive in the country; most of its more than 100 facilities are described later in the catalog. Of particular note are the highly regarded Ellen Clarke Bertrand Library (1951), the handsome Weis Center for the Performing Arts (1988), the capacious Rooke Science Center (1991), the Weis Music Building (2000), the Breakiron Engineering Building (2004), the LEED Silver-certified Academic West (2013), the LEED Silver-certified Hildreth-Mirza Hall (2018), the LEED Gold Certified Academic East (2019), and the LEED Gold Certified Holmes Hall (2021). In all, there are 14 LEED-certified buildings.

The University provides comprehensive residential and student activities programs to support the educational mission and to promote personal growth and responsibility. Eighty-nine percent of Bucknell students live on campus enjoying options that include eight residential colleges. Nearly 170 student organizations create a wide range of cocurricular and extracurricular opportunity in the arts, media, community service, religion and other areas. An active Greek system involves about 49 percent of the eligible (non-first-year) students.

Bucknell's athletics program is particularly rich and distinctive. Approximately one-fifth of all students participate in 27 varsity sports at the Division I level. Bucknell is a member of the Patriot League, whose member institutions share a commitment to the primacy of the academic experience. Bison Athletics has captured the Patriot League's all-sports championship in 18 of the 33 years contested. Bucknell annually ranks among the national leaders in student-athlete graduation rate and compiled an NCAA Graduation Success Rate of 98 percent in the most recent reporting.

The campus is bordered by the Susquehanna River and Lewisburg, a historic small town in scenic central Pennsylvania. Most of the mid-Atlantic region's major cities are within three or four-hour drives, including New York, Philadelphia, Baltimore, Pittsburgh and Washington, D.C., and the University uses their resources on a regular basis. Still, the day-to-day life of faculty and students is clearly nonurban and nonsuburban, and the walk from downtown to the University among stately 19th-century homes, in the light of the borough's signature street lamps, evokes the sense of an earlier, calmer America. Lewisburg also is ranked among the nation's "most livable" small towns on the basis of key resources such as health care, safety and the economic base.

Mission Statement

Bucknell is a unique national university where liberal arts and professional programs complement each other. Bucknell educates students for a lifetime of critical thinking and strong leadership characterized by continued intellectual exploration, creativity and imagination. A Bucknell education enables students to interact daily with faculty who exemplify a passion for learning and a dedication to teaching and scholarship. Bucknell fosters a residential, cocurricular environment in which students develop intellectual maturity, personal conviction and strength of character informed by a deep understanding of different cultures and diverse perspectives. Bucknell seeks to educate our students to serve the common good and to promote justice in ways sensitive to the moral and ethical dimensions of life.

Bucknell's rich history and heritage will influence its planning for the future. Bucknell's potential as an institution of higher learning extends beyond that of a traditional liberal arts college by virtue of its larger size and expansive programs. The University's broader spectrum of disciplines and courses of study within a diverse and active residential campus community enhance the quality of all aspects of the undergraduate experience, both in and out of the classroom.

Academic Calendar

Academic & Planning calendars (https://www.bucknell.edu/academic-planning-calendar/) can be found on the Bucknell University website.

Policy Statements

Bucknell University does not discriminate on the basis of race, color, national origin, sex, disability, religion, age, veteran status, gender identity, marital status, sexual orientation, gender expression, or any characteristic protected by law in its educational programs and activities, admissions or employment, as required by Title IX of the Educational Amendments of 1972, Title VI of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, Title VII of the Civil Rights Act of 1964, the Pennsylvania Human Relations Act, and other applicable laws and University policies.

In employment of both students and staff, Bucknell is an Affirmative Action and Equal Opportunity Employer. The Affirmative Action Officer, 14 Cooley Hall (570-577-1632), is the designated coordinator for compliance with Commonwealth and federal regulations and requirements. Bucknell has designated a Title IX coordinator, adopted and disseminated a nondiscrimination policy, and has put grievance procedures in place to address complaints of discrimination on the basis of sex in education programs and activities. The Title IX coordinator is located in Cooley Hall, Room 13, and can be reached at titleIX@bucknell.edu, 570-577-1554.

Certain academic programs operate with enrollment limits. Admission to the University, to a college, to a degree program, or to a major does not guarantee enrollment in any individual course, transfer from one college to another, or registration in any particular degree program or declaration of a particular major. Registration in or transfer from one degree program to another, or declaration of a major, is authorized only with the approval of the University consistent with University policy through the academic deans. The University reserves the right to cancel or limit enrollment in any individual course.

The contents of this *Catalog* do not establish a contract between a student or prospective student and Bucknell University. The University reserves the right to modify the requirements for admission and graduation and the contents of this catalog at any time; to amend any regulation or policy affecting the student body; and to dismiss from the University any student if it is deemed by the University to be in its best interest or in the best interest of the student. The University further reserves the right to modify course delivery methods or to close the campus in the interest of health and safety and/or to comply with government directives.

Accreditations

Bucknell University is accredited by the Middle States Commission on Higher Education, 1007 N. Orange St., 4th Floor, MB #166, Wilmington, DE 19801, https://www.msche.org (https://www.msche.org/). The Middle States Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Commission on Recognition of Postsecondary Accreditation.

In addition, Bucknell's bachelor of science programs in biomedical, chemical, civil, computer, electrical, environmental and mechanical engineering, and computer science and engineering are accredited by Engineering Accreditation Commission (EAC) of ABET, http://www.abet.org. ABET is a specialized accrediting agency recognized by the U.S. Department of Education and the Council for Higher Education Accreditation.

The Bachelor of Science in Computer Science program within the College of Arts & Sciences and the Bachelor of Science in Computer Science & Engineering program in the College of Engineering are accredited by the Computing Accreditation Commission (CAC) of ABET, http://www.abet.org. ABET is a specialized accrediting agency recognized by the U.S. Department of Education and the Council for Higher Education Accreditation.

The Bachelor of Science curriculum in chemistry is approved by the American Chemical Society, 1155 16th St., N.W., Washington, DC 20036, 800-227-5558.

The Department of Education certification programs are approved by the Pennsylvania Department of Education, 333 Market St., Harrisburg, PA 17101, 717-783-3750.

The Freeman College of Management is accredited by AACSB International – The Association to Advance Collegiate Schools of Business, 777 S. Harbour Island Blvd., Suite 750, Tampa, FL 33602, 813-769-6500.

Information in the Catalog was accurate as of January 2025.

Contacts

For more information on particular aspects of Bucknell University, contact the people listed below at the telephone number shown. To reach departments not on the list, call the main University number, 570-577-2000. All mail to Bucknell faculty and administrators should be addressed to:

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Dean of Students

Maureen "Moe" McGuinness, Associate Vice President & Fritz Family Dean of Students, 570-577-1601

Finance & Administration

Param Bedi, Vice President and Chief Operating Officer, 570-577-1557
Financial Services, 570-577-1138
Bursar Services, 570-577-3733

Financial Aid

Erin Wolfe, Director of Financial Aid, 570-577-1331

Registrar's Office

Tim Kracker, University Registrar, 570-577-1201

UNIVERSITY EDUCATIONAL GOALS

The goal of a Bucknell education is to transform students through rigorous and sustained academic study supported and enriched by cocurricular and residential experiences.

To that end, Bucknell University's students will:

1. Learn, integrate and apply knowledge and methodological approaches through in-depth study of an academic discipline.
2. Integrate and synthesize a range of knowledge, perspectives and creative methods acquired through study and practice across multiple academic disciplines and diverse educational experiences.
3. Develop knowledge and skills for interpreting the commonalities and differences among human societies, including diverse cultural perspectives and traditions within the United States and internationally, to enable living and working effectively in a global context.
4. Develop knowledge and skills to identify and respond creatively and effectively to local and global challenges to humans and the natural world.
5. Understand the importance of and develop the capacities for self-assessment, ethical reasoning and effective interaction with others so as to act responsibly and to promote justice in professional and communal life.
6. Develop critical thinking skills to evaluate arguments and address complex issues using techniques, including quantitative and qualitative analysis and scientific reasoning.
7. Develop skills in oral and written communication to articulate ideas and arguments clearly and effectively.
8. Develop information literacy and technological competency across disciplines.
9. Develop the desire and intellectual skills for lifelong learning.

COLLEGE OF ARTS & SCIENCES

The College of Arts & Sciences offers programs of study leading to four degrees: the Bachelor of Arts, the Bachelor of Science, the Bachelor of Science in Education and the Bachelor of Music. Faculty, staff and students in the college generate and disseminate knowledge in the arts, humanities, social sciences, natural sciences and mathematics affirming the liberal arts as the foundation for success in professional, personal and public endeavors.

The college fosters intellectual and ethical growth by providing a diverse, equitable and inclusive learning environment in which everyone can realize their full potential regardless of our differences.

Curricula Overview (AS)

The curricula of the college are primarily organized around the major disciplinary fields of inquiry traditionally recognized in the wider world of higher education, both in the United States and abroad. In each of its varied and diverse parts, the college offers challenging opportunities for general education and for intensive academic exploration, for breadth and for depth. Consequently, candidates for degrees in arts and sciences, regardless of the specific degree or major, are required to demonstrate high capability in general as well as in specialized study.

College of Arts & Sciences Core Curriculum (CASCC)

The curriculum of the College of Arts & Sciences is designed to give students the breadth of study necessary to be broadly educated citizens aware of a wide expanse of human knowledge and experience, and to help students discover and develop new interests and useful skills. In addition to broad exposure to ideas, the curriculum also requires students to spend part of their studies delving deeply into a particular area of study through the choice of a major.

The curriculum is centered on the ethos of the liberal arts. Through study in the College of Arts & Sciences, students will develop facility with tools such as writing, oral communication and information literacy. These skills will be developed through the study of academic disciplines that interpret, reflect and critique human experience, as well as learning of human knowledge about and human connection to natural phenomena. These disciplines will be studied individually and in reference to one another to provide students with a collection of intellectual and essential skills to understand and contribute to subjects both timeless and contemporary. Students will be prepared to appreciate the world we inhabit and, more significantly, be prepared to be responsible and engaged citizens of our interconnected world.

Within the structure of the curriculum, students will have latitude to determine their exact course of study with the support of faculty advising. Such latitude is inherent in the design of the curriculum so as to promote intellectual exploration and growth.

Components of the College of Arts & Sciences Core Curriculum (CASCC)

Foundational Experiences

- 1 Foundation Seminar
- 1 Integrated Perspectives Course
- 1 Foreign Language Course *
- 1 Lab Science Course *
- 1 Quantitative Reasoning Course *
- 1 Race, Power & Inequality Course *
- 1 Nature, People & Justice Course *
- 1 Global Connections Course *

Disciplinary Exploration

- 2 Natural Sciences & Mathematics Division Courses
- 2 Social Sciences Division Courses
- 4 Arts & Humanities Division Courses

Disciplinary Depth

- The Major(s)
- Academic Conventions of Writing, Speaking and Information Literacy
- Culminating Experience

* The foreign language; lab science; quantitative reasoning; Race, Power & Inequality; Nature, People & Justice; and Global Connections courses may double count in the Disciplinary Exploration section of the curriculum.

AP and IB credits may only be used to fulfill Disciplinary Exploration requirements. Credits transferred from other institutions may be used to fulfill CASCC requirements (Foundational Experiences or Disciplinary Exploration) only when approved by the appropriate department chair and/or the

director of the CASCC. Any course that fulfills a CASCC requirement may also count toward a major or minor or to fulfill the writing requirement. Courses satisfying major requirements may satisfy other requirements.

The following descriptions articulate the learning outcomes for each type of course within the components of the curriculum.

Foundational Experiences

The curriculum requires that all students take one course from each of the respective designations.

Foundation Seminar

(one writing-intensive W1 course, taken in the fall of the first year)

1. Students will develop writing, reading, speaking, listening and information literacy skills necessary for collegiate-level academic work.
2. Students will develop capacities for independent academic work and become more accountable for their own learning.

Integrated Perspectives Course

(one team-taught interdisciplinary course, taken during the sophomore or junior year, from the list of designated courses)

1. Students will recognize, construct and evaluate connections among different intellectual methods, ways of learning and bodies of knowledge.

Foreign Language Course *

(one course from the list of designated courses)

1. Students will study language as a complex multifunctional phenomenon – as a system for communicating thought and information and as an essential element of human thought processes, perceptions and self-expression – that allows students to understand different peoples and their communities.
2. Students will examine the world, their own culture and their own language through the lens of a foreign language and culture.

Lab Science Course *

(one course from the list of designated courses)

1. Students will develop a unified understanding of scientific theory and practice in modern natural science.
2. Students will demonstrate an understanding of the development of science as an intellectual pursuit and of the ways in which scientific ideas are formulated, modified and come to be accepted.
3. Students will demonstrate skill in the application of scientific techniques and methods, including the collection, analysis and interpretation of data, and communication of results.

Quantitative Reasoning Course *

(one course from the list of designated courses)

1a. Students will demonstrate college-level knowledge of a body of mathematical and/or statistical techniques suitable for modeling and analyzing real world questions/situations, and will gain some experience in such modeling, including experience in building, describing, testing, analyzing and making predictions from such models.

OR

1b. Based on a focused course experience, students will apply basic mathematical and/or statistical techniques at a college level of sophistication in the analysis and modeling of real-world questions or problems, including experience in building, describing, testing, analyzing and making predictions from such models.

AND

2. Students will formulate questions and propositions for quantitative analysis, translate the question into a form appropriate for the chosen quantitative model, and interpret and evaluate the results of the model in ways meaningful to the problem at hand. Students will demonstrate the ability to assess the validity and limitations of quantitative models and an understanding of the role of the assumptions made in the construction of these models.

Race, Power and Inequality Course *

(one course from the list of designated courses)

1. Students will acquire contextualized knowledge about the processes (historical, social, political, etc.) by which different forms of power and privilege construct, maintain and enforce structural oppression related to race and identity.

2. Students will acquire the vocabulary and analytical tools necessary to examine critically the disproportionate impact of structural inequality on marginalized peoples and communities.
3. Students will use concepts and methodologies from at least one discipline or interdisciplinary field to interrogate complex interrelationships between individuals, groups and power structures, especially as they have manifested and been contested over time.

Nature, People and Justice Course *

(one course from the list of designated courses)

1. Students will acquire contextualized knowledge about the processes (historical, ecological, biophysical, geological, social, political, economic, cultural, etc.) that have produced significant disruptions to the structures and functions of environmental systems that support life.
2. Students will use concepts and methodologies from at least one discipline or interdisciplinary field to critically examine the consequences of environmental change.
3. Students will reflect critically on their roles – both as individuals and as members of society – in producing, mitigating and adapting to significant disruptions in human-environmental systems, and identify potential courses of action necessary to create a more just and equitable world.

Global Connections

(one course from the list of designated courses)

1. Students will use concepts and tools of inquiry to examine the beliefs, history, social experiences, social structures, artistic or literary expressions, and/or traditions of one or more cultures or societies located outside the United States.

OR

2. Students will use appropriate tools of inquiry to understand the interdependent nature of the global system and the consequences this interdependence has for political, economic and social problems.

Disciplinary Exploration

The curriculum requires that all students take the following number of courses from the respective divisions of the College of Arts & Sciences. Collectively, disciplinary exploration is intended to give students wide exposure to the breadth of study across the span of disciplines represented in the College of Arts & Sciences. The assignment of divisional designation will be determined by the divisional designation of the instructor teaching the course.

2 Natural Sciences & Mathematics Division Courses
2 Social Sciences Division Courses
4 Arts & Humanities Division Courses

Disciplinary Depth

The Major(s)

The disciplinary depth component of the curriculum provides students with the opportunity for sustained study in an academic discipline. Students learn to think deeply about a set of linked topics and to use the methodology of academic investigation in a specific field or a set of subfields. As a result, they extend and develop their own intellectual ideas with more sophisticated and informed analysis. They acquire the intellectual confidence that comes from mastery of a body of knowledge and develop the skills to apply their learning beyond their coursework.

The academic major provides students with a framework for such focused disciplinary study. Through a set of linked courses, students develop expertise in their discipline. Students in major courses have common academic backgrounds, and therefore upper-level major courses can address academic material at a sophisticated level.

Intellectual Competencies That Are Incorporated in the Major

The college faculty has identified writing, speaking and information literacy as essential intellectual abilities that need to be mastered by competent graduates. These skills are interdisciplinary, and students will have multiple opportunities to practice and improve them in many settings over their four-year education. However, in-depth and discipline-specific study affords students an opportunity to practice these skills at a high level; therefore, every major incorporates intellectual skills-development into required coursework.

1. Students will develop their writing abilities through coursework in the University Writing Program, which requires that students take a minimum of three writing courses (two of which are linked to writing in particular disciplines). Courses in the major will allow students to apply their writing ability to address and investigate issues at a more sophisticated level due to their mastery of the subject matter.

2. Students will develop skills in formal presentation at a level reasonable for a college graduate in the particular major. Ways in which this skill can be obtained and practiced include but are not restricted to: a course with student presentations, honors thesis defense, talk in a student colloquium series, presentation at a conference, or presentation of significant course projects.
3. Students have achieved basic competency in finding, analyzing, evaluating and effectively using various sources of information in the foundation seminar and other courses. Courses in the major will build on these skills and introduce students to field-specific information retrieval techniques and to critical evaluation of content as customary in the field.

Information Literacy:

1. Students will determine and articulate a need for information, be able to frame the research question, and select resources appropriate to specific research needs;
2. Students will construct and refine search strategies to locate, access and retrieve information efficiently;
3. Students will critically evaluate resources and content, and understand the legal and ethical standards of information access and use;
4. Students will use technology effectively to organize, communicate and present information to support academic work.

Culminating Experience

In addition to completing a body of specialized coursework, students in each major will complete an approved Culminating Experience, usually in their senior year. Second-semester juniors may complete a Culminating Experience in a major with permission of the adviser and the department chair or program coordinator. The successful Culminating Experience will draw together a student's disciplinary experiences and provide a more coherent appreciation of the major's academic discipline. The structure of the Culminating Experience is left to the discretion of the faculty in the department or program offering the major (subject to the review of the Arts & Sciences Curriculum Committee). Types of Culminating Experiences will vary by major, but they may include a senior seminar, interdisciplinary course, independent study project, community-engaged learning, or an honors thesis.

Bachelor of Arts Majors

The Bachelor of Arts degree program provides both a minimal and a maximum number of courses to be studied in the major. Accordingly, in addition to meeting the College of Arts & Sciences Core Curriculum (CASCC) requirements and objectives, the student is encouraged and has ample opportunity to pursue electives that will supplement and further broaden their educational experience.

The end and aim of such an extended and extensive education in the College of Arts & Sciences is the development and orientation of an intelligent and responsible individual. Broad-based studies are the starting point and constant preoccupation of students who are committed to the belief that knowledge is important for its own sake and that the pursuit of excellence is worth all the work that it requires. After college, students who have elected a Bachelor of Arts degree may discover great practical advantage, for they have laid the foundation for an understanding of their cultural heritage, of the contemporary world, of the hierarchy of values and of themselves. They also have learned much about their own abilities, strengths and limitations.

For the student who has professional ambitions and therefore faces the prospect of spending from three to six years in specialized graduate study, the College of Arts & Sciences curriculum is invaluable. Graduate schools as well as training programs in industry are coming to expect a liberal education as a qualification for admission.

Liberal education is not incompatible with specialization. It is liberal education that gives a broader usefulness to specialization. Graduate and professional schools and employment training programs expect that specialized instruction be based on a liberal foundation. Because it establishes the conditions for development of an individual's potential, such a foundation becomes a means of achieving a higher degree of professional and technical competency. It stabilizes the balance of judgment and supports the resourcefulness and the creativity of the specialist.

The process of attaining the Bachelor of Arts degree serves in achieving the goals of a liberal education. Each student who is a candidate for this degree, with the assistance of a faculty adviser, is required to plan a personal program of study. It is obvious that the planning of such a program is itself a task of considerable difficulty and that it may well be the most demanding responsibility a student must face. When it is wisely carried out, it will represent a major achievement of the undergraduate years.

The major will be declared during the second semester of the sophomore year.

The Established Departmental & Interdepartmental Majors

Students who wish to pursue a major in a discipline can do so by selecting from among many established programs. Students select a major during the fourth semester of study, at which time the program of study is established in consultation with an academic adviser and approved by the department or interdepartmental program chair concerned. A major normally requires a minimum of eight courses. Students may elect to undertake a double major, which entails meeting all obligations of each of the two fields selected.

Maximum Concentration

Within the 32 courses required for the Bachelor of Arts degree, a maximum of 12 courses may be taken in a single department. However, this 12-course limit does not apply per se to the following departments: art & art history; classics & ancient Mediterranean studies; English; languages, cultures & linguistics; sociology & anthropology; or theatre & dance. In these departments, the limit applies to each of the programs in which a major is offered.

In rare instances, a student may submit a petition through their faculty adviser and department chair to the associate dean of the College of Arts & Sciences requesting an exception to the 12-course limit. This right of petition is to be exercised only when there is a profound need and the student has satisfactorily demonstrated the pursuit of a broad, liberal education. Evidence of such pursuit should include the use of elective courses, which go beyond the minimal requirements, to more fully realize the disciplinary breadth and the broadened perspective objectives (as noted in the discussion of those requirements). The petition must be recommended by a faculty adviser and endorsed by the student's department chair.

Bachelor of Science and the Professional Degree Majors

The Bachelor of Science and the professional degree programs require and permit greater specialization. Each of these programs has more extensive major and major-related requirements than do comparable majors in the Bachelor of Arts degree program. Unlike the Bachelor of Arts degree, each of these degree programs does not limit the number of electives that may be taken in the major beyond the minimal requirements.

Natural Sciences & Mathematics

The Bachelor of Science curricula are offered for those who seek an education founded upon the sciences but including instruction in the humanities and social sciences. These curricula, based on the requisites of scientific knowledge, provide a thorough preparation in the field of the student's major interest without neglecting complementary study in other areas. After completing one of these curricula, the student is qualified to pursue graduate or professional studies or to enter research positions in industry. Bachelor of Science students generally enter Bucknell having already selected a major.

The College of Arts & Sciences offers Bachelor of Science majors in animal behavior, applied mathematical sciences, biology, biophysics, cell biology/biochemistry, chemistry, computer science, geosciences, mathematical economics, mathematics, neuroscience, statistics and physics.

Professional Degree Programs

The Bachelor of Science in Education (B.S. Ed.) and Bachelor of Music (B.Mus.) programs provide professional development that is strongly grounded in the larger context of a liberal education. Students in these programs, like those in the Bachelor of Science programs described above, devote a larger proportion of their studies to the major than candidates for the Bachelor of Arts degree.

The B.S. Ed. degree leads to certification in early childhood education (Pre-K-4). The B.Mus. program offers majors in vocal performance or music education.

Pre-Health Professions Preparation

The coursework for admission into the various graduate programs in the health sciences may be completed through work toward either a Bachelor of Arts or a Bachelor of Science degree with a major in practically any department. Most graduate programs require a minimum of undergraduate work equivalent to one year each in biology, inorganic chemistry, organic chemistry, physics and mathematics; however, requirements vary both by discipline and by program within a discipline. Students planning for such careers should consult the catalogs of the schools of their choice for specific requirements and suggested courses and register with the pre-health professions adviser as soon as possible after enrollment in Bucknell.

Integrated B.S./M.S. Degrees

Undergraduate students who have completed three years at Bucknell with a cumulative grade point average of at least 2.80 and who show aptitude for graduate study may apply for admission to the integrated Bachelor of Science/Master of Science degree program available in the departments of chemistry or mathematics. This program permits selected students to complete all requirements for both degrees in five years.

Writing Competency

To satisfy the University writing requirement, a student must successfully complete three writing courses: one course designated W1 (which must be taken during the first year and must be taken before the W2 courses) and two W2 courses (usually taken after the first year, but, in any case, at least one of which must be taken after the first year). Lists of W1 and W2 courses are available from the registrar's office webpage under Course Information (http://www.bucknell.edu/CourseInformation/).

Writing courses are designed to enhance the student's understanding of the writing process and to emphasize that writing is a way of learning as well as a communication skill. They may be taken in any department, including the student's major.

Optional Minors (AS)

Minors are optional on the part of faculty and students; no department or group of faculty members is required to offer a minor and no student can be required to elect a minor.

Pursuit of a minor, whether departmental or interdisciplinary, may provide a student with more coherence and focus in choosing electives. This may well enhance the educational experience, particularly when the minor is chosen from a division other than that of the major or when the minor is interdisciplinary.

Optional minors are available to regular undergraduate students in each of the areas listed below. Details of the requirements for each minor are listed on the indicated pages.

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More information on minors is available under Academic Standards & Policies (p. 451).

Areas of Study (AS)

African Studies Minor

Faculty

Co-coordinators: Cymone Fourshey, Michelle C. Johnson

The interdepartmental African studies minor gives an understanding of Africa's rich histories, diversity and role in the world today, and contributes an international focus to a liberal arts education. It consists of five courses chosen from the list below. Students must take at least three core courses, and they must choose two other courses from the list below. If possible, at least one course should be related to the student's major. In consultation with the coordinators of the minor, students may include an Africa-related course from the African-American or Caribbean studies list. In general, there are no prerequisites for the courses on the African studies minor list.

Core Courses:

ANTH 329	Religions in Africa: Spirits, Saints, and Sufis	1
ECON 224	African Women & Social Action	1
ECON 235	African Economic Development	1
ECON 270/UNIV 284	South Africa: Social Entrepreneurship	1
ENCW 112	Writing Fiction: Black Writers	1
ENCW 312	Black Sci-Fi Workshop	1
ENST/CBST 263	Conservation in Africa	1
FOUN 098	Foundation Seminar (South Africa)	1
FREN 336	Francophone Worlds	1
HIST/CBST/IREL 274	Africa and International Relations in Historical Perspective	1
HIST 275	Race and Colonial Regimes in Africa	1
HIST 276/IREL 271	Popular Culture in Africa	1
HIST 277/IREL 273/WMST 277	Gender in Africa	1
HIST 291	Africa: Ancient to Early Modern Times 4000BCE-1400CE	1
HIST 292	Making Contemporary Africa: 'Early Modern' to the 'Post-Modern' World - 1400 to the Present	1
UNIV 200	Integrated Perspectives Course (Africa and the Media)	1

Other African Studies Course:

HIST 290	Europe Imperialism and Colonialism	1

Courses taken in semester-long or yearlong programs in Africa may count toward the minor.

Animal Behavior

Faculty

Professors: Morgan Benowitz-Fredericks (Director, BIOL), Elizabeth A. Capaldi (BIOL, ANBE), Kevin P. Myers (PSYC), DeeAnn M. Reeder (BIOL)

Associate Professors: Regina P. Gazes (PSYC, ANBE), Sarah E. Lower (BIOL), Mizuki Takahashi (BIOL, ANBE)

Assistant Professor: Natalie Schwob (PSYC, ANBE)

The program in animal behavior offers an interdisciplinary major that focuses on subject matter in biology and psychology, with room for more depth in chemistry, mathematics and physics. The focus is directed toward understanding behavior and providing the student with a background uniting ecological, ethological, environmental, evolutionary, experimental and physiological approaches to the study of animal life.

During the more than 50 years that Bucknell University has offered this major, animal behavior has been chosen by students seeking a broad background in the natural and social sciences; by those who become researchers; as a background for medical or veterinary science; and, because of the breadth of requirements, by persons filling a variety of positions in commerce, law and public service.

The major may be pursued under either the bachelor of arts or the bachelor of science programs. The bachelor of science differs chiefly in the number of additional advanced science and laboratory courses. All students are encouraged to seek research experiences in the laboratory or field in addition to required coursework. The Bucknell research laboratories, as well as opportunities abroad, are well suited to complement the student's education.

Animal behavior majors will fulfill the Culminating Experience requirement by taking ANBE 320 Advanced Topics in Animal Behavior in their senior year. The course is open only to senior animal behavior majors and is designed to explore diverse areas and concepts in animal behavior that are particularly relevant to a student graduating with a degree in animal behavior. The course encourages majors to reflect on what they learned over the years and to look to the future for emerging ideas within the field.

Information literacy, formal presentation and writing goals within the major will be fulfilled when students take ANBE 296 Advanced Methods in Animal Behavior/PSYC 296 Advanced Methods in Animal Behavior and ANBE 320 Advanced Topics in Animal Behavior. In ANBE 296 Advanced Methods in Animal Behavior/PSYC 296 Advanced Methods in Animal Behavior, students conduct experimental research, present their work to the class in a conference-style session, and write their research as a journal-style publication. In so doing, they search the literature to find sources that provide a theoretical basis for their study, develop the hypotheses tested, and instruct the design of their study. In ANBE 320 Advanced Topics in Animal

Behavior, students will develop more theoretical and conceptual writing skills by conducting literature searches on topics in animal behavior and synthesizing the material into a review-style paper. Students will present the results of their literature reviews to the class and lead class discussions on selected topics, also enhancing their presentation skills. Although information literacy, formal presentation, and writing goals within the major will be specifically addressed in ANBE 296 Advanced Methods in Animal Behavior/PSYC 296 Advanced Methods in Animal Behavior and ANBE 320 Advanced Topics in Animal Behavior, majors will receive similar training in these skills in many other courses they take as electives and requirements within the major.

Bachelor of Arts

The **Bachelor of Arts major** consists of the following 11 required courses.

Animal Behavior core course		
ANBE/BIOL/PSYC 266	Animal Behavior	1
Applied Research Methods in Animal Behavior		
ANBE/PSYC 296	Advanced Methods in Animal Behavior	1
Biology core courses		
BIOL 201	Biological Inquiries and Observations	1
or BIOL 202	Course-based Undergraduate Research Experience	
BIOL 203	Integrated Concepts in Biology Fall	1
BIOL 204	Integrated Concepts in Biology Spring	1
Psychology core requirements		
PSYC 203	Learning	1
PSYC 250	Biopsychology	1
Statistics requirement		
PSYC 215	Psychological Statistics	1
or MATH 216	Statistics I	
Upper-level animal behavior electives [1]		
Select two of the following:		2
ANBE/BIOL 305	Vertebrate Ecology- with Lab	
ANBE/BIOL 307	Conservation Genetics	
ANBE/BIOL 309	Wildlife and Emerging Diseases	
ANBE/BIOL 312	Comparative Vertebrate Anatomy	
ANBE/BIOL 313	Mammalogy	
ANBE/BIOL 314	Amphibian Biology and Conservation	
ANBE/BIOL 318	Principles of Physiology	
ANBE 319	Topics in Animal Behavior	
ANBE/BIOL 321	Behavioral Ecology	
ANBE/BIOL 325	Evolutionary Genomics	
ANBE/BIOL 328	Endocrinology	
ANBE/BIOL 341	Evolution	
ANBE/BIOL 342	Neuroethology	
ANBE/BIOL 353	Ecosystem Ecology	
ANBE/BIOL 354	Tropical Ecology	
ANBE/BIOL 355	Social Insects	
ANBE/BIOL 357	Ornithology	
ANBE/BIOL 358	Invertebrate Zoology	
ANBE/BIOL/PSYC 370	Primatology	
ANBE/PSYC 371	Primate Minds	
ANBE/PSYC 372	Comparative Cognition	
ANBE/BIOL 382	Mass Extinctions	
BIOL 324	Neurophysiology	
BIOL 329	Foundations of Genetics	
PSYC 324	Advanced Psychological Statistics	

Culminating Experience requirement		
ANBE 320	Advanced Topics in Animal Behavior	1

[1] Cross-listed courses are indicated. With special permission, other upper-level PSYC/BIOL courses may be considered as electives.

Bachelor of Science

The **Bachelor of Science major** consists of the following 17 required courses:

Animal Behavior core course		
ANBE/BIOL/PSYC 266	Animal Behavior	1
Applied Research Methods in Animal Behavior		
ANBE/PSYC 296	Advanced Methods in Animal Behavior	1
PSYC 290	Advanced Methods in Biopsychology	1
or PSYC 293	Advanced Methods in Learning	
Quantitative requirements [1]		
Select two of the following:		2
BIOL 364	Advanced Data Analysis in Biology	
CSCI 203	Introduction to Computer Science	
CSCI 204	Data Structures & Algorithms	
GEOG 204	Applied G.I.S.	
MATH 201	Calculus I	
MATH 202	Calculus II	
MATH 211	Calculus III	
MATH 217	Statistics II	
MATH 219	Topics in Applied Mathematics	
PHYS 211	Classical and Modern Physics I	
PHYS 212	Classical and Modern Physics II	
PSYC 324	Advanced Psychological Statistics	
Biology core courses		
BIOL 201	Biological Inquiries and Observations	1
BIOL 202	Course-based Undergraduate Research Experience	1
BIOL 203	Integrated Concepts in Biology Fall	1
BIOL 204	Integrated Concepts in Biology Spring	1
Psychology core requirements		
PSYC 203	Learning	1
PSYC 250	Biopsychology	1
Statistics requirement		
MATH 216	Statistics I	1
or PSYC 215	Psychological Statistics	
Chemistry requirement		
CHEM 205	Principles of Chemistry	1
Upper-level animal behavior electives [2]		
Select three of the following:		3
ANBE/BIOL 305	Vertebrate Ecology- with Lab	
ANBE/BIOL 307	Conservation Genetics	
ANBE/BIOL 309	Wildlife and Emerging Diseases	
ANBE/BIOL 312	Comparative Vertebrate Anatomy	
ANBE/BIOL 313	Mammalogy	
ANBE/BIOL 314	Amphibian Biology and Conservation	
ANBE/BIOL 318	Principles of Physiology	
ANBE 319	Topics in Animal Behavior	
ANBE/BIOL 321	Behavioral Ecology	

ANBE/BIOL 325	Evolutionary Genomics	
ANBE/BIOL 328	Endocrinology	
ANBE/BIOL 341	Evolution	
ANBE/BIOL 342	Neuroethology	
ANBE/BIOL 353	Ecosystem Ecology	
ANBE/BIOL 354	Tropical Ecology	
ANBE/BIOL 355	Social Insects	
ANBE/BIOL 357	Ornithology	
ANBE/BIOL 358	Invertebrate Zoology	
ANBE/BIOL/PSYC 370	Primatology	
ANBE/PSYC 371	Primate Minds	
ANBE/PSYC 372	Comparative Cognition	
ANBE/BIOL 382	Mass Extinctions	
BIOL 324	Neurophysiology	
BIOL 329	Foundations of Genetics	
PSYC 324	Advanced Psychological Statistics [3]	
Culminating Experience requirement		
ANBE 320	Advanced Topics in Animal Behavior	1
Total Credits		**17**

1 Other quantitative-based courses may be approved with special permission.
2 Cross-listed courses are indicated. With special permission, other upper-level PSYC/BIOL courses may be considered as electives.
3 PSYC 324 may not be counted as a 300-level elective if it is used to satisfy the quantitative requirement.

The recommended sequence for the Bachelor of Science major is as follows:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ANBE 266	1	BIOL 201 or 202	1
BIOL 201 or 202	1	PSYC 215 or MATH 216	1
	2		**2**
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
BIOL 203	1	BIOL 204	1
CHEM 205	1	PSYC 203 or 250	1
PSYC 250 or 296	1		
	3		**2**
Junior			
First Semester	**Credits**	**Second Semester**	**Credits**
Animal behavior elective	1	Animal behavior elective	1
PSYC 203 or 250	1	PSYC 290 or 293	1
	2		**2**
Senior			
First Semester	**Credits**	**Second Semester**	**Credits**
ANBE 320	1	Animal behavior elective	1
Quantitative elective	1	Quantitative elective	1
	2		**2**

Total Credits: 17

Students are advised to take the first two biology core courses in any order during their first year (BIOL 201 Biological Inquiries and Observations and BIOL 202 Course-based Undergraduate Research Experience). Students are advised to take BIOL 203 Integrated Concepts in Biology Fall and BIOL 204 Integrated Concepts in Biology Spring in sequence during their second year. BIOL 203 and BIOL 204 serve as prerequisites for most of the 300-level

elective courses. Note that one semester of independent research (ANBE 391 Research) or honors credit (ANBE 399 Senior Thesis) may count toward the upper-level electives for the BA or BS.

Off-campus study and research are encouraged. Recent students have studied in Africa, Australia, New Zealand and Ecuador. Other programs in Europe, Asia, South and Central America are also appropriate. Students are advised to explore opportunities through The Office of Global and Off-campus Education (OGOE) and to coordinate off-campus coursework in consultation with a faculty adviser. Many minors complement studies in animal behavior and students are encouraged to explore options within the humanities and social sciences in consultation with a faculty adviser.

Majors in Animal Behavior will:

1. Understand evolutionary theory as a unifying construct that brings together teachings of many diverse disciplines.
2. Understand the proximate and ultimate bases for behavior (how and why animals behave as they do).
3. Understand the process through which scientific information is derived, evaluated and communicated.

Courses

ANBE 266. Animal Behavior. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A survey of important theories, issues, and empirical techniques in the interdisciplinary field of animal behavior emphasizing both proximate and ultimate mechanisms and explanations for behavior. Crosslisted as BIOL 266 and PSYC 266.

ANBE 291. Directed Study in Animal Behavior. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
An entry into animal behavior research or other independent study directed by a faculty member. Experiences might include library work, collecting data, hands on experiences, entering and analyzing data, and other activities associated with engagement in research, animal management, and faculty-directed inquiry. Prerequisite: Instructor permission.

ANBE 296. Advanced Methods in Animal Behavior. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; May require dissection or live animal experimentation
Laboratory and/or field research to accompany ANBE 266, BIOL 266, or PSYC 266. Prerequisites: (MATH 216 or PSYC 215) and (BIOL 201 or BIOL 202 or BIOL 203 or BIOL 204 or PSYC 216) and prerequisite or corequisite (ANBE 266 or BIOL 266 or PSYC 266). Crosslisted as PSYC 296.

ANBE 2NT. Animal Behavior Non-traditional Study. .5-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Non-traditional course in Animal Behavior. Prerequisite: permission of the instructor.

ANBE 303. Vertebrate Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Vertebrate ecology explores how vertebrates interact with their physical environment from individual to global scales. We will overview the major clades of vertebrates, including a discussion about how environments in which they live shapes their anatomy, physiology and behavior. We will also cover population dynamics and community structures. Prerequisites: (BIOL 203 and BIOL 204) or (ANBE/BIOL/PSYC 266) and instructor permission. Crosslisted as ANBE 603, BIOL 303 and BIOL 603.

ANBE 305. Vertebrate Ecology- with Lab. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
An upper-level laboratory course covering topics in Vertebrate Animal Ecology. Subfields of ecology to be determined by the instructor. Prerequisites: (BIOL 203 and BIOL 204) or (ANBE 266/BIOL 266/PSYC 266) and permission of the instructor. Crosslisted as ANBE 605, BIOL 305 and BIOL 605.

ANBE 307. Conservation Genetics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
As biodiversity has quickly eroded for the past few centuries, some scientists argue that humans are causing the 6th mass extinction event. This course emphasizes the application of population genetics, molecular phylogenetics, and reproductive genetics to answering biological questions in wildlife conservation. Prerequisites: (BIOL 203 and BIOL 204) or (BIOL 207 and BIOL 208). Crosslisted as ANBE 607 and BIOL 307 and BIOL 607.

ANBE 309. Wildlife and Emerging Diseases. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Biology of wildlife diseases, especially zoonoses (infections that jump to humans). Course will integrate popular and scientific sources. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 609, BIOL 309 and BIOL 609.

ANBE 312. Comparative Vertebrate Anatomy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Gross morphology with emphasis on functional and evolutionary modifications of animal structure. Gross dissection and techniques used in morphology. Prerequisites: BIOL 122 or (BIOL 203 and BIOL 204) and permission of the instructor. Crosslisted as ANBE 612, BIOL 312 and BIOL 612.

ANBE 313. Mammalogy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Biology of mammals, including evolution, classification, biodiversity, behavior, anatomy, physiology, ecology and conservation. Lab will include specimen identification, preparation and field studies. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 613, BIOL 313 and BIOL 613.

ANBE 314. Amphibian Biology and Conservation. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3
The biology of amphibians, including classification, physiology, reproduction, ecology, evolution, and conservation. Laboratory section will include identification of amphibians and field work to identify conservation issues surrounding local amphibian populations. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 314 and BIOL 614 and ANBE 614.

ANBE 318. Principles of Physiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Emphasizes the breadth of physiology and explores physiological principles of animals from a cellular, organismal, medical and ecological framework. Laboratory focuses on experimental design and independent research. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 618, BIOL 318 and BIOL 618.

ANBE 319. Topics in Animal Behavior. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Occasional seminars on selected topics of current interest in animal behavior. Prerequisites: (BIOL 203 and BIOL 204) or (ANBE 266 or BIOL 266 or PSYC 266), junior or senior status and permission of the instructor. Crosslisted as ANBE 619.

ANBE 320. Advanced Topics in Animal Behavior. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Culminating Experience seminar for senior animal behavior majors covering selected topics of current interest in animal behavior. Prerequisites: open to seniors in animal behavior and 4 or 5-year engineers. Permission of the instructor.

ANBE 321. Behavioral Ecology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
How have ecological selection pressures (generated by animals' biotic and abiotic environments) shaped the fascinating diversity of animal behaviors? Topics include habitat choice, foraging behavior, defenses against predation, cooperation and competition, sexual selection, and parental care. Heavy emphasis on primary literature and experimental design. Crosslisted as ANBE 621, BIOL 321 and BIOL 621.

ANBE 325. Evolutionary Genomics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
An exploration of evolutionary questions using large sequencing databases, with an emphasis on developing strategies for computational sequence analysis. Includes review of the primary literature. No coding experience. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 625, BIOL 325 and BIOL 625.

ANBE 328. Endocrinology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Problem Session:2
Regulation and function of hormones and their receptors from molecular to organismal levels. Role of hormones in development, physiology, and behavior; endocrine disease. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 628, BIOL 328 and BIOL 628.

ANBE 341. Evolution. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of evolutionary processes, phenomena, and mechanisms. Topics covered may include natural selection, sexual selection, adaptation, evolutionary constraints, speciation, evolution and development, coevolution, behavioral evolution, and macroevolution. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 641 and BIOL 341 and BIOL 641.

ANBE 342. Neuroethology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A course that integrates neurobiology and behavior in natural contexts. Emphasis on signal detection, recognition, discrimination, localization, orientation, and the control of complex acts. Neuronal and hormonal mechanisms, ontogeny and evolution of behavior will be considered. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 642 and BIOL 342 and BIOL 642.

ANBE 353. Ecosystem Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Interactions between organisms and the physical and chemical environment including nutrient cycling and energy flow, biogeochemistry, and temporal and spatial dynamics of ecosystems. Prerequisites: (BIOL 203 and BIOL 204) or ENST 208, junior or senior status, and permission of the instructor. Crosslisted as ANBE 653, BIOL 353, BIOL 653, ENST 353.

ANBE 354. Tropical Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to tropical ecology including life history strategies of vertebrates and invertebrates, biodiversity management and conservation. Emphasis on class and individual projects, data collection and journal keeping. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 654 and BIOL 354 and BIOL 654.

ANBE 355. Social Insects. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3; May require dissection or live animal experimentation
Evolution and genetics of social behavior, caste, communication in foraging and colony defense, queen and worker control over reproduction, social homeostasis, and population dynamics. Occasionally may be taught as a laboratory science. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 355.

ANBE 357. Ornithology. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
The biology of birds, including evolution, behavior, anatomy, physiology, ecology, and conservation; lab trips focus on identification of birds in the field. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 657 and BIOL 357 and BIOL 657.

ANBE 358. Invertebrate Zoology. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3,Other:3
A survey of the animal phyla covering phylogenetic relationships, functional morphology, ecology, life histories, symbiosis, ontogeny and behavior. Includes hands-on study of organisms in lab and field. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 658, BIOL 358 and BIOL 658.

ANBE 364. Advanced Data Analysis in Biology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:3
Data exploration and visualization using state-of-the-art computational techniques. Using “big data” from their own research projects or public transcriptomic datasets, students will learn to analyze/visualize complex biological datasets. Lab includes hands-on work with R/virtual reality. No prior programming experience required. Prerequisites: BIOL 203 and BIOL 204 and MATH 216 and permission of the instructor. Crosslisted as ANBE 664, BIOL 364 and BIOL 664.

ANBE 370. Primatology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; May require dissection or live animal experimentation
Introduction to research on prosimians, monkeys and apes with emphasis on the evolutionary origin of diversity, habitat use, social structure, social behavior, cognitive abilities and management. Prerequisites: (ANBE 266 or BIOL 266 or PSYC 266) or (BIOL 203 and BIOL 204) and permission of the instructor. Crosslisted as ANBE 670 and BIOL 370 and BIOL 670 and PSYC 370 and PSYC 670.

ANBE 371. Primate Minds. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An investigation into the cognitive abilities and capacities of nonhuman primates emphasizing a comparative perspective. Prerequisites: PSYC 216 or (ANBE 296 or PSYC 296) or permission of the instructor. Crosslisted as ANBE 671,PSYC 371 and PSYC 671.

ANBE 372. Comparative Cognition. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Advanced seminar exploring cognition and behavior from evolutionary and comparative perspectives. Topics will include social behavior, memory, communication, spatial cognition, learning, and meta-cognition. Prerequisite: (ANBE 266 or BIOL 266 or PSYC 266) or (PSYC 203 or PSYC 204). Crosslisted as ANBE 672 and PSYC 372 and PSYC 672.

ANBE 376. Animal Nutrition. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the science of nutrition, emphasizing biochemical, physiological and metabolic processes. We’ll examine physiological properties of macronutrients, assess health impacts of popular diets and discuss the physiological role of micronutrients. While touching on human health, the focus will be general principles of nutrition that apply to all animals. Prerequisites: BIOL 203 and BIOL 204 and permission of instructor. Crosslisted as ANBE 676, BIOL 376 and BIOL 676.

ANBE 380. SciComm: Communicating Science to Non-Scientists. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Seminar covering effective strategies for communicating science to a non-scientific audience. We will use an active community-based approach to gain hands-on experience developing, implementing, and disseminating scientific information to the public. This course is open to all upper level natural science majors. Crosslisted as ANBE 681.

ANBE 382. Mass Extinctions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An upper-level course investigates the past five mass extinctions and the on-going sixth mass extinction of organisms from the perspective of ecology, evolution and conservation biology. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 682, BIOL 382 and BIOL 682.

ANBE 391. Research. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies; Repeatable; May require dissection or live animal experimentation
Independent research, with faculty supervision, in the study of animal behavior. Crosslisted as ANBE 691. Prerequisite: permission of the instructor.

ANBE 399. Senior Thesis. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:2,Other:10; Repeatable; May require dissection or live animal experimentation
Original research leading to a thesis presentation on a topic related to the study of animal behavior. Prerequisite: permission of the instructor.

ANBE 3NT. Animal Behavior Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in Animal Behavior. Prerequisite: permission of the instructor.

Anthropology

Faculty

Chair: Elizabeth Durden

Professors: Coralynn V. Davis, Michelle C. Johnson (Associate Dean of Social Sciences), Edmund Searles

Associate Professors: Susan A. Reed, Clare Sammells, Allen L. Tran

Visiting Assistant Professor: Jonathan Scholnick

The department encompasses two disciplines, sociology and anthropology, and offers separate majors and minors in each.

Cultural anthropology explores the basis of and implications for human diversity by posing general and specific questions about the varieties of human experience. The study of human diversity contributes essential elements to a liberal arts education.

The aim of the anthropology major is to introduce students to the theories and methods anthropologists use to study and analyze different cultures around the world. Instruction is offered on various topical issues (e.g., the anthropology of economics, religion, medicine and emotions), and on the ways anthropologists research problems that are both practical and intellectual in nature. Students may pursue graduate work in anthropology, but a major in anthropology furnishes skills and conceptual tools useful in a wide variety of paths.

We encourage anthropology majors to include original research and off-campus experiences in their program of study. We make field research a required component in several of our courses and we encourage students to take anthropology courses in off-campus study programs in the U.S. and abroad. We encourage students interested in off-campus field research to take research methods courses beginning in their second or third year at Bucknell, although seniors with no prior experience are usually admitted to field study courses.

Honors

The department strongly encourages qualified majors to consider working for honors in anthropology. Such students should consult with one or more members of the faculty of the department to begin defining a research topic and writing a proposal **in their junior year.** Normally, during the senior year an honors student will enroll in ANTH 319 Honors Course in Anthropology and, if agreed to by the academic adviser, a second semester in ANTH 320 Honors Course in Anthropology. The honors proposal is to be approved by the department chairperson and submitted to the Honors Council by the Honors Program calendar deadlines posted online. Further information can be obtained from the student's academic adviser, the department chairperson and from the Honors Council.

The major in anthropology requires that students complete nine courses. Students may count a total of two sociology courses (one methods/theory course and one elective course) toward the anthropology major. Requirements are as follows:

ANTH 109	Introduction to Cultural Anthropology	1
ANTH 201	Field Research in Local Communities	1
ANTH 283	Theory in Anthropology	1
ANTH 330	Advanced Seminar in Anthropology [1]	1
ANTH Electives (one must be at the 300 level)		4
In addition, students must take ONE of the following courses:		1
SOCI 208	Methods of Social Research	
SOCI 209	Analyzing the Social World	
SOCI 211	Classical Sociological Theory	
SOCI 212	Sociological Theory	

[1] This course serves as the Culminating Experience.

The major in anthropology provides students with an overview of the discipline, broad exposure to cultural issues and anthropological concerns, and a variety of specialty areas in the field, reading and writing skills, and information literacy. Courses emphasize careful reading and analysis of ethnographic and theoretical texts, writing as part of both research process and presentation of results, presentation to multiple audiences, and how to find and use information from multiple sources. Students will graduate prepared for the workforce or graduate/professional study.

The department strongly recommends that core courses be taken as early as possible in a student's career (preferably during the sophomore or junior year). Students should take at least one anthropology course at the 100 or 200 level before taking the methods courses (ANTH 201, SOCI 208 or SOCI 209). Methods courses are not intended for first-year students.

Courses that are cross-listed as anthropology and sociology courses count as anthropology courses and still allow anthropology majors to take one elective designated solely as a sociology course.

Up to two off-campus courses may be counted toward 200-level electives in the major. The department chair may allow off-campus courses to count toward other major requirements if these courses adequately substitute for material that is taught in our department.

Minor in Anthropology

The minor in anthropology requires a minimum of five courses in anthropology, with no more than one course at the 100 level. No more than one off-campus course ordinarily counts toward the minor.

Anthropology Learning Goals

Demonstrate a basic understanding of the field of cultural anthropology.

Demonstrate awareness of the sub-fields within anthropology (biological anthropology, archeology, linguistic anthropology, cultural anthropology) and of applied anthropology.

Demonstrate a basic understanding of ethnography and how it differs from other types of qualitative and quantitative research methods in the social sciences.

Demonstrate an awareness of the variety, variability and relativity of social categories and systems of meaning around the world.

Demonstrate a familiarity with different cultures in a least one ethnographic region of the world.

Demonstrate knowledge of the history of anthropology and the development of the major theoretical perspectives of the discipline.

Courses

ANTH 109. Introduction to Cultural Anthropology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Nature and scope of the field: method and theory, institutions of human beings in cross-cultural perspective, case studies. Preference to first and second year students. Juniors and seniors only with permission.

ANTH 201. Field Research in Local Communities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Participant-observation, interviewing, and other field research methods. Students will devise and conduct their own ethnographic research projects in a local community. Not open to first-year students. Crosslisted as SOCI 201.

ANTH 202. Rainforests and Eco-Politics in Latin America. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
We study how business interests, scientists, and indigenous peoples think and engage with rainforests in radically different ways. Attentive to these differences, the course explores how rainforests are being destroyed by some groups and protected by others. Crosslisted as ENST 209 and LAMS 202.

ANTH 205. Violence, Conflict and Peace in Latin America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the historical and contemporary causes of political, structural and systematic forms of violence in Latin America. Crosslisted as IREL 205 and LAMS 205.

ANTH 206. Special Topics in Anthropology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics related to current events/issues in anthropology.

ANTH 208. Global Indigenous Politics and Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores Indigenous people's historical and contemporary struggles for recognition and respect with an emphasis on Indigenous groups in Latin America and global governance. Crosslisted as IREL 208 and LAMS 208.

ANTH 210. Environmental Ethnography. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores environmental issues from around the world through scholarly readings in environmental anthropology. Students will also examine and practice the ethnographic methods that qualitative social scientists use to understand environmental phenomena. Not open to first-year students. Crosslisted as ENST 210.

ANTH 232. Gender and Sexuality in South Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores issues of gender and sexuality in South Asia, primarily India and Sri Lanka. Topics include marriage, family, life cycle, religion and nationalism. Crosslisted as WMST 232.

ANTH 243. Violence and Politics in Southeast Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to diversity of contemporary Southeast Asia. Interdisciplinary perspectives on topics including politics, gender, religion, violence, and globalization.

ANTH 251. Gender, Power and Global Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the relationship between women and development, and an ideological, economic, political, and social enterprise. Crosslisted as WMST 251.

ANTH 256. Anthropology of Native North America. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
This course introduces students to the anthropology of contemporary Native North America. The goal is to teach students the theories, concepts, and methods used by anthropologists to investigate and explain the practices, beliefs, attitudes, and organization of Native peoples.

ANTH 260. Environmental Anthropology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Using anthropological methods and theories as a guide, this course considers the form and content of human interactions with the environment in various regions of the world.

ANTH 265. Food, Eating, and Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Social significance of food and eating. Taboos and ritual, food and identities, eating and political hierarchy, food and gender, global culture. Materialist and symbolic interpretations.

ANTH 266. Money, Markets and Magic. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will provide an introduction to the study of economic systems within specific cultural contexts. We will consider how economic systems interact with other aspects of daily life on the level of the individual, the family, and society.

ANTH 267. Anthropology of Tourism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Tourism is one of the largest industries in the world. The contemporary tourism industry is an outgrowth of global capitalism. We will consider the specific relationships between tourists, toured, service providers, the state, and money.

ANTH 283. Theory in Anthropology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the historical and contemporary theories in cultural anthropology; conceptualizations of culture, society, humankind; history and critical assessment of the concept of culture in anthropology. Crosslisted as ANTH 683.

ANTH 290. Medical Anthropology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Health and illness are not solely determined by an individual's biology. Their social determinants are the focus of this course. An understanding of health requires an investigation into the cultural meanings of the body, social relations, and the systems of power in which they are embedded.

ANTH 291. Culture and Mind. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the relationship between cultural and mental phenomena through a historical and cross-cultural perspective. What does the study of the mind as a cultural phenomena reveal about social life, conflicts and movements?.

ANTH 292. The Anthropology of Wellbeing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course will examine wellbeing from an anthropological prospective. We will examine how wellbeing is defined, learned and practiced in different cultural settings across the world. We will also examine how wellbeing is experienced and expressed in rural Pennsylvania. Students will also learn theories and methods in anthropology.

ANTH 306. Culture and Madness. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar examines the mental health and illness in cross-cultural perspective. Questioning commonly held notions about the nature of madness, the course focuses on how categories of deviance and abnormality are assigned to people.

ANTH 307. Language & Environmental Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Communication is central to how people perceive the environment, understand their relationship to it, and organize actions to change it. This course draws on concepts from linguistic anthropology, including discourse analysis, to examine debates about wildlife conservation, clean energy, eco-friendly products, environmental rights, and climate change. Crosslisted as ENST 320 and LING 320.

ANTH 308. Special Topics in Anthropology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics related to current events/issues in Anthropology.

ANTH 310. Culture, Nature and Place. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
We examine the intersection of place, nature and culture throughout the world, including our own backyard. Prerequisites: permission of the instructor and ANTH 109 or GEOG 101.

ANTH 311. Mind, Madness and Medicine. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
The cross-cultural study of mental health and illness, gender and health, pharmaceuticals, and ritual healing, etc. This is a student led seminar.

ANTH 312. Global Health. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar examines the global impact of social, political, and economic processes on health and illness, emphasizing anthropological methods and theories. Topics include infectious diseases, mental health, disasters, ageing, reproductive health, and development aid.

ANTH 319. Honors Course in Anthropology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies
Each student selects a project to be developed individually. Prerequisite: permission of the instructor.

ANTH 320. Honors Course in Anthropology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies
Each student selects a project to be developed individually. Prerequisite: permission of the instructor.

ANTH 325. Advanced Reading in Anthropology. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:12; Repeatable
Readings developed around the interest of individual students. Prerequisite: permission of the instructor.

ANTH 326. Advanced Reading in Anthropology. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:12; Repeatable
Readings developed around the interest of individual students. Prerequisite: permission of the instructor.

ANTH 329. Religions in Africa: Spirits, Saints, and Sufis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the diversity of religious beliefs and practices in Africa. Religious change, syncretism, and ritual debates. Prerequisite: any anthropology course or permission of the instructor.

ANTH 330. Advanced Seminar in Anthropology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Focuses on selected topics of ethnographic and theoretical interest, varying from year to year according to the professor. This Culminating Experience course is open only to senior anthropology majors, and junior anthropology majors by permission. Prerequisite: ANTH 283 (may be taken concurrently) and permission of the instructor.

ANTH 332. Women & the Penal System. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course explores the interface between inequality, crime, punishment and justice, with an emphasis on women in the United States; the course is populated by both Bucknell students and incarcerated students at a nearby women's prison. Prerequisite: permission of the instructor. Crosslisted as WMST 332.

ANTH 351. Field Research. .5-2 Credits.
Offered Alternating Spring Semester; Lecture hours:3; Repeatable
Independent investigation in the field; formulation of hypotheses, construction of measuring instruments, data collection, data analysis, and test of hypotheses.

ANTH 371. Dance, Culture and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of dance as cultural and political practice. Topics include: colonialism; the politics of tradition; gender, ethnicity, and nationalism; dance and violence. Prerequisites: not open to first-year students or students who have taken ANTH 271 or WMST 271 Dance and Culture. Crosslisted as UNIV 371 and WMST 371.

Art & Art History

Faculty

Professors: Tulu Bayar, Roger I. Rothman (Chair)

Associate Professors: Jonathan C. Frey, Anna Kell, Eddy A. López, Joseph Meiser

Assistant Professors: Carly Boxer, Carolyn Wargula

Visiting Assistant Professor: Paolo Morales

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The Department of Art & Art History provides students with the opportunity to develop their creative and critical skills through the creation and analysis of art. Through its two majors—art & design and art history—students connect the visual arts to broader ideas and global culture.

Majors

The department offers majors in art & design, and art history. Students contemplating either of these majors are encouraged to discuss their interests with the department chair or an appropriate department faculty member prior to declaring a major in the spring of the sophomore year. The skills of writing, speaking, researching and learning to analyze various sources (i.e., information literacy), and cultural fluency are integral to the disciplines of studio art and art history and play an important role in the department's curriculum.

Resources

We have well-equipped studios in areas of painting, photography, printmaking and sculpture, as well as drawing and graphic design. In addition, we have a computer lab for digital media. The Samek Art Museum, located in the Elaine Langone Center, organizes exhibitions and installation projects that put contemporary art and historical art in dialogue with other disciplines. Its permanent collection – which includes especially strong holdings in the graphic arts and photography, as well as the Samuel H. Kress Collection of European paintings and sculpture – is used for study and research by classes in art & design and art history. Together, the Department of Art & Art History and the Samek Art Museum sponsor workshops, lectures and on-site installations by visiting artists, critics and historians. Faculty and students take advantage of Bucknell's proximity to major museums and galleries through organized trips and individual travel to sites including New York City, Philadelphia, Baltimore and Washington, D.C.

Honors

A program leading to a major with honors in art & design or art history may be proposed by the student in consultation with the department chair and appropriate department faculty. The student generally undertakes a specifically designed sequence of courses and independent research culminating in a significant studio project or written thesis.

Graduate Study and Careers

Students considering graduate studies in art & design, art history, art administration, art conservation, museum studies or related fields should consult College Art Association (CAA) guides and other materials available online and in the art department office. Department faculty members will be glad to provide information on careers in art and art history and on M.A., M.F.A. and Ph.D. programs and fellowships.

Art & Design

Classes in art & design allow students to translate their creative vision into works of art. Small classes allow the faculty to offer one-on-one instruction that encourages a synergy between technical skills, imagination and conceptual depth. Art & design majors graduate with confidence in their ability to be innovative thinkers and imaginative creators in any endeavor.

Art & Design Major

The art & design major consists of a minimum of **nine** courses, eight of which must be in art & design, and one of which must be in art history. The chair of the Department of Art & Art History shall make the determination of whether a particular course outside the art & art history department may count as a course toward this major.

Distribution of required courses for the **Art & Design** major:

ARTD 131	Drawing I [1]	1
Two of the following 100-level elective courses in art & design should be completed within the first or second year.		2
ARTD 112	Photography I	
ARTD 120	Painting I	
ARTD 128	Introduction to Web Design	

ARTD 130	Printmaking I	
ARTD 143	Graphic Design I	
ARTD 150	Sculpture I	
One 200-level or higher art & design course in each of the four following areas: (1) Painting/Drawing, (2) Photography, (3) Printmaking/Design, and (4) Sculpture/Digital Sculpture		4
ARTD 230	Printmaking II	
ARTD 231	Drawing II	
ARTD 234	Photographic Storytelling	
ARTD 238	Painting II	
ARTD 239	Digital Sculpture 1: Fabrication	
ARTD 243	Graphic Design II	
ARTD 247	Photography II	
ARTD 250	Sculpture II	
ARTD 252	Digital Sculpture 2: VR	
ARTD 340	Video Art and Installation	
ARTD 345	Painting III	
ARTD 346	Printmaking III	
ARTD 347	Photography III	
ARTD 348	Sculpture III	
One Culminating Experience: 300-level art & design elective		1
In their junior or senior year, each art & design major will enroll in a 300-level course in the area of their choosing (printmaking/design, painting, photography or sculpture), and create an independent visual art project exploring concepts in one or more media.		
ARTD 300	Culminating Experience-Photography	
ARTD 301	Culminating Experience-Sculpture	
ARTD 302	Culminating Experience-Painting	
ARTD 303	Culminating Experience-Printmaking/Design	
ARTD 340	Video Art and Installation	
ARTD 345	Painting III	
ARTD 346	Printmaking III	
ARTD 347	Photography III	
ARTD 348	Sculpture III	
Art history course		1

[1] ARTD 131 Drawing I should be completed within the first or second year.

Satisfying the College of Arts & Sciences Core Curriculum (CASCC) Disciplinary Depth Goals

Courses in the art & design major provide disciplinary depth through:

1. Skills in visual language: Students majoring in art & design perform significant technical and conceptual skills by creating works of art and design through hands-on assignments.
2. Critical and creative thinking: All art & design courses facilitate student learning toward how to think critically, analytically and conceptually about works of art and design.
3. Skills in formal presentation: Several courses require dynamic and persuasive oral presentations. These courses cultivate presentation skills through practicing presentational strategies and integrating multimedia content to support student ideas and arguments.

Two minors are offered in Art & Design.

Visual Art Minor

The minimum requirement for a minor in visual art is **five** courses, at least two of which should be above the 100 level. The chair of the Department of Art & Art History shall make the determination of whether or not a particular course outside the art & art history department may count as a course toward this minor.

Distribution of required courses for the **Visual Art Minor**:

ARTD 131	Drawing I	1
A selection of courses in at least two of the following Art & Design areas. At least two of the courses should be 200 level or above:		4
Painting/Drawing		
ARTD 120	Painting I	
or ARTD 231	Drawing II	
or ARTD 238	Painting II	
Photography		
ARTD 112	Photography I	
or ARTD 234	Photographic Storytelling	
or ARTD 247	Photography II	
Printmaking		
ARTD 130	Printmaking I	
or ARTD 230	Printmaking II	
Sculpture		
ARTD 150	Sculpture I	
or ARTD 250	Sculpture II	
or ARTD 239	Digital Sculpture 1: Fabrication	
or ARTD 252	Digital Sculpture 2: VR	

Visual Design Minor

The minimum requirement for a minor in visual design is **five** courses, at least two of which should be above the 100 level. The chair of the Department of Art & Art History shall make the determination of whether or not a particular course outside the art & art history department may count as a course toward the minor.

Distribution of required courses for the **Visual Design Minor**:

ARTD 131	Drawing I	1
A selection of courses in all of the three following Art & Design areas. At least two of the courses should be 200 level or above:		4
Design		
ARTD 143	Graphic Design I	
or ARTD 243	Graphic Design II	
or ARTD 245	Interactive and Web Design	
Digital Sculpture		
ARTD 239	Digital Sculpture 1: Fabrication	
or ARTD 252	Digital Sculpture 2: VR	
Photography		
ARTD 112	Photography I	
or ARTD 234	Photographic Storytelling	
or ARTD 247	Photography II	

Art & Design majors will be able to:

1. Think critically, analytically and conceptually about works of art and communicate their thoughts effectively in speech and in writing. More advanced students would begin to develop a greater understanding of theoretical frameworks for understanding art. (1, 2, 4, 5, 6, 8)
2. Produce creative works that demonstrate imagination and inventive use of processes, materials and concepts. (1, 2, 4, 5, 6, 8)
3. Exhibit visual literacy by communicating ideas through visual means and effectively interpreting visual culture in their portfolios. (4, 5, 6, 7, 8)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

ARTD 112. Photography I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:4
An introduction to the theory, practice and criticism of fine art photography. Not open to juniors or seniors.

ARTD 120. Painting I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:4
Studio course to introduce basic techniques and materials of painting, color theory and its application, image and composition. Not open to seniors.

ARTD 128. Introduction to Web Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:4
Introduction to designing and developing web content. Not open to seniors.

ARTD 130. Printmaking I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
An introduction to visual concepts and processes in intaglio, relief and screen printing. Not open to seniors.

ARTD 131. Drawing I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:4
The tradition of drawing, its practice and theory in various media. Not open to seniors.

ARTD 143. Graphic Design I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
An introductory studio course, Graphic Design I focuses on the fundamental elements, principles, and processes of design and their applications towards effective visual solutions. Not open to seniors.

ARTD 150. Sculpture I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Students will be introduced to a variety of sculptural materials and methods of fabrication, become familiar with the work of contemporary sculptures, and learn to interpret visual works. Seniors by permission of the instructor.

ARTD 230. Printmaking II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Individual projects in intaglio and woodblock printing with an emphasis on concept and refinement of image. Prerequisite: permission of the instructor.

ARTD 231. Drawing II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
A continuation of ARTD 131 (ARST 131) with emphasis on concept and refinement of image. Prerequisite: permission of the instructor.

ARTD 234. Photographic Storytelling. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
This course considers photography as a vehicle for storytelling. Topics including the history, ethics, and contemporary practice of photographic essay will be explored. Students will create short-term narrative projects and hone their visual storytelling skills through critique and feedback from their instructor and classmates. Prerequisite: ARTD 112 or ARTD 131 or ARTD 143.

ARTD 238. Painting II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
An expanded introduction to painting practices. Emphasis on process, materials, content and individual creativity within the context of structured assignments. Prerequisites: ARST 120 or ARTD 120 and permission of the instructor.

ARTD 239. Digital Sculpture 1: Fabrication. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Students will learn to use computer-aided design software in conjunction with 3D printers, 3D scanners, laser cutters and CNC routers to create sculptures with physical materials. Students will also learn to interpret works of art and research the work of relevant contemporary artists. Prerequisite: permission of the instructor.

ARTD 243. Graphic Design II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Studio course exploring proper practices in graphic design, engaging students in all aspects of the design process- from research and conceptualization, to design and implementation. A core principle will be the application of design and design thinking for positive social impact. Prerequisites: 100-level ARTD course and instructor permission.

ARTD 245. Interactive and Web Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Interactive and Web Design is an introductory course to interactive and web design fundamentals. The course will explore proper practices in the design and development of screen interfaces, from wireframing and prototyping, to semantic HTML and CSS, to hosting and publishing. Prerequisites: 100-level ARTD course and instructor permission.

ARTD 247. Photography II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
This course builds upon skills and knowledge gained in ARST 112 or ARTD 112, including more complex technical and critical methods and development of personal direction. Prerequisites: ARST 112 or ARTD 112 and permission of the instructor.

ARTD 248. Photographic Self-Portraiture. 1 Credit.
Offered Occasionally; Lecture hours:Varies,Other:4
How do we learn about ourselves through the act of being both a maker and subject of photographs? Regular discussion of on-going student work and analysis of artists who produce self-portraits is the core of this course. Students will produce prints digitally and in the darkroom.

ARTD 250. Sculpture II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Building on the fundamental skills acquired in Sculpture I, students will utilize more technically demanding processes, including: steel fabrication, woodworking and mold making. Prerequisite: permission of the instructor.

ARTD 252. Digital Sculpture 2: VR. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Students will develop virtual reality experiences as works of visual art. Students will also become familiar with the work of contemporary digital artists and learn to interpret art. Previous experience with computer-aided design is helpful but not required. Prerequisite: permission of the instructor.

ARTD 300. Culminating Experience-Photography. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
In junior or senior year, each Art and Design major will enroll in one 300-level course in the area of their choosing: printmaking/design, painting, photography or sculpture. Students will create an independent visual art project exploring concepts in one or more media. Prerequisite: permission of the instructor.

ARTD 301. Culminating Experience-Sculpture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
In junior or senior year, each Art and Design major will enroll in one 300-level course in the area of their choosing: printmaking/design, painting, photography or sculpture. Students will create an independent visual art project exploring concepts in one or more media. Prerequisite: permission of the instructor.

ARTD 302. Culminating Experience-Painting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
In junior or senior year, each Art and Design major will enroll in one 300-level course in the area of their choosing: printmaking/design, painting, photography or sculpture. Students will create an independent visual art project exploring concepts in one or more media. Prerequisite: permission of the instructor.

ARTD 303. Culminating Experience-Printmaking/Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
In junior or senior year, each Art and Design major will enroll in one 300-level course in the area of their choosing: printmaking/design, painting, photography or sculpture. Students will create an independent visual art project exploring concepts in one or more media. Prerequisite: permission of the instructor.

ARTD 340. Video Art and Installation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
This course provides a forum for students for self-expression through structured and independent assignments. The course introduces how to employ digital video technologies in contemporary art making and presents practical and theoretical aspects of avant-garde art creation in historical and critical context. Prerequisite: permission of the instructor.

ARTD 345. Painting III. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
A combination of painting projects with an emphasis on individual development of ideas and technique with the vast possibilities of contemporary painting practices. Prerequisites: ARST 238 or ARTD 238 and permission of the instructor.

ARTD 346. Printmaking III. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Advanced projects in printmaking to develop individual themes and concepts. Prerequisites: ARST 230 or ARTD 230 and permission of the instructor.

ARTD 347. Photography III. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Advanced projects in photography to develop individual themes and concepts. Prerequisites: permission of the instructor and technical photography knowledge.

ARTD 348. Sculpture III. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4
Advanced projects in sculpture to develop individual themes and concepts. Prerequisites: ARST 250 or ARTD 250 and permission of the instructor.

Art History

Mission

Art history courses offer students a critical lens into human-made objects, images and sites from across the world: from the traditional media of painting, sculpture and architecture to the wider array of material culture that includes photography, jewelry, porcelain, amulets, bronze vessels, earthworks, happenings, polychrome prints, video art, textiles and illuminated manuscripts. Through direct engagement with these objects, students come to understand the past and the ways art's history shapes our views of the present.

The art history faculty is dedicated to exploring art with sensitivity to diverse cultural and historical contexts. We strive to increase critical consciousness about art history's role as a force of both domination and liberation. We support and encourage building a more diverse and inclusive

approach to the art of the past and present by centering the human experience and emphasizing collaboration and community. We aim to foster an environment in which students develop their intellectual curiosity and critical thinking skills as tools for both individual and collective enrichment.

Sequencing of Courses

Students are invited to enter the study of art history at any level. Regarding courses at the three hundred level, we welcome the ambitious student to enroll in the course with no prior knowledge of the material, but they must be prepared to participate in small group discussions and willing to engage with texts that are longer and more challenging than those assigned at the 100 and 200 levels.

- ARTH 100 provides a geographically and chronologically diverse introduction to a wide range of artistic practices. Students will be introduced to the fundamental skills of visual and historical analysis. Courses will take different thematic approaches based on the instructor's expertise.
- Two-hundred level courses develop more specialized knowledge in particular geographic, chronological, religious and political traditions of art-making. Students will improve their written and analytical skills by working with art made in specific historical contexts.
- Three-hundred level courses are small, discussion-based seminars that delve deeply into a single period, technique or theme. Students will hone their skills at close reading and collaborative learning.
- The Culminating Experience Seminar is an opportunity for seniors to develop an understanding of the methods and theories of art history and devise and present original research.

Double Majors

Students will find that the skills they develop through the study of art history will complement wide ranging interests and career trajectories. Past art history majors have also majored in such disciplines as economics, political science, psychology, management, as well as a host of other social sciences and humanities.

Careers

Art history is a versatile major enabling graduates to pursue exciting careers at major museums, auction houses and galleries and to apply their art historical skills to the study of medicine, law, business and education.

Art History Major

The art history major consists of a minimum of 8 courses, 7 of which must be in art history and 1 of which must be in art & design. No more than 2 of the 8 required courses may be taken for credit at other institutions. We encourage majors to work with their advisers to develop a course of study that reflects the diversity of historical periods and geographical areas that make up the discipline of art history.

Courses for the major and minor are structured to be non-hierarchical. Though we encourage students to take ARTH 100 early on in their study, it is not necessary that it be the first course taken.

Distribution of required courses for the **Art History Major**:

ARTH 100	Introduction to Art History [1]	1
4 courses taught at the 200 level [2]		4
1 course taught at the 300 level [3]		1
ARTH 402	Culminating Experience [4]	1
1 Art & Design course		1

1. ARTH 100 provides a geographically and chronologically diverse introduction to a wide range of artistic practices. Students will be introduced to the fundamental skills of visual and historical analysis. Courses will take different thematic approaches based on the instructor's expertise.
2. 200-level courses develop more specialized knowledge in particular geographic, chronological, religious, and political traditions of art-making. Students will improve their written and analytical skills by working with art made in specific historical contexts.
   NOTE: At least one course at the 200 level or above must focus on art before 1800 and at least one course at the 200 level or above must focus on art after 1800.
3. 300-level courses are small, discussion based seminars that delve deeply into a single period, technique, or theme. Students will hone their skills at close reading and collaborative learning.
4. Culminating Experience (ARTH 402) is an opportunity for majors to develop an understanding of the methods and theories of art history and devise and present original research.

Study Abroad

Art history majors benefit immensely through study abroad. Students planning to undertake off-campus study should consult their adviser about the myriad programs available around the globe. With departmental approval, up to two art history courses taken abroad can be counted toward the major.

Honors

Students interested in pursuing Honors in art history should, in their junior year, contact a faculty member to discuss the process. Should the faculty member agree to mentor the student, they will take two courses ARTH 410 and ARTH 411 in their senior year. These are in addition to the eight courses required for the major. With the guidance of a faculty member in the department the student researches, writes and defends an original scholarly work. For more information, please review the Honors Program website.

Art History Minor

A minor in art history provides the opportunity to explore some of the exciting aspects of the discipline without committing to the full requirements of the art history major. Minors will find that the skills they develop through the five-course program will complement their primary areas of study and provide a rewarding emphasis on critical and visual thinking.

Courses for the major and minor are structured to be non-hierarchical. Though we encourage students to take ARTH 100 early in their study, it is not necessary that it be the first course taken.

The **Art History minor** consists of 5 courses:

ARTH 100	Introduction to Art History	1
Three courses at the 200 level or above		3
One course at the 300 level or above		1

Study Abroad

Art history minors benefit immensely through study abroad. Students planning to undertake off-campus study should consult their adviser about the myriad programs available around the globe. With departmental approval, up to two art history courses taken abroad may be counted toward the minor.

Art History Majors will be able to:

1. Understand the complex relationships between works of art and their historical and cultural contexts (1, 3)
2. Apply interpretive frameworks to analyze works of art as primary sources. (6, 8)
3. Interrogate the established conventions within the field of art history. (1, 5)
4. Demonstrate effective communication to specialist and non-specialist audiences. (7)
5. Understand how art can be a source of personal and collective enrichment. (5, 9)

Numbers in parentheses reflect related Educational Goals (http://www.bucknell.edu/x50032.xml) of Bucknell University.

Courses

ARTH 100. Introduction to Art History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Why does art matter? This course will examine artworks from diverse cultures and consider just how interconnected the world has been, how definitions of art have changed through space and time, and how the past continues to inform (and impact) our present.

ARTH 202. Arts Leadership: Museums. 1 Credit.
Offered Spring Semester Only; Lecture hours:1,Other:2
Providing an introduction to Museum Studies and Curatorial Studies, this course covers the history and practices of museums. It reveals how museums perform social memory functions like collection and preservation in the broader field of cultural heritage institutions. It explores museum curating and cultural programming in comparative arts presenting organizations. Crosslisted as UNIV 201.

ARTH 207. Birth of Modern Art: 1850-1915. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Examination of artists and movements from 1850-1915, including Realism, Impressionism, Post-impressionism, Symbolism, Expressionism, Fauvism, Cubism and Abstraction. Focus on innovations in French painting and urban experience.

ARTH 208. Surrealism to the Present. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Significant artists from twentieth century from WWI to the present. Movements: Futurism, Dadaism, Constructivism, Surrealism, Abstract Expressionism, Minimalism, Fluxus, Earth Art, Conceptual Art, Performance Art, Feminist Art, Pop Art, Institutional Critique, Social Practice Art. Readings from textbook, documents, art historians. Grades by weekly writing assignments; one exam and research paper.

ARTH 209. Art, Science, and Magic in the Medieval World. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
What did "science" and "magic" look like in the medieval world? How did concepts of art, science, magic, and religion overlap, and how do modern definitions obscure premodern ideas about the natural world? Students will develop the conceptual tools necessary to confront these questions using visual evidence.

ARTH 212. Global Decorative Arts. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines artworks often undermined as "craft" or "decorative art." Chinese ceramics, Japanese glittering lacquered screen, and South Asian calico textiles were important financial generators and coveted luxury items. These global artworks sparked artistic innovations but also came at a terrible cost of colonial violence.

ARTH 217. Performance Art, Then and Now. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Hugo Ball reads nonsense poetry in a Zurich cafe; Marina Abramović breathes in air from a high-powered fan until she falls unconscious; William Pope L. crawls down Broadway dressed in a Superman costume. This course explores the provocative history of performance art from Europe, Asia, and the Americas.

ARTH 222. Philosophy of Art. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of the creative process, the work of art, natural beauty, aesthetic experience, and principles of criticism. Crosslisted as PHIL 212.

ARTH 230. Awakening: Arts of Buddhism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines the centuries-long history of Buddhist image-making that took on many forms across a wide geographic reach: from the sublime imagery on monumental stupas of ancient India, polychrome cave paintings of western China, mesmerizing mandalas of the cosmos in Tibet, and the spontaneous Zen ink painting of Japan.

ARTH 231. Arts of East Asia. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This course introduces you to the art of China, Korea and Japan from prehistory to the present. We examine a broad range of objects—ritual bronze vessels, Buddhist temple architecture, Neo-Confucian landscape painting and ukiyo-e woodblock prints—to emphasize how cross-cultural exchanges stimulated new interpretations across time and space. Crosslisted as EAST 231.

ARTH 241. Archaeology of Egypt. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Survey of the material culture, with emphasis on major architectural and artistic developments and their legacy to modern Western civilization. Crosslisted as CLAS 241.

ARTH 242. Archaeology of Greece. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of the material culture of the Greek world from the Bronze Age through the Hellenistic period. Crosslisted as CLAS 242.

ARTH 243. Archaeology of Rome. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Survey of the material culture of the Roman world from the Etruscans through the late Empire. Crosslisted as CLAS 243.

ARTH 262. Life in Ancient Pompeii. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the history, literature and material culture of Pompeii with the goal of better understanding daily life for all levels of society in the early Roman Empire. Crosslisted as CLAS 262.

ARTH 265. Contemporary Philosophy of Art. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An investigation of and focused study of contemporary philosophical issues in the arts and aesthetics more generally. Crosslisted as PHIL 265.

ARTH 310. The Body in Premodern Art. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will investigate the representation and perception of the human body in ancient and medieval visual culture. Looking at objects, images and sites from across the premodern world, we will examine premodern art through lenses of gender and sexuality, race, health and illness, disability, pain, aging and death.

ARTH 319. Independent Study in Art History. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Advanced problems in art history. Prerequisite: permission of the instructor.

ARTH 320. Independent Study in Art History. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Advanced problems in art history. Prerequisite: permission of the instructor.

ARTH 322. Decolonizing Museums: The History & Ethics of Collecting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the formation of art collections and the ethical challenges that museums face. Using wide ranging examples from cultural and historical perspectives, we evaluate arguments for and against encyclopedic museums, examine laws aiming to prevent antiquity trafficking, and analyze case studies of repatriation.

ARTH 323. Contemporary Art. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of key artists and concepts of the past 30 years. Focus on the transformation from modernism to postmodernism in painting, sculpture, photography, and performance art.

ARTH 326. The Art of the Book and Books as Art. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on developments and changes in the making of books – both print and manuscript – and the images they contain. We will explore how books have been made, read and seen from antiquity to today. This seminar includes extensive, first-hand study of materials at Bucknell's Special Collections.

ARTH 330. Hokusai and the Global Art of Edo. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
From luminous golden folding screens to delicate lines in woodblock prints, the arts of Edo (1603-1868) Japan profoundly impacted artists worldwide. How is this art global when seclusion policies of the era forbade foreign travel? Such questions guide our discussion as we focus particularly on artworks in the Samek Museum. Crosslisted as EAST 330.

ARTH 402. Culminating Experience. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Required for all art history majors. Students will explore individual research projects independently and workshop them in class. The class will culminate in a departmental art history conference where students will present their work. Prerequisite: senior status. Juniors by permission only.

ARTH 410. Art History Honors Thesis Fall. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Substantial independent work on a topic approved by the Department of Art and Art History and the Honors Council as satisfying the requirements for a senior honors thesis. Focus on research and drafting. Prerequisite: permission of the instructor.

ARTH 411. Art History Honors Thesis Spring. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Substantial independent work on a topic approved by the Department of Art and Art History and the Honors Council as satisfying the requirements for a senior honors thesis. Focus on writing and revising. Prerequisite: permission of the instructor.

Arts Leadership Minor

Faculty

Director: Ghislaine G. McDayter

Coordinator: Rick Rinehart

Co-coordinators: Andrew Ciotola, Kathryn Maguet

The arts leadership minor is designed to impart a practical and theoretical foundation in arts organizations and related professions for students who wish (a) to broadly understand and engage the arts and cultural industry, and (b) to pursue professional careers in the arts. Arts leadership students learn how arts professionals and organizations plan, develop, execute and sustain nonprofit endeavors in the arts.

Drawing on Bucknell's rich arts resources and professional arts centers, the program offers an overview of the skills necessary for building careers in the visual, performing, and literary arts, and the challenges and rewards of working in the burgeoning arts and culture sector. The minor is intended broadly for students from any major whose career trajectories may intersect with the arts, and more particularly as a supplement to traditional arts majors. The program provides a pathway for students interested in arts management, theatre management, museum studies, curatorial studies or literary arts management. The minor illustrates a strong commitment to interdisciplinarity at Bucknell, incorporating historical, theoretical and applied objectives, and including coursework and experiential learning opportunities at the university and beyond.

The arts leadership minor is jointly administered by the Samek Art Museum, Stadler Center for Poetry & Literary Arts, and Weis Center for the Performing Arts. Inquiries can be directed to the minor coordinators at artsleadership@bucknell.edu ("artsleadership@bucknell.edu").

The minor consists of 5 courses (4.5 credits).

I. Core Courses

These courses are listed in the suggested (but not required) order in which students should take them.		2.5
UNIV 199	Arts Leadership: Survey (1 credit)	

UNIV 201	Arts Leadership: Museums (1 credit)
UNIV 211	Arts Leadership: Internship (.5 credit)

II. MORS 201

Students for whom MORS 201 satisfies a major requirement will instead take one additional arts course from section III in its place (for a total of two courses from section III). Those two arts courses must be from different departments.

MORS 201	Organizational Forms, Strategy and Structure	1

III. Arts Course(s)

Select one. Arts majors must take this course outside their major.		1
ARTD 112	Photography I	
ARTD 120	Painting I	
ARTD 130	Printmaking I	
ARTD 150	Sculpture I	
ARTD 234	Photographic Storytelling	
ARTH 322	Decolonizing Museums: The History & Ethics of Collecting	
DANC 250	History of Dance	
ENCW 101	Creative Writing	
ENCW 202	Fiction Workshop	
ENCW 203	Creative Nonfiction Workshop	
ENCW 204	Poetry Workshop	
ENCW 250	The Writing World	
ENFS 130	Introduction to Film/Media Studies	
MUSC 122	Introduction to Western Music	
MUSC 123	Introduction to Music	
MUSC 125	Introduction to Jazz	
MUSC 126	Introduction to Popular Music in the U.S.	
MUSC 127	Introduction to Rock Music	
THEA 256	Rituals, Festivals, Institutions	
THEA 260	Theatre and Revolution	
THEA 250	Colorful Fashion Histories	

Astronomy

Faculty

Professors: JiaJia Dong, Jack F. Gallimore, Sally Koutsoliotas, Edwin F. Ladd, Thomas H. Solomon, Katharina Vollmayr-Lee

Associate Professors: A. Matthew Amthor, Ibrahim A. Sulai, Michele D. Thornley, Benjamin P. Vollmayr-Lee (Chair)

Assistant Professors: Bekele Gurmessa, Deepak Iyer, Abigail Kopec, Jackie Villadsen

Visiting Assistant Professor: Ofelia Traistaru

Astronomy courses are taught by the faculty in Physics & Astronomy (p. 263). We offer courses both for non-science majors (ASTR 101 and ASTR 102) and students in natural science, mathematics and engineering degree programs (ASTR 201 and ASTR 301).

Biology

Faculty

Professors: Morgan Benowitz-Fredericks, Elizabeth A. Capaldi, Kenneth A. Field, Mark F. Haussmann (Chair), Stephen D. Jordan, Christopher Martine, Matthew E. McTammany, Leocadia V. Paliulis (Associate Dean of Natural Sciences and Mathematics), Marie C. Pizzorno, DeeAnn M. Reeder, C. Tristan Stayton (Associate Chair)

Associate Professors: Julie A. Gates, Matthew B. Heintzelman, Sarah E. Lower, Mark D. Spiro, Emily Stowe, Mizuki Takahashi

Assistant Professors: Moria Cairns Chambers, Matthew Q. Clark, Jayne A. Kubat (Teaching), James Pearson (non-tenure track)

Visiting Assistant Professors: Terry Campbell, Jordan Lingo, Nathan E. Smith

Laboratory Directors: Meredith Seiler, Rebekah Stevenson

Postdoctoral Fellow: Janani Hariharan (Richard and Yvonne Smith Postdoc to Tenure Track Fellow in Biology)

Biology is the natural science that concerns itself with study of the living world. The faculty of the biology department approaches the principles of the science from the unifying perspective of the theory of evolution. Emphases include the theory and practice of how scientific investigations are conducted as well as the more practical applications of biology.

A major in biology may serve as a sound preparation for those interested in careers in the life sciences, including those who go on to graduate or medical school. Majoring in biology also adds to students' understanding of the issues concerned with health, the environment and agriculture. In addition, Bucknell's biology majors are given the opportunity to become broadly educated "whole" scientists. They are encouraged to explore their interests within the humanities and social sciences.

Biology Majors

Two degree programs are offered through the biology program.

Bachelor of Arts

The **Bachelor of Arts major** requires eight courses in biology.

Core Sequence

BIOL 201	Biological Inquiries and Observations [1]	1
BIOL 202	Course-based Undergraduate Research Experience [1]	1
BIOL 203	Integrated Concepts in Biology Fall [1]	1
BIOL 204	Integrated Concepts in Biology Spring [1]	1
Four 300-level biology electives [2]		4
CHEM 205	Principles of Chemistry [3]	1
or CHEM 207	Explorations in Chemistry	
CHEM 211	Organic Chemistry I [3]	1
MATH 201	Calculus I	1
or MATH 202	Calculus II	
MATH 216	Statistics I	1

1 Must be completed by the end of the third year.

2 One elective may be BIOL 399 Mentored Undergraduate Research, but additional 399 credit may be applied as electives beyond the courses offered for the major.
At least one elective must be in each of the three areas listed below. Two of these courses from different areas must be a laboratory or field course.

3 Must be completed by the end of the sophomore year.

Area I - Cellular/Molecular

BIOL 302	Microbiology	1
BIOL 308	Microbial Genetics	1
BIOL 324	Neurophysiology	1
BIOL 327	Molecular Biology	1
BIOL 331	Genomics	1
BIOL 332	Developmental Neurobiology	1
BIOL 340	Biochemical Methods	1
BIOL 347	Virology	1
BIOL 348	Immunology	1
BIOL 352	Cell Biology	1
BIOL 364	Advanced Data Analysis in Biology	1

BIOL 365	Introduction to Microscopy	1
BIOL 375	Cellular and Molecular Neurobiology	1

Area II - Organismal

BIOL 306	Biology of Host-Microbe Interactions	1
BIOL 309	Wildlife and Emerging Diseases	1
BIOL 312	Comparative Vertebrate Anatomy	1
BIOL 313	Mammalogy	1
BIOL 314	Amphibian Biology and Conservation	1
BIOL 318	Principles of Physiology	1
BIOL 328	Endocrinology	1
BIOL 332	Developmental Neurobiology	1
BIOL 339	Developmental Biology	1
BIOL 342	Neuroethology	1
BIOL 357	Ornithology	1
BIOL 358	Invertebrate Zoology	1
BIOL 373	Mycology	1

Area III - Ecological/Evolutionary

BIOL 307	Conservation Genetics	1
BIOL 321	Behavioral Ecology	1
BIOL 325	Evolutionary Genomics	1
BIOL 334	Limnology	1
BIOL 341	Evolution	1
BIOL 351	Field Botany	1
BIOL 353	Ecosystem Ecology	1
BIOL 354	Tropical Ecology	1
BIOL 355	Social Insects	1
BIOL 370	Primatology	1
BIOL 371	Field Entomology	1
BIOL 378	Evolutionary Medicine	1
Seminars (topics and area designations vary)		
BIOL 319	Seminar	1
BIOL 320	Seminar	1

Bachelor of Science

The Bachelor of Science major requires nine courses in biology. The major provisions in biology are the same as those noted under the Bachelor of Arts major, but five rather than four 300-level electives are required, only one of which may be BIOL 399 Mentored Undergraduate Research.

The Bachelor of Science major also requires:

CHEM 205	Principles of Chemistry [4]	1
or CHEM 207	Explorations in Chemistry	
CHEM 211	Organic Chemistry I [4]	1
MATH 201	Calculus I	1
or MATH 202	Calculus II	
MATH 216	Statistics I	1
PHYS 211 & PHYS 212	Classical and Modern Physics I and Classical and Modern Physics II	2
Select two of the following: [5]		
BMEG 431	Biomimetic Materials	
CHEM 212	Organic Chemistry II (highly recommended)	
CHEM 230	Principles of Chemistry 2	
CHEM 231	Quantitative Analysis	

CHEM 313	Synthetic Organic Chemistry
CHEM 314	Mechanistic Organic Chemistry
CHEM 317	Special Topics in Organic Chemistry
CHEM 321	Inorganic Chemistry I
CHEM 351	Biochemistry I
CHEM 352	Biochemistry II
CSCI 203	Introduction to Computer Science
CSCI 204	Data Structures & Algorithms
ENST 215	Environmental Planning
ENST 240	Sustaining Nature
GEOG 204	Applied G.I.S.
GEOG 345	Food and the Environment
GEOL 203	Physical/Environmental Geology
GEOL 204	Evolution of the Earth
GEOL 230	Environmental GIS
GEOL 305	Introduction to Geochemistry
GEOL 316	Geomorphology
GEOL 317	Paleontology
LING 230	Psycholinguistics
LING 325	Language and the Brain
MATH 202	Calculus II
MATH 211	Calculus III
MATH 217	Statistics II
PHIL 103	Logic
PHIL 201	Symbolic Logic
PHIL 220	Philosophy of Science
PHIL 272	Philosophy of Biology
PSYC 203	Learning
PSYC 204	Human Cognition
PSYC 250	Biopsychology
PSYC 252	Sensation and Perception
PSYC 324	Advanced Psychological Statistics

[4] Typically completed during the first year.

[5] Other courses may be substituted with department approval.

Students interested in behavioral aspects of biology may wish to consider the animal behavior major; those interested in biochemistry, the cell biology/biochemistry major; those interested in environmental issues, the environmental science bachelor of arts within the environmental studies program; and those interested in neurobiology, the neuroscience program. Students planning to continue with graduate training in biology are encouraged to elect MATH 217 Statistics II and/or MATH 202 Calculus II, and to consult their academic adviser or pre-health professions adviser.

One possible sequence for the bachelor of science major is as follows, but the biology department typically advises incoming first-year students to consider choosing between CHEM 205/CHEM 207 and MATH 201 during the first semester rather than taking them both in combination with BIOL 201 or BIOL 202.

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
BIOL 201 or 202	1	BIOL 201 or 202	1
CHEM 205 or 207	1	CHEM 211	1
MATH 201[6]	1	MATH 216	1
Foundation Seminar	1	Elective	1
	4		**4**

Sophomore

First Semester	Credits	Second Semester	Credits
BIOL 203	1	BIOL 204	1
Related area course[7]	1	Related area course	1
Elective	1	Elective	1
Elective	1	Elective	1
	4		**4**

Junior

First Semester	Credits	Second Semester	Credits
Elective in biology	1	Elective in biology	1
PHYS 211	1	PHYS 212	1
Elective	1	Elective	1
Elective	1	Elective	1
	4		**4**

Senior

First Semester	Credits	Second Semester	Credits
Two electives in biology	2	Elective in biology	1
Elective	1	Elective	1
Elective	1	Elective	1
		Elective	1
	4		**4**

Total Credits: 32

6 If a student has placed out of MATH 201 but not received credit, MATH 202 should be taken.
7 CHEM 212 is highly recommended.

Biology Minor

A minor in Biology consists of five courses.

BIOL 203	Integrated Concepts in Biology Fall	1
BIOL 204	Integrated Concepts in Biology Spring	1
At least two 300-level courses [1]		2
One additional biology course (100-, 200- or 300-level)		1
Total Credits		**5**

1 Cannot be BIOL 399 Mentored Undergraduate Research.

College of Arts & Sciences Core Curriculum – Disciplinary Exploration Requirements

Students in the biology major will satisfy the writing requirement by taking BIOL 201 Biological Inquiries and Observations, BIOL 203 Integrated Concepts in Biology Fall, and BIOL 204 Integrated Concepts in Biology Spring. Students in the biology major will satisfy the information literacy requirement by completing BIOL 201 Biological Inquiries and Observations and BIOL 202 Course-based Undergraduate Research Experience and at least two 300-level biology laboratory/field courses. They will satisfy the formal presentation requirement by completing BIOL 201 Biological Inquiries and Observations and BIOL 202 Course-based Undergraduate Research Experience as well as at least two 300-level courses in biology, which will include a required oral presentation. The Culminating Experience in Biology requirement will be fulfilled by taking one 300-level laboratory or field course from a list provided by the department in one of a student's last three semesters.

Transfer students must complete at least four courses in biology in residence at Bucknell, only one of which may be BIOL 399 Mentored Undergraduate Research.

For Bucknell students who elect to study abroad, at least three upper division courses toward the major and at least one toward the minor must be taught by Bucknell faculty.

Students who pass the BIOL 121 Biology for Non-majors, BIOL 122 Biology for Non-majors sequence with a grade of B or better in both courses may receive one core credit toward the biology major pending consultation with the department chair.

Biology Department Learning Goals

I. Knowledge

Students completing the BA or BS major in Biology will:

1. Demonstrate a proficiency with the concepts and methodologies of the traditional core of biology. (1, 4, 6, 8, 9)
2. Demonstrate the ability to use the scientific method. (1, 8)
3. Demonstrate the ability to apply concepts from diverse sub-disciplines of biology. (1, 6, 8)
4. Develop critical thinking skills to formulate and test biological questions. (1, 4, 6)

In addition students completing a BS in biology will:

1. Apply and integrate other related disciplines with their knowledge of Biology. (1, 2, 6)

II. Communication

Students completing the BA or BS major in Biology will:

1. Be able to write a well organized, logical and scientifically sound research paper or report. (1, 7, 8)
2. Be able to present a well organized, logical and scientifically sound oral presentation on a topic in Biology. (1, 7, 8)

III. Career

Students completing the BA or BS major in Biology will:

1. Be encouraged to pursue research experiences both on and off campus. (1, 9)
2. Be educated about the wide variety of career paths in Biology via seminars and invited speakers.

Faculty in the department will provide strong personalized advising allowing students to make informed post-graduation decisions.

Non-STEM students fulfilling their natural sciences requirements will:

1. Demonstrate a familiarity with biological principles and practices. (4, 6, 8, 9)
2. Appreciate the impact of biology on society and gain confidence in their ability to understand biologically related issues. (4, 6, 8, 9)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

BIOL 103. DNA & Decision Making. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This is an "Inside-Out" course, taught in a local prison with both Bucknell and incarcerated students. Topics include the basic biology of DNA and the uses and misuses of technology related to DNA and genetics (e.g. genetically modified foods, genetic testing, genetic manipulations, DNA and the legal system). Preference for majors that are not biology-related. Prerequisite: Permission of the Instructor.

BIOL 113. The Hidden Secrets of Genomes. 1 Credit.
Offered Occasionally; Lecture hours:2,Other:6
Learn the secrets of life by studying viral genomes (with an emphasis on the coronavirus causing COVID-19), bacterial genomes, and eukaryotic genomes; and special features that make life possible. This is an introductory-level laboratory course with no prerequisites. Students need access to a kitchen and a computer with internet connection.

BIOL 115. Freshwater Biology. 1 Credit.
Offered Summer Session Only; Lecture hours:4,Other:4
Freshwater ecosystems hold an amazing diversity of life, which provides humans with clean water, food resources, recreational opportunities and other benefits. However, human development impacts water quality, degrades aquatic habitats, blocks river systems and introduces non-native species. In this course, students will learn about organisms living in freshwater ecosystems, changes.

BIOL 121. Biology for Non-majors. 1 Credit.
Offered Either Fall or Spring,TLC Tutoring Course; Lecture hours:3,Lab:3; May require dissection or live animal experimentation
Introductory course primarily for the non-science major. Focuses on life at the cellular and biochemical levels, genetics, and biotechnology. This course is not appropriate preparation for the majority of pre-health graduate programs. Please consult with the Pre-health Adviser for more information.

BIOL 122. Biology for Non-majors. 1 Credit.
Offered Either Fall or Spring,TLC Tutoring Course; Lecture hours:3,Lab:3; May require dissection or live animal experimentation
Introductory course primarily for the non-science major. Topics covered include principles of ecology, evolution, animal diversity, behavior, and structure, and function. This course is not appropriate preparation for the majority of pre-health graduate programs. Please consult with the Pre-health Adviser for more information.

BIOL 132. Science of Sex. 1 Credit.
Offered Summer Session Only; Lecture hours:3
Sex, Gender, Reproduction and Sexuality are powerful and interlinked parts of the human experience. This course serves as an introduction to the science underlying reproductive biology and sexology.

BIOL 136. Introduction to Infectious Diseases. 1 Credit.
Offered Summer Session Only; Lecture hours:6
Infectious diseases affect our health and well-being. This non-majors course explores the biology of three main types of microorganisms that cause diseases in humans – bacteria, viruses and parasites. Course will integrate popular and scientific sources and include a variety of student activities including case studies and short hands-on lab activities. Open to BCCSP only. Prerequisite: permission of the instructor.

BIOL 150. Plants, People, and the Environment. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
The diversity and evolution of plants, fungi, and related organisms with special emphasis on flowering plants; their importance for food, fiber, medicine, and psychoactive compounds; origins of agriculture; domestication of plants; and the role of plants in the environment.

BIOL 1NT. Biology Non-traditional Study. .5-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in Biology. Prerequisite: permission of the instructor.

BIOL 201. Biological Inquiries and Observations. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A seminar-style course focused around a major theme in biology to teach advanced reasoning skills and key topics in evolution, biodiversity, central dogma of molecular biology, scientific study design, and science communication. First or second core course for Biology majors. First-year students only.

BIOL 202. Course-based Undergraduate Research Experience. 1 Credit.
Offered Either Fall or Spring; Lecture hours:2,Other:3
Course-based Undergraduate Research Experience. An authentic research experience using student-designed experiments to test hypotheses. First or second core course for Biology majors. First-year students only.

BIOL 203. Integrated Concepts in Biology Fall. 1 Credit.
Offered Fall Semester Only,TLC Tutoring Course; Lecture hours:3,Other:5; May require dissection or live animal experimentation
An overview of the core concepts in biology using an interdisciplinary approach that highlights connections across the diverse fields of molecular, physiological, ecological, and evolutionary biology. Complements BIOL 204. Typically third core course for Biology majors. Not open to first-year students.

BIOL 204. Integrated Concepts in Biology Spring. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3,Lab:3; May require dissection or live animal experimentation
An overview of the core concepts in biology using an interdisciplinary approach that highlights connections across the diverse fields of molecular, physiological, ecological, and evolutionary biology. Complements BIOL 203. Typically fourth core course for Biology majors.

BIOL 220. Human Anatomy & Physiology I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2; May require dissection or live animal experimentation
Introduction to human anatomy and physiology. Emphasis on the relationship between structure/function of the integumentary, musculoskeletal, nervous, and endocrine systems. Overview of anatomical terminology, cellular and tissue structures, and chemistry will be discussed. Does not count toward the biology major. Lab involves cat dissection.

BIOL 221. Human Physiology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
A course that focuses on the functions of and interactions between human organ systems. Does not count toward the biology major. Prerequisite: permission of the instructor.

BIOL 222. Human Anatomy & Physiology II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2; May require dissection or live animal experimentation
Introduction to human anatomy and physiology. Emphasis on the relationship between structure/function of the blood, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems. May require dissection or live animal experimentation. Does not count toward the biology major. Lab involves cat dissection. Prerequisite: permission of the instructor.

BIOL 235. Microbiology for Health Professions. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3,Other:3
This course will introduce students to the diversity of microorganisms by covering properties of eukaryotic and prokaryotic organisms, microbial genetics and biochemistry, and roles of microbes in disease. Labs will provide experience with common microbiology lab techniques: microscopy, identification, sterile technique, cell culture and plating, and staining methods.

BIOL 266. Animal Behavior. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A survey of important theories, issues, and empirical techniques in the interdisciplinary field of animal behavior emphasizing both proximate and ultimate mechanisms and explanations for behavior. Crosslisted as ANBE 266 and PSYC 266.

BIOL 2NT. Biology Non-traditional Study. 1-2 Credits.
Lecture hours:Varies,Other:Varies
Nontraditional study in biology.

BIOL 302. Microbiology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:4
Ultra-structure, behavior, metabolism, molecular biology, and development of micro-organisms. Roles in disease and food production. Laboratory will emphasize cultivation and identification. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 602.

BIOL 303. Vertebrate Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Vertebrate ecology explores how vertebrates interact with their physical environment from individual to global scales. We will overview the major clades of vertebrates, including a discussion about how environments in which they live shapes their anatomy, physiology and behavior. We will also cover population dynamics and community structures. Prerequisites: (BIOL 203 and BIOL 204) or (ANBE/BIOL/PSYC 266) and instructor permission. Crosslisted as ANBE 303, ANBE 603 and BIOL 603.

BIOL 305. Vertebrate Ecology- with Lab. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
An upper-level laboratory course covering topics in Vertebrate Animal Ecology. Subfields of ecology to be determined by the instructor. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 305, ANBE 605 and BIOL 605.

BIOL 306. Biology of Host-Microbe Interactions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Through study of the primary literature, this course will investigate the relationship between animals and their microbes, including evolution of host-microbe relationships, the impact of microbes on human health, the techniques used to study the microbiota, the biology of the microbiome, and other recent advances in the field. Crosslisted as BIOL 606.

BIOL 307. Conservation Genetics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
As biodiversity has quickly eroded for the past few centuries, some scientists argue that humans are causing the 6th mass extinction event. This course emphasizes the application of population genetics, molecular phylogenetics, and reproductive genetics to answering biological questions in wildlife conservation. Prerequisites: (BIOL 203 and BIOL 204) or (BIOL 207 and BIOL 208). Crosslisted as ANBE 307 and ANBE 607 and BIOL 607.

BIOL 308. Microbial Genetics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Course focuses on molecular genetics of bacteria and archaea and the use of genetic tools to answer questions in microbiology. Primary literature will be used extensively. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. BIOL 327 strongly recommended. Crosslisted as BIOL 608.

BIOL 309. Wildlife and Emerging Diseases. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Biology of wildlife diseases, especially zoonoses (infections that jump to humans). Course will integrate popular and scientific sources. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 309, ANBE 609 and BIOL 609.

BIOL 312. Comparative Vertebrate Anatomy. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3; May require dissection or live animal experimentation
Gross morphology with emphasis on functional and evolutionary modifications of animal structure. Gross dissection and techniques used in morphology. Prerequisites: BIOL 122 or (BIOL 203 and BIOL 204) and permission of the instructor. Crosslisted as ANBE 312, ANBE 612 and BIOL 612.

BIOL 313. Mammalogy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3; May require dissection or live animal experimentation
Biology of mammals, including evolution, classification, biodiversity, behavior, anatomy, physiology, ecology and conservation. Lab will include specimen identification, preparation and field studies. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 313, ANBE 613 and BIOL 613.

BIOL 314. Amphibian Biology and Conservation. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3
The biology of amphibians, including classification, physiology, reproduction, ecology, evolution, and conservation. Laboratory section will include identification of amphibians and field work to identify conservation issues surrounding local amphibian populations. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 314 and BIOL 614 and ANBE 614.

BIOL 315. Social Behavior and Sociality. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
As humans, being social is an integrated aspect of our lives that we often take for granted. However, from an evolutionary perspective there are a lot of reasons animals should live alone. In this course we will focus on studying the animals that live in social groups or interact socially.

BIOL 318. Principles of Physiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Emphasizes the breadth of physiology and explores physiological principles of animals from a cellular, organismal, medical and ecological framework. Laboratory focuses on experimental design and independent research. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 318, ANBE 618 and BIOL 618.

BIOL 319. Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary. Crosslisted as BIOL 619.

BIOL 320. Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Topics vary. Crosslisted as BIOL 620.

BIOL 321. Behavioral Ecology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
How have ecological selection pressures (generated by animals' biotic and abiotic environments) shaped the fascinating diversity of animal behaviors? Topics include habitat choice, foraging behavior, defenses against predation, cooperation and competition, sexual selection, and parental care. Heavy emphasis on primary literature and experimental design. Crosslisted as ANBE 321, ANBE 621 and BIOL 621.

BIOL 324. Neurophysiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; May require dissection or live animal experimentation
A course that will explore the different circuits and systems of the brain and the corresponding brain structures. The laboratory portion of the course will include dissection of brain specimens to better visualize the content presented in class. Crosslisted as BIOL 624.

BIOL 325. Evolutionary Genomics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
An exploration of evolutionary questions using large sequencing databases, with an emphasis on developing strategies for computational sequence analysis. Includes review of the primary literature. No coding experience. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 325, ANBE 625 and BIOL 625.

BIOL 327. Molecular Biology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
Synthesis of DNA, RNA, and protein, and the regulation of these processes in both prokaryotic and eukaryotic cells; laboratory experience in the manipulation and analysis of genes. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 627.

BIOL 328. Endocrinology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Problem Session:2
Regulation and function of hormones and their receptors from molecular to organismal levels. Role of hormones in development, physiology and behavior; endocrine disease. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 328, ANBE 628 and BIOL 628.

BIOL 329. Foundations of Genetics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will discuss the mechanisms of heredity from a classical and modern perspective. Topics include the structure, function and molecular nature of the genome, biological variation from mutation and selection, the genetics of populations and the use of genetics as tool in modern Biology in relation to understanding evolution. Crosslisted as BIOL 629.

BIOL 331. Genomics. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:2
A computer research-based course in which students study the structure, content, expression and evolution of genomes. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 631.

BIOL 332. Developmental Neurobiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Developmental neurobiology with a laboratory section. Topics include: neural cell identity determination and differentiation; axon growth and target selection; formation and plasticity of neural connections; behavioral development. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 632 and NEUR 332.

BIOL 334. Limnology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3
The physical, chemical, and biological characteristics of fresh-water communities are studied. Prerequisites: (BIOL 203 and BIOL 204) or ENST 208 and permission of the instructor. Crosslisted as BIOL 634.

BIOL 339. Developmental Biology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3; May require dissection or live animal experimentation
This course provides an introduction to early animal development with emphasis on the molecular, cellular and genetic mechanisms that drive the formation of the embryo. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 639.

BIOL 340. Biochemical Methods. 1 Credit.
Offered Spring Semester Only; Lecture hours:2,Other:6
A course in laboratory techniques including cell fractionation and analysis of proteins and nucleic acids. Spectrophotometry, chromatography, centrifugation, electrophoresis, and methods of molecular cloning are emphasized. Prerequisites: BIOL 203 and BIOL 204 and CHEM 351 and permission of the instructor. Crosslisted as CHEM 358.

BIOL 341. Evolution. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of evolutionary processes, phenomena, and mechanisms. Topics covered may include natural selection, sexual selection, adaptation, evolutionary constraints, speciation, evolution and development, coevolution, behavioral evolution, and macroevolution. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 341 and ANBE 641 and BIOL 641.

BIOL 342. Neuroethology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A course that integrates neurobiology and behavior in natural contexts. Emphasis on signal detection, recognition, discrimination, localization, orientation, and the control of complex acts. Neuronal and hormonal mechanisms, ontogeny and evolution of behavior will be considered. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 342 and ANBE 642 and BIOL 642.

BIOL 347. Virology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
The study of virus structure, genome organization, replication and host-interactions. Emphasis will be on animal and bacterial viruses. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 647.

BIOL 348. Immunology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:3; May require dissection or live animal experimentation
Development and function of the immune system in animals. The immune response in health and disease. Techniques in immunology. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 648.

BIOL 350. Independent Study. 1 Credit.
Lecture hours:Varies,Other:3; Repeatable
Selected topics.

BIOL 351. Field Botany. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:1
Outdoor field experience in plant diversity and ecology. Excursions to natural areas focused on identification, community dynamics, and ecological interactions/adaptations. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 651.

BIOL 352. Cell Biology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:3
Covers bio-membranes, cell growth patterns, cell signaling, the cytoskeleton, cell organelles, and microscopic techniques. Laboratory includes experience with cell culture. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 652.

BIOL 353. Ecosystem Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Interactions between organisms and the physical and chemical environment including nutrient cycling and energy flow, biogeochemistry, and temporal and spatial dynamics of ecosystems. Prerequisites: (BIOL 203 and BIOL 204) or ENST 208, junior or senior status, and permission of the instructor. Crosslisted as ANBE 353, ANBE 653, BIOL 653, ENST 353.

BIOL 354. Tropical Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to tropical ecology including life history strategies of vertebrates and invertebrates, biodiversity management and conservation. Emphasis on class and individual projects, data collection and journal keeping. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 354 and ANBE 654 and BIOL 654.

BIOL 355. Social Insects. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3
Evolution and genetics of social behavior, caste, communication in foraging and colony defense, queen and worker control over reproduction, social homeostasis and population dynamics. Occasionally may be taught as a laboratory science. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 355.

BIOL 357. Ornithology. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
The biology of birds, including evolution, behavior, anatomy, physiology, ecology, and conservation; lab trips focus on identification of birds in the field. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 357 and ANBE 657 and BIOL 657.

BIOL 358. Invertebrate Zoology. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3,Other:3
A survey of the animal phyla covering phylogenetic relationships, functional morphology, ecology, life histories, symbiosis, ontogeny and behavior. Includes hands-on study of organisms in lab and field. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 358, ANBE 658 and BIOL 658.

BIOL 362. Topics in Cell Biology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:1.5
Selected topics in cell biology will be covered in a format (lecture, discussion, demonstration, seminar) that may vary from year to year. Topics may include membrane structure and dynamics, cell signaling, the cytoskeleton, protein synthesis and targeting, the cycle cycle, mitosis, cell-cell interactions and cell-substrate interactions, among others.

BIOL 364. Advanced Data Analysis in Biology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:3
Data exploration and visualization using state-of-the-art computational techniques. Using "big data" from their own research projects or public transcriptomic datasets, students will learn to analyze/visualize complex biological datasets. Lab includes hands-on work with R/virtual reality. No prior programming experience required. Prerequisites: BIOL 203 and BIOL 204 and MATH 216 and permission of the instructor. Crosslisted as ANBE 364, ANBE 664 and BIOL 664.

BIOL 365. Introduction to Microscopy. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:3
This course is designed as an overview of light and electron microscopy, with emphasis placed on the use of instrumentation. Prerequisite: Permission of the instructor. Crosslisted as BIOL 665.

BIOL 367. Plant Ecophysiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
For billions of years, plants and their ancestors have shaped the Earth's ecosystems, atmosphere and climate. We will study the physiological processes that allow plants to take sunlight, water, carbon dioxide and minerals to develop complex organisms from which all other life is possible. Includes a focus on ecological agriculture. Crosslisted as BIOL 667.

BIOL 368. Microbiota-Gut-Brain Axis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Seminar on the microbiota-gut-brain axis. Topics include: microbiome; interaction between the gut, nervous system and animal behaviors; the role of the immune system in gut-brain communication, the microbiota-gut-brain axis and diseases. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 668.

BIOL 370. Primatology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; May require dissection or live animal experimentation
Introduction to research on prosimians, monkeys and apes with emphasis on the evolutionary origin of diversity, habitat use, social structure, social behavior, cognitive abilities and management. Prerequisites: (ANBE 266 or BIOL 266 or PSYC 266) or (BIOL 203 and BIOL 204) and permission of the instructor. Crosslisted as ANBE 370 and ANBE 670 and BIOL 670 and PSYC 370 and PSYC 670.

BIOL 371. Field Entomology. 1 Credit.
Offered Fall Semester Only; Lecture hours:2,Other:2
Introduction to insects in their natural habitats, with emphasis on insect collecting, taxonomy, identification, ecology, and natural history. Students will make a professional-quality insect collection and acquire skills appropriate for biodiversity surveys. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 671.

BIOL 372. Microbial Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will explore the natural history and evolution of microbial communities across environments including soils, oceans and animal hosts. Key topics include community structure and function, biogeography, phylogenomics and community assembly. This course will cultivate a community of learners who apply reasoning and critical thinking skills to analyze impact. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 672.

BIOL 373. Mycology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Biology of fungi, including evolution, classification, biodiversity, ecology, and medical implications. Lab will involve identification, microscopy, culturing techniques, and field collection. Prerequisite: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 673.

BIOL 375. Cellular and Molecular Neurobiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
In this course, we will cover the molecular and cellular mechanisms that drive neuronal function, and include topics such as excitable membrane physiology, synaptic transmission, plasticity and learning. The laboratory provides an evaluation of laboratory techniques relevant to neuroscience and analysis of papers. Crosslisted as NEUR 253 and BIOL 675.

BIOL 376. Animal Nutrition. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the science of nutrition, emphasizing biochemical, physiological and metabolic processes. We'll examine physiological properties of macronutrients, assess health impacts of popular diets and discuss the physiological role of micronutrients. While touching on human health, the focus will be general principles of nutrition that apply to all animals. Prerequisites: BIOL 203 and BIOL 204 and permission of instructor. Crosslisted as ANBE 376, ANBE 676 and BIOL 676.

BIOL 378. Evolutionary Medicine. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar course will explore evolutionary approaches to medical theory and practice, including topics such as the fundamental nature of and relationship between patients and disease, evolution of human defenses to illness, pathogen evolution, cardiovascular disease, cancer, reproductive medicine, and mismatches between the modern environment and the human body. Crosslisted as BIOL 678.

BIOL 382. Mass Extinctions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An upper-level course investigates the past five mass extinctions and the on-going sixth mass extinction of organisms from the perspective of ecology, evolution, and conservation biology. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 382, ANBE 682 and BIOL 682.

BIOL 399. Mentored Undergraduate Research. .5-2 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:Varies; Repeatable; May require dissection or live animal experimentation
Undergraduate research mentored by a faculty member. Prerequisite: permission of the instructor.

BIOL 3NT. Biology Nontraditional Study. .5-2 Credits.
Lecture hours:Varies,Other:Varies
Nontraditional study in biology.

Biophysics

See Physics & Astronomy (p. 263).

Cell Biology/Biochemistry

Faculty

Director: Marie C. Pizzorno

Coordinating Committee: Moria Cairns Chambers, Kenneth A. Field, Matthew B. Heintzelman, Marie C. Pizzorno, David Rovnyak, Sarah Smith, Timothy G. Strein, Rebecca L. Switzer

Other Participating Faculty: Matthew Q. Clark, Julie A. Gates, Mark F. Haussmann, Michael R. Krout, Leocadia V. Paliulis, Emily Stowe

Developed jointly by the biology and chemistry departments, the major in cell biology/biochemistry at Bucknell is interdisciplinary in nature. The bachelor of science major is designed for students who are interested in understanding living organisms at the cellular and molecular level. This course of study provides strong foundations in biology and chemistry and will offer the student the intellectual and the laboratory skills to grapple with questions at the interface of these two disciplines. In addition to a rigorous scientific education, this program enables students to gain a strong background in the liberal arts and to think critically about the impact of biotechnology on social and ethical issues.

The major in cell biology/biochemistry focuses on subdisciplines within biology and chemistry, such as immunology, genetic engineering, nucleic acids, biomembrane function, cell biology of cancer, and enzymology. This program strongly emphasizes independent student research, including seminar programs and hands-on research. A major in cell biology/biochemistry offers students an excellent preparation for careers in biotechnology, biomedical technology, medicine, pharmacology and bioengineering. It also is an excellent foundation for students preparing for entrance into Ph.D. programs in cell and molecular biology or biochemistry, or Ph.D./M.D. programs in medically-related fields.

Cell Biology/Biochemistry Major

The **major** requires:

BIOL 201	Biological Inquiries and Observations [1, 2]	1
BIOL 203	Integrated Concepts in Biology Fall [1]	1
BIOL 204	Integrated Concepts in Biology Spring [1]	1
BIOL 327	Molecular Biology	1
BIOL 340/CHEM 358	Biochemical Methods [1]	1
BIOL 352	Cell Biology	1
CHEM 205	Principles of Chemistry	1

or CHEM 207	Explorations in Chemistry	
CHEM 211	Organic Chemistry I	1
CHEM 212	Organic Chemistry II	1
CHEM 231	Quantitative Analysis	1
CHEM 340	Biological Physical Chemistry	1
or CHEM 341	Physical Chemistry I	
CHEM 351	Biochemistry I	1
PHYS 211	Classical and Modern Physics I	1
PHYS 212	Classical and Modern Physics II	1
MATH 201	Calculus I	1
MATH 202	Calculus II	1
Select three of the following: [3]		3
BIOL 302	Microbiology	
BIOL 306	Biology of Host-Microbe Interactions	
BIOL 308	Microbial Genetics	
BIOL 318	Principles of Physiology	
BIOL 324	Neurophysiology	
BIOL 325	Evolutionary Genomics	
BIOL 328	Endocrinology	
BIOL 329	Foundations of Genetics	
BIOL 331	Genomics	
BIOL 332	Developmental Neurobiology	
BIOL 339	Developmental Biology	
BIOL 347	Virology	
BIOL 348	Immunology	
BIOL 362	Topics in Cell Biology	
BIOL 364	Advanced Data Analysis in Biology	
BIOL 365	Introduction to Microscopy	
BIOL 368	Microbiota-Gut-Brain Axis	
BIOL 375	Cellular and Molecular Neurobiology	
BIOL 399	Mentored Undergraduate Research [4]	
CHEM 313	Synthetic Organic Chemistry	
CHEM 314	Mechanistic Organic Chemistry	
CHEM 317	Special Topics in Organic Chemistry	
CHEM 321	Inorganic Chemistry I	
CHEM 322	Inorganic Chemistry II	
CHEM 327	Special Topics in Inorganic Chemistry	
CHEM 332	Instrumental Analysis	
CHEM 337	Special Topics in Analytical Chemistry	
CHEM 342	Physical Chemistry II	
CHEM 347	Special Topics in Physical Chemistry	
CHEM 352	Biochemistry II	
CHEM 357	Special Topics In Biochemistry	
CHEM 360	Advanced Environmental Chemistry	
CHEM 375	Undergraduate Research [4]	
CHEM 376	Undergraduate Research [4]	
Total Credits		**19**

1 Contributes to satisfying the writing in the major and information literacy requirements.
2 Satisfies the formal presentation requirement.
3 At least one of these biology or chemistry electives must be a laboratory course.
4 One full credit of a research course may be counted as an elective toward the major.

The Culminating Experience requirement will be fulfilled by cell biology/biochemistry students after completing one of the following:

- Enrolling in a 300-level laboratory course in biology during their last three semesters. These classes will utilize inquiry-based learning and require students to demonstrate writing, information literacy and speaking at a level that is appropriate for a graduating cell biology/biochemistry major.
- Registering for independent research in either biology (BIOL 399 Mentored Undergraduate Research), or chemistry (CHEM 375 Undergraduate Research or CHEM 376 Undergraduate Research).
- Completing an honors thesis.

The recommended sequence for the bachelor of science major is as follows:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
BIOL 201	1	BIOL 204	1
CHEM 205 or 207	1	CHEM 211	1
MATH 201	1	MATH 202	1
	3		**3**
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
BIOL 203	1	BIOL 327	1
CHEM 212	1	CHEM 231	1
	2		**2**
Junior			
First Semester	**Credits**	**Second Semester**	**Credits**
BIOL 352	1	BIOL 340 or CHEM 358	1
CHEM 351	1	PHYS 212	1
PHYS 211	1	Elective in biology or chemistry	1
	3		**3**
Senior			
First Semester	**Credits**	**Second Semester**	**Credits**
Elective in biology or chemistry	1	CHEM 340 or 341	1
		Elective in biology or chemistry	1
	1		**2**

Total Credits: 19

Learning Goals (mapped to University Learning Goals)

Majors in Cell Biology/Biochemistry will be able to:

1. Demonstrate a working conceptual knowledge of relevant sub-disciplines of biology and chemistry, including molecular and cell biology, genetics, organismal biology, organic, inorganic, analytical and physical chemistry and biochemistry. (1, 4)
2. Demonstrate laboratory skills in both chemistry and biology. (1, 6)
3. Write a well-organized, logical and scientifically sound research report. (1, 6, 7)
4. Communicate scientific information through a well-organized, logical and scientifically sound oral presentation. (1, 6, 7)
5. Formulate and test hypotheses, critically analyze evidence and draw logical conclusions. (1, 4, 6)
6. Skillfully utilize the scientific literature and databases in biochemistry, molecular and cell biology. (1, 8, 9)
7. Be aware of current research opportunities and career paths at the interface of chemistry and biology. (1, 9)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Biology Courses

BIOL 103. DNA & Decision Making. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This is an "Inside-Out" course, taught in a local prison with both Bucknell and incarcerated students. Topics include the basic biology of DNA and the uses and misuses of technology related to DNA and genetics (e.g. genetically modified foods, genetic testing, genetic manipulations, DNA and the legal system). Preference for majors that are not biology-related. Prerequisite: Permission of the Instructor.

BIOL 113. The Hidden Secrets of Genomes. 1 Credit.
Offered Occasionally; Lecture hours:2,Other:6
Learn the secrets of life by studying viral genomes (with an emphasis on the coronavirus causing COVID-19), bacterial genomes, and eukaryotic genomes; and special features that make life possible. This is an introductory-level laboratory course with no prerequisites. Students need access to a kitchen and a computer with internet connection.

BIOL 115. Freshwater Biology. 1 Credit.
Offered Summer Session Only; Lecture hours:4,Other:4
Freshwater ecosystems hold an amazing diversity of life, which provides humans with clean water, food resources, recreational opportunities and other benefits. However, human development impacts water quality, degrades aquatic habitats, blocks river systems and introduces non-native species. In this course, students will learn about organisms living in freshwater ecosystems, changes.

BIOL 121. Biology for Non-majors. 1 Credit.
Offered Either Fall or Spring,TLC Tutoring Course; Lecture hours:3,Lab:3; May require dissection or live animal experimentation
Introductory course primarily for the non-science major. Focuses on life at the cellular and biochemical levels, genetics, and biotechnology. This course is not appropriate preparation for the majority of pre-health graduate programs. Please consult with the Pre-health Adviser for more information.

BIOL 122. Biology for Non-majors. 1 Credit.
Offered Either Fall or Spring,TLC Tutoring Course; Lecture hours:3,Lab:3; May require dissection or live animal experimentation
Introductory course primarily for the non-science major. Topics covered include principles of ecology, evolution, animal diversity, behavior, and structure, and function. This course is not appropriate preparation for the majority of pre-health graduate programs. Please consult with the Pre-health Adviser for more information.

BIOL 132. Science of Sex. 1 Credit.
Offered Summer Session Only; Lecture hours:3
Sex, Gender, Reproduction and Sexuality are powerful and interlinked parts of the human experience. This course serves as an introduction to the science underlying reproductive biology and sexology.

BIOL 136. Introduction to Infectious Diseases. 1 Credit.
Offered Summer Session Only; Lecture hours:6
Infectious diseases affect our health and well-being. This non-majors course explores the biology of three main types of microorganisms that cause diseases in humans – bacteria, viruses and parasites. Course will integrate popular and scientific sources and include a variety of student activities including case studies and short hands-on lab activities. Open to BCCSP only. Prerequisite: permission of the instructor.

BIOL 150. Plants, People, and the Environment. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
The diversity and evolution of plants, fungi, and related organisms with special emphasis on flowering plants; their importance for food, fiber, medicine, and psychoactive compounds; origins of agriculture; domestication of plants; and the role of plants in the environment.

BIOL 1NT. Biology Non-traditional Study. .5-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in Biology. Prerequisite: permission of the instructor.

BIOL 201. Biological Inquiries and Observations. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A seminar-style course focused around a major theme in biology to teach advanced reasoning skills and key topics in evolution, biodiversity, central dogma of molecular biology, scientific study design, and science communication. First or second core course for Biology majors. First-year students only.

BIOL 202. Course-based Undergraduate Research Experience. 1 Credit.
Offered Either Fall or Spring; Lecture hours:2,Other:3
Course-based Undergraduate Research Experience. An authentic research experience using student-designed experiments to test hypotheses. First or second core course for Biology majors. First-year students only.

BIOL 203. Integrated Concepts in Biology Fall. 1 Credit.
Offered Fall Semester Only,TLC Tutoring Course; Lecture hours:3,Other:5; May require dissection or live animal experimentation
An overview of the core concepts in biology using an interdisciplinary approach that highlights connections across the diverse fields of molecular, physiological, ecological, and evolutionary biology. Complements BIOL 204. Typically third core course for Biology majors. Not open to first-year students.

BIOL 204. Integrated Concepts in Biology Spring. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3,Lab:3; May require dissection or live animal experimentation
An overview of the core concepts in biology using an interdisciplinary approach that highlights connections across the diverse fields of molecular, physiological, ecological, and evolutionary biology. Complements BIOL 203. Typically fourth core course for Biology majors.

BIOL 220. Human Anatomy & Physiology I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2; May require dissection or live animal experimentation
Introduction to human anatomy and physiology. Emphasis on the relationship between structure/function of the integumentary, musculoskeletal, nervous, and endocrine systems. Overview of anatomical terminology, cellular and tissue structures, and chemistry will be discussed. Does not count toward the biology major. Lab involves cat dissection.

BIOL 221. Human Physiology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
A course that focuses on the functions of and interactions between human organ systems. Does not count toward the biology major. Prerequisite: permission of the instructor.

BIOL 222. Human Anatomy & Physiology II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2; May require dissection or live animal experimentation
Introduction to human anatomy and physiology. Emphasis on the relationship between structure/function of the blood, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems. May require dissection or live animal experimentation. Does not count toward the biology major. Lab involves cat dissection. Prerequisite: permission of the instructor.

BIOL 235. Microbiology for Health Professions. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3,Other:3
This course will introduce students to the diversity of microorganisms by covering properties of eukaryotic and prokaryotic organisms, microbial genetics and biochemistry, and roles of microbes in disease. Labs will provide experience with common microbiology lab techniques: microscopy, identification, sterile technique, cell culture and plating, and staining methods.

BIOL 266. Animal Behavior. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A survey of important theories, issues, and empirical techniques in the interdisciplinary field of animal behavior emphasizing both proximate and ultimate mechanisms and explanations for behavior. Crosslisted as ANBE 266 and PSYC 266.

BIOL 2NT. Biology Non-traditional Study. 1-2 Credits.
Lecture hours:Varies,Other:Varies
Nontraditional study in biology.

BIOL 302. Microbiology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:4
Ultra-structure, behavior, metabolism, molecular biology, and development of micro-organisms. Roles in disease and food production. Laboratory will emphasize cultivation and identification. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 602.

BIOL 303. Vertebrate Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Vertebrate ecology explores how vertebrates interact with their physical environment from individual to global scales. We will overview the major clades of vertebrates, including a discussion about how environments in which they live shapes their anatomy, physiology and behavior. We will also cover population dynamics and community structures. Prerequisites: (BIOL 203 and BIOL 204) or (ANBE/BIOL/PSYC 266) and instructor permission. Crosslisted as ANBE 303, ANBE 603 and BIOL 603.

BIOL 305. Vertebrate Ecology- with Lab. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
An upper-level laboratory course covering topics in Vertebrate Animal Ecology. Subfields of ecology to be determined by the instructor. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 305, ANBE 605 and BIOL 605.

BIOL 306. Biology of Host-Microbe Interactions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Through study of the primary literature, this course will investigate the relationship between animals and their microbes, including evolution of host-microbe relationships, the impact of microbes on human health, the techniques used to study the microbiota, the biology of the microbiome, and other recent advances in the field. Crosslisted as BIOL 606.

BIOL 307. Conservation Genetics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
As biodiversity has quickly eroded for the past few centuries, some scientists argue that humans are causing the 6th mass extinction event. This course emphasizes the application of population genetics, molecular phylogenetics, and reproductive genetics to answering biological questions in wildlife conservation. Prerequisites: (BIOL 203 and BIOL 204) or (BIOL 207 and BIOL 208). Crosslisted as ANBE 307 and ANBE 607 and BIOL 607.

BIOL 308. Microbial Genetics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Course focuses on molecular genetics of bacteria and archaea and the use of genetic tools to answer questions in microbiology. Primary literature will be used extensively. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. BIOL 327 strongly recommended. Crosslisted as BIOL 608.

BIOL 309. Wildlife and Emerging Diseases. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Biology of wildlife diseases, especially zoonoses (infections that jump to humans). Course will integrate popular and scientific sources. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 309, ANBE 609 and BIOL 609.

BIOL 312. Comparative Vertebrate Anatomy. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3; May require dissection or live animal experimentation
Gross morphology with emphasis on functional and evolutionary modifications of animal structure. Gross dissection and techniques used in morphology. Prerequisites: BIOL 122 or (BIOL 203 and BIOL 204) and permission of the instructor. Crosslisted as ANBE 312, ANBE 612 and BIOL 612.

BIOL 313. Mammalogy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3; May require dissection or live animal experimentation
Biology of mammals, including evolution, classification, biodiversity, behavior, anatomy, physiology, ecology and conservation. Lab will include specimen identification, preparation and field studies. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 313, ANBE 613 and BIOL 613.

BIOL 314. Amphibian Biology and Conservation. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3
The biology of amphibians, including classification, physiology, reproduction, ecology, evolution, and conservation. Laboratory section will include identification of amphibians and field work to identify conservation issues surrounding local amphibian populations. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 314 and BIOL 614 and ANBE 614.

BIOL 315. Social Behavior and Sociality. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
As humans, being social is an integrated aspect of our lives that we often take for granted. However, from an evolutionary perspective there are a lot of reasons animals should live alone. In this course we will focus on studying the animals that live in social groups or interact socially.

BIOL 318. Principles of Physiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Emphasizes the breadth of physiology and explores physiological principles of animals from a cellular, organismal, medical and ecological framework. Laboratory focuses on experimental design and independent research. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 318, ANBE 618 and BIOL 618.

BIOL 319. Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary. Crosslisted as BIOL 619.

BIOL 320. Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Topics vary. Crosslisted as BIOL 620.

BIOL 321. Behavioral Ecology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
How have ecological selection pressures (generated by animals' biotic and abiotic environments) shaped the fascinating diversity of animal behaviors? Topics include habitat choice, foraging behavior, defenses against predation, cooperation and competition, sexual selection, and parental care. Heavy emphasis on primary literature and experimental design. Crosslisted as ANBE 321, ANBE 621 and BIOL 621.

BIOL 324. Neurophysiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; May require dissection or live animal experimentation
A course that will explore the different circuits and systems of the brain and the corresponding brain structures. The laboratory portion of the course will include dissection of brain specimens to better visualize the content presented in class. Crosslisted as BIOL 624.

BIOL 325. Evolutionary Genomics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
An exploration of evolutionary questions using large sequencing databases, with an emphasis on developing strategies for computational sequence analysis. Includes review of the primary literature. No coding experience. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 325, ANBE 625 and BIOL 625.

BIOL 327. Molecular Biology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
Synthesis of DNA, RNA, and protein, and the regulation of these processes in both prokaryotic and eukaryotic cells; laboratory experience in the manipulation and analysis of genes. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 627.

BIOL 328. Endocrinology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Problem Session:2
Regulation and function of hormones and their receptors from molecular to organismal levels. Role of hormones in development, physiology and behavior; endocrine disease. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 328, ANBE 628 and BIOL 628.

BIOL 329. Foundations of Genetics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will discuss the mechanisms of heredity from a classical and modern perspective. Topics include the structure, function and molecular nature of the genome, biological variation from mutation and selection, the genetics of populations and the use of genetics as tool in modern Biology in relation to understanding evolution. Crosslisted as BIOL 629.

BIOL 331. Genomics. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:2
A computer research-based course in which students study the structure, content, expression and evolution of genomes. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 631.

BIOL 332. Developmental Neurobiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Developmental neurobiology with a laboratory section. Topics include: neural cell identity determination and differentiation; axon growth and target selection; formation and plasticity of neural connections; behavioral development. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 632 and NEUR 332.

BIOL 334. Limnology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3
The physical, chemical, and biological characteristics of fresh-water communities are studied. Prerequisites: (BIOL 203 and BIOL 204) or ENST 208 and permission of the instructor. Crosslisted as BIOL 634.

BIOL 339. Developmental Biology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3; May require dissection or live animal experimentation
This course provides an introduction to early animal development with emphasis on the molecular, cellular and genetic mechanisms that drive the formation of the embryo. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 639.

BIOL 340. Biochemical Methods. 1 Credit.
Offered Spring Semester Only; Lecture hours:2,Other:6
A course in laboratory techniques including cell fractionation and analysis of proteins and nucleic acids. Spectrophotometry, chromatography, centrifugation, electrophoresis, and methods of molecular cloning are emphasized. Prerequisites: BIOL 203 and BIOL 204 and CHEM 351 and permission of the instructor. Crosslisted as CHEM 358.

BIOL 341. Evolution. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of evolutionary processes, phenomena, and mechanisms. Topics covered may include natural selection, sexual selection, adaptation, evolutionary constraints, speciation, evolution and development, coevolution, behavioral evolution, and macroevolution. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 341 and ANBE 641 and BIOL 641.

BIOL 342. Neuroethology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A course that integrates neurobiology and behavior in natural contexts. Emphasis on signal detection, recognition, discrimination, localization, orientation, and the control of complex acts. Neuronal and hormonal mechanisms, ontogeny and evolution of behavior will be considered. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 342 and ANBE 642 and BIOL 642.

BIOL 347. Virology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
The study of virus structure, genome organization, replication and host-interactions. Emphasis will be on animal and bacterial viruses. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 647.

BIOL 348. Immunology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:3; May require dissection or live animal experimentation
Development and function of the immune system in animals. The immune response in health and disease. Techniques in immunology. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 648.

BIOL 350. Independent Study. 1 Credit.
Lecture hours:Varies,Other:3; Repeatable
Selected topics.

BIOL 351. Field Botany. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:1
Outdoor field experience in plant diversity and ecology. Excursions to natural areas focused on identification, community dynamics, and ecological interactions/adaptations. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 651.

BIOL 352. Cell Biology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:3
Covers bio-membranes, cell growth patterns, cell signaling, the cytoskeleton, cell organelles, and microscopic techniques. Laboratory includes experience with cell culture. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 652.

BIOL 353. Ecosystem Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Interactions between organisms and the physical and chemical environment including nutrient cycling and energy flow, biogeochemistry, and temporal and spatial dynamics of ecosystems. Prerequisites: (BIOL 203 and BIOL 204) or ENST 208, junior or senior status, and permission of the instructor. Crosslisted as ANBE 353, ANBE 653, BIOL 653, ENST 353.

BIOL 354. Tropical Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to tropical ecology including life history strategies of vertebrates and invertebrates, biodiversity management and conservation. Emphasis on class and individual projects, data collection and journal keeping. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 354 and ANBE 654 and BIOL 654.

BIOL 355. Social Insects. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:3
Evolution and genetics of social behavior, caste, communication in foraging and colony defense, queen and worker control over reproduction, social homeostasis and population dynamics. Occasionally may be taught as a laboratory science. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 355.

BIOL 357. Ornithology. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
The biology of birds, including evolution, behavior, anatomy, physiology, ecology, and conservation; lab trips focus on identification of birds in the field. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 357 and ANBE 657 and BIOL 657.

BIOL 358. Invertebrate Zoology. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3,Other:3
A survey of the animal phyla covering phylogenetic relationships, functional morphology, ecology, life histories, symbiosis, ontogeny and behavior. Includes hands-on study of organisms in lab and field. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 358, ANBE 658 and BIOL 658.

BIOL 362. Topics in Cell Biology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:1.5
Selected topics in cell biology will be covered in a format (lecture, discussion, demonstration, seminar) that may vary from year to year. Topics may include membrane structure and dynamics, cell signaling, the cytoskeleton, protein synthesis and targeting, the cycle cycle, mitosis, cell-cell interactions and cell-substrate interactions, among others.

BIOL 364. Advanced Data Analysis in Biology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:3
Data exploration and visualization using state-of-the-art computational techniques. Using “big data” from their own research projects or public transcriptomic datasets, students will learn to analyze/visualize complex biological datasets. Lab includes hands-on work with R/virtual reality. No prior programming experience required. Prerequisites: BIOL 203 and BIOL 204 and MATH 216 and permission of the instructor. Crosslisted as ANBE 364, ANBE 664 and BIOL 664.

BIOL 365. Introduction to Microscopy. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:3
This course is designed as an overview of light and electron microscopy, with emphasis placed on the use of instrumentation. Prerequisite: Permission of the instructor. Crosslisted as BIOL 665.

BIOL 367. Plant Ecophysiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
For billions of years, plants and their ancestors have shaped the Earth’s ecosystems, atmosphere and climate. We will study the physiological processes that allow plants to take sunlight, water, carbon dioxide and minerals to develop complex organisms from which all other life is possible. Includes a focus on ecological agriculture. Crosslisted as BIOL 667.

BIOL 368. Microbiota-Gut-Brain Axis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Seminar on the microbiota-gut-brain axis. Topics include: microbiome; interaction between the gut, nervous system and animal behaviors; the role of the immune system in gut-brain communication, the microbiota-gut-brain axis and diseases. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 668.

BIOL 370. Primatology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; May require dissection or live animal experimentation
Introduction to research on prosimians, monkeys and apes with emphasis on the evolutionary origin of diversity, habitat use, social structure, social behavior, cognitive abilities and management. Prerequisites: (ANBE 266 or BIOL 266 or PSYC 266) or (BIOL 203 and BIOL 204) and permission of the instructor. Crosslisted as ANBE 370 and ANBE 670 and BIOL 670 and PSYC 370 and PSYC 670.

BIOL 371. Field Entomology. 1 Credit.
Offered Fall Semester Only; Lecture hours:2,Other:2
Introduction to insects in their natural habitats, with emphasis on insect collecting, taxonomy, identification, ecology, and natural history. Students will make a professional-quality insect collection and acquire skills appropriate for biodiversity surveys. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 671.

BIOL 372. Microbial Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will explore the natural history and evolution of microbial communities across environments including soils, oceans and animal hosts. Key topics include community structure and function, biogeography, phylogenomics and community assembly. This course will cultivate a community of learners who apply reasoning and critical thinking skills to analyze impact. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 672.

BIOL 373. Mycology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Biology of fungi, including evolution, classification, biodiversity, ecology, and medical implications. Lab will involve identification, microscopy, culturing techniques, and field collection. Prerequisite: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 673.

BIOL 375. Cellular and Molecular Neurobiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
In this course, we will cover the molecular and cellular mechanisms that drive neuronal function, and include topics such as excitable membrane physiology, synaptic transmission, plasticity and learning. The laboratory provides an evaluation of laboratory techniques relevant to neuroscience and analysis of papers. Crosslisted as NEUR 253 and BIOL 675.

BIOL 376. Animal Nutrition. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the science of nutrition, emphasizing biochemical, physiological and metabolic processes. We'll examine physiological properties of macronutrients, assess health impacts of popular diets and discuss the physiological role of micronutrients. While touching on human health, the focus will be general principles of nutrition that apply to all animals. Prerequisites: BIOL 203 and BIOL 204 and permission of instructor. Crosslisted as ANBE 376, ANBE 676 and BIOL 676.

BIOL 378. Evolutionary Medicine. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar course will explore evolutionary approaches to medical theory and practice, including topics such as the fundamental nature of and relationship between patients and disease, evolution of human defenses to illness, pathogen evolution, cardiovascular disease, cancer, reproductive medicine, and mismatches between the modern environment and the human body. Crosslisted as BIOL 678.

BIOL 382. Mass Extinctions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An upper-level course investigates the past five mass extinctions and the on-going sixth mass extinction of organisms from the perspective of ecology, evolution, and conservation biology. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as ANBE 382, ANBE 682 and BIOL 682.

BIOL 399. Mentored Undergraduate Research. .5-2 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:Varies; Repeatable; May require dissection or live animal experimentation
Undergraduate research mentored by a faculty member. Prerequisite: permission of the instructor.

BIOL 3NT. Biology Nontraditional Study. .5-2 Credits.
Lecture hours:Varies,Other:Varies
Nontraditional study in biology.

Chemistry Courses

CHEM 105. Introduction to Chemistry. 1 Credit.
Offered Either Fall or Spring,TLC Tutoring Course; Lecture hours:3,Lab:3
A terminal elementary course covering in-depth selected topics, which may vary from year to year. Satisfies science requirement for Bachelor of Arts students not majoring in science or engineering. Not open to students who have taken CHEM 160 or any 200-level CHEM course. Prerequisite: seniors by permission only.

CHEM 107. Chemistry of Cooking. 1 Credit.
Offered Summer Session Only; Lecture hours:4,Other:3
This course will introduce students to the fundamental principles of chemistry in the context of cooking and food preparation. Students will analyze and solve food-related questions using chemistry concepts, create their own recipes by understanding the scientific interactions between ingredients and cooking methods and gain appreciation for the science behind cooking.

CHEM 131. What's That Smell?. 1 Credit.
Offered Occasionally; Lecture hours:3,Lab:3
Our sense of smell is an exquisite chemical detector that guides us to delicious foods, away from potential threats, and triggers memories of lived experiences. This course explores the many sources of smells in our environment, how we detect smelly chemicals, and how scents can be grouped using chemical thinking.

CHEM 203. General Chemistry for Engineers. 1 Credit.
Offered Fall Semester Only,TLC Tutoring Course; Lecture hours:3,Other:4
Fundamental principles in inorganic chemistry including aqueous reactions, atomic and molecular structure, coordination compounds, solids, liquids, and gases, and basic equilibrium. Laboratory experiments are both qualitative and quantitative.

CHEM 205. Principles of Chemistry. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3,Other:4
First college chemistry course for most students. Introduction to chemical principles. Prerequisite: high school chemistry or equivalent. Credit not given for both CHEM 205 and CHEM 207.

CHEM 207. Explorations in Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:3,Lab:5
Advanced introductory chemistry course for students with a strong chemistry background. Inquiry based projects and lab experiences. Students seeking permission to take CHEM 207 (instead of CHEM 205) must take the online placement test. Credit not given for both CHEM 207 and CHEM 205.

CHEM 211. Organic Chemistry I. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3,Other:4
First-year, second-semester course for students majoring in chemistry, biochemistry, and biology. Bonding and structure in organic compounds, resonance, organic acid/base reactions, basic nomenclature, conformational analysis, stereochemistry, properties and reactions of functional groups. Prerequisite: CHEM 203 or CHEM 205 or CHEM 207 or permission of instructor.

CHEM 212. Organic Chemistry II. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3,Other:4
A continuation of CHEM 211 with focus on properties and reactions of functional groups, synthesis, and spectroscopic analysis. Prerequisite: CHEM 211.

CHEM 230. Principles of Chemistry 2. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3,Other:4
Quantitative topics in equilibrium, acid-base chemistry, solubility, and electrochemistry, solid state crystal structures, coordination complexes, and nuclear chemistry are introduced. Especially appropriate for life-science students. Prerequisite: CHEM 203, or CHEM 205, or CHEM 207. Students may take only one of these for credit: CHEM 230, CHEM 231, or CHEM 233.

CHEM 231. Quantitative Analysis. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3,Other:5
Chemical equilibrium and modern analysis with an emphasis on acid-base systems, solubility, metal ion determinations, electroanalytical chemistry, spectrophotometry, and separation methods. Prerequisite: CHEM 203, or CHEM 205 or CHEM 207. Students may take only one of the following courses for credit: CHEM 230, CHEM 231 or CHEM 233.

CHEM 233. Analytical Chemistry for Engineers. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:4
Chemical equilibrium and modern analysis with an emphasis on acid-base systems, solubility, metal ion determinations, electroanalytical chemistry, and spectrophotometry. College of Engineering students only. Prerequisite: CHEM 205 or CHEM 207, or by instructor permission. Students may take only one of these for credit: CHEM 230, CHEM 231, or CHEM 233.

CHEM 2NT. Chemistry Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in chemistry. Prerequisite: permission of the instructor.

CHEM 313. Synthetic Organic Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:3,Recitation:1
Modern synthetic organic chemistry, with examples involving complex natural products. Application of organic mechanism, synthetic strategy, and advanced transformations to total synthesis. Prerequisite: CHEM 212. Crosslisted as CHEM 613.

CHEM 314. Mechanistic Organic Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4
Thermal and kinetic aspects of organic reactions are discussed along with the effect of substituents, solvents, and stereochemistry on reaction pathways. Qualitative molecular orbital theory of organic compounds is covered in depth. Weekly problem sessions are held. Prerequisite: CHEM 212. Crosslisted as CHEM 614.

CHEM 317. Special Topics in Organic Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4; Repeatable
Topics vary. Prerequisite: CHEM 212 or permission of the instructor. Crosslisted as CHEM 617.

CHEM 321. Inorganic Chemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:5
Structures and reactivity of inorganic systems. Emphasizes hands-on, experiential learning in workshops and laboratory. Prerequisites: CHEM 211 and CHEM 231 or permission of the instructor. Crosslisted as CHEM 621.

CHEM 322. Inorganic Chemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:5
Survey course in modern inorganic chemistry covering transition metal, coordination, organometallic, and bioinorganic chemistry. Laboratory will consist of synthetic and physical measurements as well as the manipulation of air sensitive materials. Prerequisite: CHEM 321 or permission of the instructor. Crosslisted as CHEM 622.

CHEM 327. Special Topics in Inorganic Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4; Repeatable
Topics vary. Prerequisite: CHEM 321 or permission of the instructor. Crosslisted as CHEM 627.

CHEM 332. Instrumental Analysis. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:5
Theory and practice of techniques of instrumental analysis including spectrophotometry, fluorescence, mass spectrometry, atomic absorption, chromatography, capillary electrophoresis and dynamic electrochemistry. Prerequisite: CHEM 231. Crosslisted as CHEM 632.

CHEM 337. Special Topics in Analytical Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4
Topics vary. Prerequisite: CHEM 231 or permission of the instructor. Crosslisted as CHEM 637.

CHEM 340. Biological Physical Chemistry. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:6
Introduction to physical chemistry for life science students, with emphasis on thermodynamics, hydrodynamics and spectroscopy. Not open to B.S. chemistry majors. Prerequisites: CHEM 231, MATH 201, and PHYS 211P. MATH 202 and PHYS 212 are recommended. Crosslisted as CHEM 640.

CHEM 341. Physical Chemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:5
Survey of physical chemistry including introductory thermodynamics, quantum mechanics, spectroscopy, kinetics, and statistical mechanics. Prerequisites: CHEM 231, MATH 211, and PHYS 212. Crosslisted as CHEM 641.

CHEM 342. Physical Chemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:5
Introductory physical chemistry with emphasis on quantum mechanics, structure and bonding, molecular spectroscopy and statistical mechanics. The customized laboratory experience will emphasize applications of spectroscopy and computational methods. Prerequisite: CHEM 341. Crosslisted as CHEM 642.

CHEM 343. Physical Chemistry for Engineers. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Introductory physical chemistry for engineers, with emphasis on thermodynamics, chemical kinetics and electrochemistry. Prerequisites: CHEM 231 or CHEM 233, MATH 211, PHYS 211. Only open to engineering majors.

CHEM 347. Special Topics in Physical Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4
Topics vary. Prerequisite: CHEM 230 or CHEM 231 or permission of the instructor. Crosslisted as CHEM 647.

CHEM 351. Biochemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Introduction to biological chemistry with emphasis on the structure and function of proteins, lipids, carbohydrates and nucleic acids, kinetics and mechanisms of enzymes, bioenergetics, and metabolism. Prerequisites: CHEM 212 and either CHEM 230 or CHEM 231. Crosslisted as CHEM 651.

CHEM 352. Biochemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Advanced topics in protein structure and function, protein folding, enzyme mechanisms, electron transport and free-energy coupling mechanisms, biosynthesis, metabolic regulation, and supramolecular assemblies. Prerequisite: CHEM 351 or permission of the instructor. Crosslisted as CHEM 652.

CHEM 357. Special Topics In Biochemistry. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:1
Structure/function relationships and dynamics of biomolecules. Prerequisite: permission of the instructor. Crosslisted as CHEM 657.

CHEM 358. Biochemical Methods. 1 Credit.
Offered Spring Semester Only; Lecture hours:2,Other:6
A course in laboratory techniques including cell fractionation, protein, and nucleic acid analysis. Spectrophotometry, chromatography, centrifugation, electrophoresis, and mass spectrometry are emphasized. Prerequisites: BIOL 203 and BIOL 204 and CHEM 351 and permission of the instructor. Crosslisted as BIOL 340.

CHEM 360. Advanced Environmental Chemistry. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:4
Chemistry of the atmosphere, hydrosphere, and lithosphere. Natural processes and anthropogenic effects will be discussed. Prerequisite: CHEM 230 or CHEM 231 or permission of the instructor. Crosslisted as CHEM 660.

CHEM 365. Atmospheric Chemistry and Physics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Addresses the relationships of chemistry, physics, and engineering principles in understanding processes in the Earth's atmosphere. Topics include overview of the Earth's atmospheric history and problems of current environmental concerns including urban ozone, acid rain, particulate pollution, and global change. Crosslisted as CHEG 455 and CHEG 655.

CHEM 375. Undergraduate Research. .5-2 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Original investigations in analytical, biological, organic, physical, environmental or inorganic chemistry.

CHEM 376. Undergraduate Research. .5-2 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Original investigations in analytical, biological, organic, physical, environmental or inorganic chemistry.

CHEM 385. Seminar. .5 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Topics vary. Crosslisted as CHEM 685.

CHEM 386. Seminar. .5 Credits.
Offered Spring Semester Only; Lecture hours:2; Repeatable
Topics vary. Crosslisted as CHEM 686.

Chemistry

Faculty

Professors: Karen J. Castle, David Rovnyak (Co-chair), Robert A. Stockland, Timothy G. Strein

Associate Professors: Dabrina Dutcher, William D. Kerber, Michael R. Krout, Molly M. McGuire (Co-chair), Rebecca L. Switzer

Assistant Professors: Hasan Arslan, Douglas Collins, Ashan Fernando (Teaching), Yan Choi Lam, Brian Jacob Smith, Sarah Smith

Visiting Assistant Professors: Thomas Green, Shruti Mendiratta

Laboratory Directors: Kaitlyn Connelly, Erica Merriett, Neluni Perera

Chemistry is the science that seeks to understand the structure and composition of matter and the changes that it undergoes. The atomic/molecular perspective of chemistry provides fundamental insight into the macroscopic world of materials and organisms. Chemists apply this insight in many ways, such as the synthesis of new substances with useful technological or therapeutic properties and the discovery of new analytical methods that can be used in medicine and environmental science. Coursework in chemistry introduces students to fundamental chemical principles, teaches students to apply these principles broadly and effectively, and enables students to evaluate critically the impact of chemistry on society.

In addition to providing a working knowledge of chemical principles, a major in chemistry offers experience in critical thinking, data analysis and experimental design. Chemistry graduates pursue a variety of careers in which these skills are important. Many work as chemists in chemical or pharmaceutical companies or in government labs. Others apply their chemical skills to careers in medicine, law, business, chemical or pharmaceutical sales, biotechnology, pharmacology, toxicology or environmental science. Many chemistry graduates pursue careers in education at the secondary, college or university level.

The department emphasizes the importance of research experience. The opportunity to engage in an original research investigation in collaboration with a faculty member is a distinctive feature of this program.

The chemistry major may be pursued under the bachelor of arts or the bachelor of science degree programs. Students interested in biochemistry should consider either the Bachelor of Science in Chemistry curriculum with biochemistry and biology electives or the bachelor of science program in cell biology/biochemistry offered jointly by the chemistry and biology departments.

Bachelor of Arts Major

A **Bachelor of Arts major** consists of 10 course credits and a Culminating Experience.

Required Courses		
CHEM 205	Principles of Chemistry	1
or CHEM 207	Explorations in Chemistry	
CHEM 211	Organic Chemistry I	1

CHEM 212	Organic Chemistry II	1
CHEM 231	Quantitative Analysis	1
CHEM 321	Inorganic Chemistry I	1
CHEM 340	Biological Physical Chemistry	1
or CHEM 341	Physical Chemistry I	
MATH 201	Calculus I [1]	1
PHYS 211	Classical and Modern Physics I [2]	1
Culminating Experience [3]		0-.5
Electives		
2 CHEM courses numbered 300 level or above [4]		2

1 MATH 202 Calculus II is strongly recommended.
2 PHYS 212 Classical and Modern Physics II is strongly recommended.
3 Satisfying Disciplinary Depth Component of the College of Arts & Sciences Core Curriculum.
4 A maximum of one course credit of CHEM 375 Undergraduate Research or CHEM 376 Undergraduate Research may count toward the major.

Bachelor of Science Major

A **Bachelor of Science major** consists of 16 course credits and a Culminating Experience.

Required Courses		
CHEM 205	Principles of Chemistry	1
or CHEM 207	Explorations in Chemistry	
CHEM 211	Organic Chemistry I	1
CHEM 212	Organic Chemistry II	1
CHEM 231	Quantitative Analysis	1
CHEM 321	Inorganic Chemistry I	1
CHEM 341	Physical Chemistry I	1
MATH 201	Calculus I	1
MATH 202	Calculus II	1
MATH 211	Calculus III	1
PHYS 211	Classical and Modern Physics I	1
PHYS 212	Classical and Modern Physics II	1
Select two of the following 300-level courses with lab: [1]		**2**
CHEM 322	Inorganic Chemistry II	
CHEM 332	Instrumental Analysis	
CHEM 342	Physical Chemistry II	
Electives		
3 additional CHEM courses numbered 300 level or above		3
Culminating Experience [2]		0-.5

1 Students who intend to go to graduate school in the chemical sciences are advised to take all three of the 300-level courses with lab.
2 Satisfying Disciplinary Depth Component of the College of Arts & Sciences Core Curriculum (CASCC).

The sequence of chemistry courses indicated below is strongly recommended for the first four semesters. Students who plan to study abroad or have other scheduling constraints should discuss alternatives for the last four semesters with their adviser.

The recommended sequence for the Bachelor of Science major is as follows:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
CHEM 205 or 207	1	CHEM 211	1
MATH 201	1	MATH 202	1
	2		**2**

Sophomore

First Semester	Credits	Second Semester	Credits
CHEM 212	1	CHEM 231	1
MATH 211	1	PHYS 212	1
PHYS 211	1		
	3		**2**

Junior

First Semester	Credits	Second Semester	Credits
CHEM 321	1	300-level course with lab	1
CHEM 341	1	Elective in chemistry	1
	2		**2**

Senior

First Semester	Credits	Second Semester	Credits
300-level course with lab	1	Elective in chemistry[1]	1
Elective in chemistry	1		
	2		**1**

Total Credits: 16

[1] An additional 300-level course with lab is recommended for those going to graduate school.

Electives in chemistry may be chosen from any of the 300-level undergraduate courses in chemistry. Students who intend to go to graduate school in the chemical sciences are advised to take all three of the 300-level lab courses (CHEM 322 Inorganic Chemistry II, CHEM 332 Instrumental Analysis and CHEM 342 Physical Chemistry II).

For the BS degree, no more than 1.5 credits of research, CHEM 375 Undergraduate Research or CHEM 376 Undergraduate Research, may be applied toward the major.

Advanced placement credit accepted by the University will count as a credit toward graduation but will not replace the number of chemistry courses above 205 that are required for a major in chemistry.

Transfer students who are given at least 1.5 transfer credits toward graduation based on two semesters of general chemistry taken before transfer will be given an adjustment such that those two courses will replace the specific requirement for CHEM 205 Principles of Chemistry and will count as one of the chemistry courses required for the chemistry degree.

Bachelor of science graduates will not automatically achieve the American Chemical Society's certification. To fulfill these requirements, bachelor of science chemistry students should take the equivalent of at least two additional laboratory or research courses and CHEM 351 Biochemistry I.

The department offers a combined B.S./M.S. program for students who desire more research and more advanced chemistry courses than are obtainable under the bachelor of science program. The B.S./M.S. program normally is elected in the sophomore year and is completed in the summer following the senior year. Interested students should consult with the department chair.

Satisfying Disciplinary Depth Component of the College of Arts & Sciences Core Curriculum

Culminating Experience

Chemistry majors (B.S. and B.A.) will meet the Culminating Experience requirement in one of the following ways. Normally completed during the senior year, Culminating Experiences may also be completed by second-semester juniors with departmental approval.

- Carry out a research project in the chemical sciences and give a formal presentation, in either oral or poster format, about the project. The presentation may occur off-campus at a conference or on-campus at the Kalman Research Symposium or another University-sponsored event. Arrangements may also be made for a presentation as part of the Chemistry Department's seminar series. The research component can be either of the following:
  a. at least one credit of undergraduate research (CHEM 375 Undergraduate Research or CHEM 376 Undergraduate Research), or other research experience completed during the academic year, with department approval, or
  b. a summer research project carried out either at Bucknell or elsewhere (research projects carried out elsewhere must have prior approval by the department).

- Take one of the 0.5-credit special topics seminar courses (CHEM 385 Seminar or CHEM 386 Seminar) that the department offers. These seminars apply principles that students have learned in their core chemistry courses to topics of current interest, and require each student to give a formal presentation.

Writing Within the Major

The writing requirement within the major can be satisfied with CHEM 332 Instrumental Analysis or CHEM 342 Physical Chemistry II. All chemistry majors are required to take either CHEM 340 Biological Physical Chemistry or CHEM 341 Physical Chemistry I, both of which involve writing formal lab reports.

Formal Presentation Experience

Each of the ways in which B.A. and B.S. chemistry majors can satisfy the Culminating Experience requirement will require formal presentation(s) under the guidance of the research mentor or seminar course instructor.

Information Literacy

Any 0.5 or 1.0 credit chemistry course at the 300 level will satisfy this requirement.

Two **minors** are available in the department of chemistry:

Chemistry Minor

The minor in chemistry requires 6 chemistry course credits.

Select one of the following:		1
CHEM 203	General Chemistry for Engineers	
CHEM 205	Principles of Chemistry	
CHEM 207	Explorations in Chemistry	
AP chemistry credit		
Five additional CHEM courses numbered 211 or higher. [1]		5

[1] A maximum of one course credit of undergraduate research (CHEM 375/CHEM 376) may be applied toward the minor.

Biochemistry Minor

The biochemistry minor requires **six** chemistry course credits.

Select one of the following:		**1**
CHEM 203	General Chemistry for Engineers	
CHEM 205	Principles of Chemistry	
CHEM 207	Explorations in Chemistry	
AP chemistry credit		
Required Courses		**2**
CHEM 351	Biochemistry I	
CHEM 352	Biochemistry II	
Electives		**3**
3 CHEM courses numbered 211 or higher [1]		

[1] A maximum of one course credit of undergraduate research (CHEM 375/CHEM 376) may be applied toward the minor.

Learning Goals for Undergraduate Chemistry Majors

To develop the knowledge and skills necessary for professional success after graduation, students will:

1. Achieve a fundamental proficiency in qualitative and quantitative aspects of chemistry. (1, 4, 6, 9)

2. Integrate and apply fundamental chemical knowledge to problems in advanced courses, including electives and/or undergraduate research. (1, 4, 6, 8, 9)

3. Skillfully perform a broad variety of laboratory procedures and critically evaluate data. (1, 4, 6)

4. Become proficient at searching and critically evaluating the chemical literature. (1, 4, 6, 8)

5. Effectively communicate scientific information both orally and in writing. (7)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

CHEM 105. Introduction to Chemistry. 1 Credit.
Offered Either Fall or Spring,TLC Tutoring Course; Lecture hours:3,Lab:3
A terminal elementary course covering in-depth selected topics, which may vary from year to year. Satisfies science requirement for Bachelor of Arts students not majoring in science or engineering. Not open to students who have taken CHEM 160 or any 200-level CHEM course. Prerequisite: seniors by permission only.

CHEM 107. Chemistry of Cooking. 1 Credit.
Offered Summer Session Only; Lecture hours:4,Other:3
This course will introduce students to the fundamental principles of chemistry in the context of cooking and food preparation. Students will analyze and solve food-related questions using chemistry concepts, create their own recipes by understanding the scientific interactions between ingredients and cooking methods and gain appreciation for the science behind cooking.

CHEM 131. What's That Smell?. 1 Credit.
Offered Occasionally; Lecture hours:3,Lab:3
Our sense of smell is an exquisite chemical detector that guides us to delicious foods, away from potential threats, and triggers memories of lived experiences. This course explores the many sources of smells in our environment, how we detect smelly chemicals, and how scents can be grouped using chemical thinking.

CHEM 203. General Chemistry for Engineers. 1 Credit.
Offered Fall Semester Only,TLC Tutoring Course; Lecture hours:3,Other:4
Fundamental principles in inorganic chemistry including aqueous reactions, atomic and molecular structure, coordination compounds, solids, liquids, and gases, and basic equilibrium. Laboratory experiments are both qualitative and quantitative.

CHEM 205. Principles of Chemistry. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3,Other:4
First college chemistry course for most students. Introduction to chemical principles. Prerequisite: high school chemistry or equivalent. Credit not given for both CHEM 205 and CHEM 207.

CHEM 207. Explorations in Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:3,Lab:5
Advanced introductory chemistry course for students with a strong chemistry background. Inquiry based projects and lab experiences. Students seeking permission to take CHEM 207 (instead of CHEM 205) must take the online placement test. Credit not given for both CHEM 207 and CHEM 205.

CHEM 211. Organic Chemistry I. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3,Other:4
First-year, second-semester course for students majoring in chemistry, biochemistry, and biology. Bonding and structure in organic compounds, resonance, organic acid/base reactions, basic nomenclature, conformational analysis, stereochemistry, properties and reactions of functional groups. Prerequisite: CHEM 203 or CHEM 205 or CHEM 207 or permission of instructor.

CHEM 212. Organic Chemistry II. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3,Other:4
A continuation of CHEM 211 with focus on properties and reactions of functional groups, synthesis, and spectroscopic analysis. Prerequisite: CHEM 211.

CHEM 230. Principles of Chemistry 2. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3,Other:4
Quantitative topics in equilibrium, acid-base chemistry, solubility, and electrochemistry, solid state crystal structures, coordination complexes, and nuclear chemistry are introduced. Especially appropriate for life-science students. Prerequisite: CHEM 203, or CHEM 205, or CHEM 207. Students may take only one of these for credit: CHEM 230, CHEM 231, or CHEM 233.

CHEM 231. Quantitative Analysis. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3,Other:5
Chemical equilibrium and modern analysis with an emphasis on acid-base systems, solubility, metal ion determinations, electroanalytical chemistry, spectrophotometry, and separation methods. Prerequisite: CHEM 203, or CHEM 205 or CHEM 207. Students may take only one of the following courses for credit: CHEM 230, CHEM 231 or CHEM 233.

CHEM 233. Analytical Chemistry for Engineers. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:4
Chemical equilibrium and modern analysis with an emphasis on acid-base systems, solubility, metal ion determinations, electroanalytical chemistry, and spectrophotometry. College of Engineering students only. Prerequisite: CHEM 205 or CHEM 207, or by instructor permission. Students may take only one of these for credit: CHEM 230, CHEM 231, or CHEM 233.

CHEM 2NT. Chemistry Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in chemistry. Prerequisite: permission of the instructor.

CHEM 313. Synthetic Organic Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:3,Recitation:1
Modern synthetic organic chemistry, with examples involving complex natural products. Application of organic mechanism, synthetic strategy, and advanced transformations to total synthesis. Prerequisite: CHEM 212. Crosslisted as CHEM 613.

CHEM 314. Mechanistic Organic Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4
Thermal and kinetic aspects of organic reactions are discussed along with the effect of substituents, solvents, and stereochemistry on reaction pathways. Qualitative molecular orbital theory of organic compounds is covered in depth. Weekly problem sessions are held. Prerequisite: CHEM 212. Crosslisted as CHEM 614.

CHEM 317. Special Topics in Organic Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4; Repeatable
Topics vary. Prerequisite: CHEM 212 or permission of the instructor. Crosslisted as CHEM 617.

CHEM 321. Inorganic Chemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:5
Structures and reactivity of inorganic systems. Emphasizes hands-on, experiential learning in workshops and laboratory. Prerequisites: CHEM 211 and CHEM 231 or permission of the instructor. Crosslisted as CHEM 621.

CHEM 322. Inorganic Chemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:5
Survey course in modern inorganic chemistry covering transition metal, coordination, organometallic, and bioinorganic chemistry. Laboratory will consist of synthetic and physical measurements as well as the manipulation of air sensitive materials. Prerequisite: CHEM 321 or permission of the instructor. Crosslisted as CHEM 622.

CHEM 327. Special Topics in Inorganic Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4; Repeatable
Topics vary. Prerequisite: CHEM 321 or permission of the instructor. Crosslisted as CHEM 627.

CHEM 332. Instrumental Analysis. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:5
Theory and practice of techniques of instrumental analysis including spectrophotometry, fluorescence, mass spectrometry, atomic absorption, chromatography, capillary electrophoresis and dynamic electrochemistry. Prerequisite: CHEM 231. Crosslisted as CHEM 632.

CHEM 337. Special Topics in Analytical Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4
Topics vary. Prerequisite: CHEM 231 or permission of the instructor. Crosslisted as CHEM 637.

CHEM 340. Biological Physical Chemistry. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:6
Introduction to physical chemistry for life science students, with emphasis on thermodynamics, hydrodynamics and spectroscopy. Not open to B.S. chemistry majors. Prerequisites: CHEM 231, MATH 201, and PHYS 211P. MATH 202 and PHYS 212 are recommended. Crosslisted as CHEM 640.

CHEM 341. Physical Chemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:5
Survey of physical chemistry including introductory thermodynamics, quantum mechanics, spectroscopy, kinetics, and statistical mechanics. Prerequisites: CHEM 231, MATH 211, and PHYS 212. Crosslisted as CHEM 641.

CHEM 342. Physical Chemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:5
Introductory physical chemistry with emphasis on quantum mechanics, structure and bonding, molecular spectroscopy and statistical mechanics. The customized laboratory experience will emphasize applications of spectroscopy and computational methods. Prerequisite: CHEM 341. Crosslisted as CHEM 642.

CHEM 343. Physical Chemistry for Engineers. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Introductory physical chemistry for engineers, with emphasis on thermodynamics, chemical kinetics and electrochemistry. Prerequisites: CHEM 231 or CHEM 233, MATH 211, PHYS 211. Only open to engineering majors.

CHEM 347. Special Topics in Physical Chemistry. 1 Credit.
Offered Occasionally; Lecture hours:4
Topics vary. Prerequisite: CHEM 230 or CHEM 231 or permission of the instructor. Crosslisted as CHEM 647.

CHEM 351. Biochemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Introduction to biological chemistry with emphasis on the structure and function of proteins, lipids, carbohydrates and nucleic acids, kinetics and mechanisms of enzymes, bioenergetics, and metabolism. Prerequisites: CHEM 212 and either CHEM 230 or CHEM 231. Crosslisted as CHEM 651.

CHEM 352. Biochemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Advanced topics in protein structure and function, protein folding, enzyme mechanisms, electron transport and free-energy coupling mechanisms, biosynthesis, metabolic regulation, and supramolecular assemblies. Prerequisite: CHEM 351 or permission of the instructor. Crosslisted as CHEM 652.

CHEM 357. Special Topics In Biochemistry. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:1
Structure/function relationships and dynamics of biomolecules. Prerequisite: permission of the instructor. Crosslisted as CHEM 657.

CHEM 358. Biochemical Methods. 1 Credit.
Offered Spring Semester Only; Lecture hours:2,Other:6
A course in laboratory techniques including cell fractionation, protein, and nucleic acid analysis. Spectrophotometry, chromatography, centrifugation, electrophoresis, and mass spectrometry are emphasized. Prerequisites: BIOL 203 and BIOL 204 and CHEM 351 and permission of the instructor. Crosslisted as BIOL 340.

CHEM 360. Advanced Environmental Chemistry. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:4
Chemistry of the atmosphere, hydrosphere, and lithosphere. Natural processes and anthropogenic effects will be discussed. Prerequisite: CHEM 230 or CHEM 231 or permission of the instructor. Crosslisted as CHEM 660.

CHEM 365. Atmospheric Chemistry and Physics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Addresses the relationships of chemistry, physics, and engineering principles in understanding processes in the Earth's atmosphere. Topics include overview of the Earth's atmospheric history and problems of current environmental concerns including urban ozone, acid rain, particulate pollution, and global change. Crosslisted as CHEG 455 and CHEG 655.

CHEM 375. Undergraduate Research. .5-2 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Original investigations in analytical, biological, organic, physical, environmental or inorganic chemistry.

CHEM 376. Undergraduate Research. .5-2 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Original investigations in analytical, biological, organic, physical, environmental or inorganic chemistry.

CHEM 385. Seminar. .5 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Topics vary. Crosslisted as CHEM 685.

CHEM 386. Seminar. .5 Credits.
Offered Spring Semester Only; Lecture hours:2; Repeatable
Topics vary. Crosslisted as CHEM 686.

Children's Studies Minor

Faculty

Co-coordinators: Chris J. Boyatzis, Lori A. Dira

The interdepartmental children's studies minor offers a multidisciplinary perspective on children and childhood to help students achieve a deeper and broader understanding of children and childhood. Children are examined in contexts of culture, historical era, educational systems, socioeconomic class, geographic setting, religious ideology, political and economic systems, and so on. In addition, children's studies is concerned with children's "lived" experience. Thus, some courses may examine exigencies that affect hundreds of millions of children globally (e.g., poverty, hunger, war, disease, labor, etc.). Children's studies also emphasizes advocacy and service for children. Thus, many courses in the minor involve a service-learning or fieldwork component in which students work directly with children (e.g., in a hospital, community center, counseling clinic, school). These opportunities enrich students' understanding of children, enhance students' growth as involved citizens, and benefit children and organizations in the community.

The children's studies minor could benefit students from many departments. Many education and psychology students could be interested, and there are other audiences and specialized interests: pre-med students interested in pediatrics, English majors interested in children's literature, pre-law students interested in family law or child advocacy, computer science or engineering students interested in educational or recreational software, and so on. Collectively, the courses in the minor will expose students to new undergraduate opportunities as well as varied educational and career options.

The minor consists of five courses from the list below with the following stipulations. At least four courses must be at the 200 level or above, and no more than two courses taken in any one department may count toward the minor. Per University policy, students may not double-count courses for

a major and a minor. (For example, an education major may not count EDUC 102 Educational Psychology for this minor because it is required for the education major, but the student may use PSYC 307 Culture and Child Development to count for the minor.) One of the five courses may be a one-credit independent study completed in any department that has an appropriate focus and content to count for the minor. Before starting such an independent study, it must be approved by the coordinators if the student wishes it to count toward the minor.

EDUC 102	Educational Psychology	1
EDUC 227	Immigrant Youth in U.S. Society	1
EDUC 230	Foundations of Classroom Assessment	1
EDUC 235	The Creative Process	1
EDUC/WMST 290	Gender Issues in Education	1
EDUC 318	Critical Multiculturalism	1
EDUC 321	Disability Studies	1
EDUC 323	Education of Young Children	1
EDUC 335	Child & Adolescent Development	1
EDUC/PSYC 338	Bucknell in Italy: Childhood, Family & Education in Italy	1
EDUC 347	Family, School, and Community Partnerships	1
ENLS 220	Young Adult Fiction	1
ENLS 290	Special Topics	1
FREN 370	Topics in Civilization (Learning to be French: Education and Identity in Modern and Contemporary France)	1
MATH 203	Introduction to Mathematical Thought	1
MATH 204	Elementary Geometry and Statistics	1
MUSC 135	Introduction to Teaching Music	1
MUSC 230	Music for Exceptional Children	1
PSYC 307	Culture and Child Development	1
PSYC 320	Children's Studies	1

Chinese Language

Faculty

Professor: Elizabeth L. Armstrong (Teaching)

Associate Professors: Song Chen, Erik R. Lofgren (Chair), James J. Orr, Xi Tian

Assistant Professor: Yunjing Xu

Visiting Assistant Professor: Yuka Kaneko Hughes

See East Asian Studies (p. 94).

Classics & Ancient Mediterranean Studies

Faculty

Professors: Kevin F. Daly, Stephanie Larson

Associate Professors: Ashli Baker, Kristine Trego (Chair)

Assistant Professor: Katie Tardio

The curriculum of the Department of Classics & Ancient Mediterranean Studies provides students multidisciplinary opportunities to study the Mediterranean world of the ancient Greeks and Romans, and to a more limited extent, the ancient societies of the Near East and Egypt. Some courses also stress the classical tradition and the inheritance of Greco-Roman ideas and art forms. The department offers varied kinds of courses through which students may approach the study of the ancient world, including courses in Greek and Latin.

The classics & ancient Mediterranean studies curriculum rests on an expansive interdisciplinary approach to classical studies and therefore prepares students well for a wide range of careers. Broad liberal arts education and training in critical thinking, language analysis, oral presentation and writing give our students the tools necessary to succeed in such varied careers as law, teaching, journalism and management, and to adapt well to the rapid pace of change that is characteristic of contemporary life.

To facilitate students' exploration of the diversity and complexity of the ancient world and the contemporary disciplines that study it, the department groups its courses into five categories:

1. Ancient History & Society
2. Archaeology & Material Culture
3. Myth & Text
4. Greek
5. Latin

Ancient History & Society

Courses in this category focus on the study of the cultures and societies of ancient Greece, Rome and the Near East, including religion, politics, law, sexuality, economics, education, patterns of thought and behavior, as well as the approaches and methodologies of ancient historians.

CLAS 131	Greek Civilization	1
CLAS 132	Roman Civilization	1
CLAS 217	Greek History	1
CLAS 218	Roman History	1
CLAS 220	Preindustrial Environment	1
CLAS 229	Ancient Biography	1
CLAS 233	The Age of Alexander the Great	1
CLAS 236	The Age of Augustus	1
CLAS 252	New Testament and Christian Origins	1
CLAS 332	Classical Athens	1
CLAS 333	After Alexander: Hellenistic Cultural Landscape	1
CLAS 334	Women in Antiquity	1
CLAS 337	Use and Abuse of the Past: Adaptation and Revision	1

Archaeology & Material Culture

Courses in this category focus on the study of physical evidence, including the processes by which material objects from the ancient world are uncovered and analyzed; evolution of urban forms; expressions of architecture and art; theories and practices of ancient technology; and the relationships that ancient cultures had with their environments and ecosystems.

CLAS 141	Ancient Cities	1
CLAS 241	Archaeology of Egypt	1
CLAS 242	Archaeology of Greece	1
CLAS 243	Archaeology of Rome	1
CLAS 247	Ancient Technology	1
CLAS 253	Ancient Ships and Seafaring	1
CLAS 262	Life in Ancient Pompeii	1

Myth, Text & the History of Language

Courses in this category focus on the study of the traditions of ancient mythology, the major Greek and Roman literary works and authors in translation, and the ways in which images and ideas from ancient myths and texts took shape in later literary traditions. Students interested in these topics also may want to consider the language and literature courses in Greek and Latin (see below).

CLAS 120	The Secret History of Words: The Greek and Latin Origins of English and Bio-Scientific Vocabulary	1
CLAS 215	Classical Myth	1
CLAS 221	Heroic Epic	1
CLAS 222	Greek Tragedy	1
CLAS 225	The Classical Tradition	1
CLAS 331	War and the Iliad	1
CLAS 336	The Ancient Novel	1

Classical Languages: Greek

Our courses in classical languages are grouped into Greek and Latin and involve the study of the language and reading of primary authors. Although Latin and ancient Greek are no longer spoken, we encourage students to study these languages knowing that working with them encourages logical thought; a sophisticated grasp of the possibilities of language, including English; skills in close reading and literary analysis; a deeper and more complete understanding of these ancient cultures; and opportunities to study firsthand many foundational works of human production.

Beginning, intermediate and advanced sequences GREK 101, GREK 102, GREK 200, GREK 300 and GREK 301 are offered each year. Students with previous Greek experience should consult a member of the department when choosing where to start in the sequence. The sequence begins with GREK 101 in the fall semester.

GREK 101	Introductory Ancient Greek	1
GREK 102	Introductory Ancient Greek	1
GREK 200	Intermediate Greek	1
GREK 300	Studies in Greek Literary Prose	1
GREK 301	Studies in Greek Literary Poetry	1

Classical Languages: Latin

Our courses in classical languages are grouped into Greek and Latin and involve the study of the language and reading of primary authors. Although Latin and ancient Greek are no longer spoken, we encourage students to study these languages knowing such study encourages logical thought; a sophisticated grasp of the possibilities of language, including English; skills in close reading and literary analysis; a deeper and more complete understanding of these ancient cultures; and opportunities to study firsthand many foundational works of human production.

Beginning, intermediate and advanced sequences LATN 101, LATN 102, LATN 200, LATN 300 and LATN 301 are offered each year. Students with two or fewer years of secondary school Latin should enroll in LATN 101 or LATN 102; consultation with a member of the department is advised.

LATN 101	Introductory Latin	1
LATN 102	Introductory Latin	1
LATN 200	Intermediate Latin [1]	1
LATN 300	Studies in Latin Literary Prose	1
LATN 301	Studies in Latin Literary Poetry	1

[1] Intended for students with at least two semesters of college Latin or three or more years of secondary school Latin.

Major in Classics & Ancient Mediterranean Studies

The department recommends that a student choosing a major or minor in classics develop a focus in one of the categories within the department, as described in the Overview. Students who are interested in pursuing graduate studies in classics are strongly recommended to include several years of concentrated language study of both Greek and Latin in their curriculum.

A **major** in classics & ancient Mediterranean studies consists of a minimum of eight courses, with the following requirements:

At least two courses in Greek or Latin
At least two courses in classics & ancient Mediterranean studies [1]
Culminating Experience
Select one of the following: (during or after the second semester of junior year)
One 300-level classics & ancient Mediterranean studies seminar
A credit-bearing classics experience outside Bucknell [2]
Writing an honors thesis (a one-year sequence reserved for GPA of 3.5 or higher)

[1] Additional courses that relate to classics offered by other departments may be applied to the major in classics with the adviser's approval. No more than two such courses at the 100 level may count toward the major.

[2] Such as: archaeological field experience in Greece, Italy or other ancient sites in the Mediterranean area. This option must be cleared by both the student's academic adviser and the chair of the Classics & Ancient Mediterranean Studies department to count for the Culminating Experience.

In these and other experiences within the classics & ancient Mediterranean studies major, professors will also emphasize the following main areas of competence: written and oral communication skills and information literacy.

Students are encouraged to choose an honors program in classics, Greek or Latin. Candidates for honors must take CLAS 321 Honors Tutorial and Thesis-CLAS 322 and pass with distinction the oral examination on the thesis.

The department strongly encourages its majors to study abroad in a Mediterranean setting, in Italy or Greece especially. Several options for a semester, a year or a summer are available, including a classics-based Bucknell study abroad semester in Athens, Greece, offered every spring.

Minors in Classics & Ancient Mediterranean Studies

Three **minors** are offered by the department of classics & ancient Mediterranean studies.

Greek Minor

The Greek minor consists of four full-credit courses in Greek at any level taken at Bucknell.

Latin Minor

The Latin minor consists of four full-credit courses in Latin at any level taken at Bucknell.

Classics & Ancient Mediterranean Studies Minor

The minor in classics & ancient Mediterranean studies consists of five courses in classics (CLAS), including no more than two courses in Greek and/or Latin. The minor in classics may include up to two courses offered by other departments or programs chosen from a list that is periodically updated. This list includes:

PHIL 205	Greek Philosophy	1
RESC 098	Foundation Seminar in Residential Colleges (Myth, Reason, & Faith)	1

Learning Goal: Competence/proficiency in language.

- Students in introductory Greek and Latin language courses will demonstrate competence in language by being able to a) analyze grammatical structure and b) read (translate) and understand appropriate Latin and Greek passages.
- Majors in advanced language courses will demonstrate proficiency by being able to a) do all of the above including being able to generate a translation of a selection of a work read that accurately reflects the structure of the original language while at the same time demonstrating the ambiguity the language possesses and b) be able to recognize and to comment meaningfully on aspects of style, word choice, overall structure, basic textual problems, context and current scholarly approaches to the work

Learning Goal: Knowledge of historical/cultural contexts in the ancient world.

- Classics majors will be able to comment meaningfully on major ancient historical events and cultural developments, setting them within the context of Greek and Roman history.
- Classics majors demonstrate an ability to recognize the ways in which the interpretation of texts and artifacts is influenced by literary, philosophical, social, and cultural developments.

Learning Goal: Research and presentation methods and skills.

- Students graduating with a major in classics will demonstrate facility with discipline-specific research and presentation methods.

Classics Courses

CLAS 120. The Secret History of Words: The Greek and Latin Origins of English and Bio-Scientific Vocabulary. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the Greek and Latin origins of many English words and the specialized vocabulary in fields such as the biosciences and law. We will primarily analyze words in order to improve your comprehension of English, but will simultaneously learn about the languages and cultures of the ancient Mediterranean.

CLAS 131. Greek Civilization. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to the study of ancient Greek civilization through its art, literature, history, religion, etc. Emphasis on the classical period.

CLAS 132. Roman Civilization. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to Roman Civilization from Romulus to Constantine. Emphasis on social and cultural history, including literature, art, architecture, religion, and historiography in their cultural context.

CLAS 141. Ancient Cities. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Introduction to Near Eastern and Greco-Roman civilization through study of major urban centers. Seniors by permission of the instructor.

CLAS 150. Modern Greek Language. 1 Credit.
Offered Occasionally; Lecture hours:3
Introduction to the basics of the Modern Greek language and culture; taught on site in Athens during the semester study abroad program in Athens.

CLAS 215. Classical Myth. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of the traditional tales of Greece and, to a lesser extent, the Near East and Rome; consideration and application of myth theory. Seniors by permission of the instructor.

CLAS 216. Athenian and Theban Traditions. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
Theban and Athenian myth traditions studied in their historical context and as cultural constructions expressing identity, religion, and regional opposition through literature, vase painting, and architecture.

CLAS 217. Greek History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Greek history from the heroic Bronze age down through the Persian invasion, the flourishing of Classical Athens, and the Peloponnesian wars to the death of Socrates, focusing on political, social, and economic developments. Crosslisted as HIST 240.

CLAS 218. Roman History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Roman history from Rome's foundations as a backwater village ca. 753 BCE, through its rise as a world-power to its fall in the fourth century CE, focusing on economic and political issues. Crosslisted as HIST 241.

CLAS 220. Preindustrial Environment. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An introduction to global environmental history of the preindustrial world through three thematic lenses: how the natural environment shaped patterns of human life, how ideologies toward nature shifted over time, and how human activities and ideologies reshaped the ancient landscape. Crosslisted as ENST 216.

CLAS 221. Heroic Epic. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Interpretive study of Homer's Iliad and Odyssey and other epics chosen by the instructor (e.g., the Argonautica and Aeneid). Study may include epic works of later traditions.

CLAS 222. Greek Tragedy. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Interpretive study of the works of Aeschylus, Sophocles, and Euripides.

CLAS 225. The Classical Tradition. 1 Credit.
Offered Occasionally; Lecture hours:3
This course will investigate (ab)uses of ancient Greco-Roman material in various modern cultures, such as 19th-20th century Germany and modern China. We will consider the power of Greco-Roman Classics in global and Asian contexts and how to prevent abuses of that power.

CLAS 226. Ancient Conflict and Competition. 1 Credit.
Offered Occasionally; Lecture hours:3
The ancients had numerous settings for conflict and competition: battlefields, stadia, and artistic patronage. This course explores the origin, content, and meaning of agonistic display.

CLAS 229. Ancient Biography. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the emergence and development of ancient biographical writing.

CLAS 230. Herodotus and His World. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
Study of the historian's work alongside major cultural moments of the 5th century BCE, including the Persian and Peloponnesian wars, the Sophistic movement, the Athenian Empire, and the Aegean Sea as a cultural conduit.

CLAS 233. The Age of Alexander the Great. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Study of the transformation of classical Greek culture into a civilization dominating the Mediterranean world and its Eastern neighbors. Topics may include art, urban culture, politics, intellectual expressions, and religious innovation.

CLAS 235. Dying for God: Martyrdom from Antigone to ISIS. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Early Christians were attracted to dramatic narratives of suffering--whether about spectacular deaths in the arena or extreme self-denial in the desert. This course explores the world of martyrs and monks and considers how ancient ideals about pain, gender, and sexuality continue to influence Christian thinking about holiness and sainthood. Crosslisted as RELI 253 and WMST 245.

CLAS 236. The Age of Augustus. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Study of late republican - early empire Rome, emphasizing the transition from the republic to empire, the role played by Augustus in this transition, the tension between East and West, and the crisis of morals.

CLAS 240. Roman and Byzantine Greece. 1 Credit.
Offered Occasionally; Lecture hours:4
History and archaeology of Roman and Byzantine Greece; focus on culture through art, architecture, religion, politics, and regional studies. Taught on site and in Athens during the semester study abroad program in Athens.

CLAS 241. Archaeology of Egypt. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Survey of the material culture, with emphasis on major architectural and artistic developments and their legacy to modern Western civilization. Crosslisted as ARTH 241.

CLAS 242. Archaeology of Greece. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of the material culture of the Greek world from the Bronze Age through the Hellenistic period. Crosslisted as ARTH 242.

CLAS 243. Archaeology of Rome. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Survey of the material culture of the Roman world from the Etruscans through the late Empire. Crosslisted as ARTH 243.

CLAS 244. Magic and Mystery of the Ancient Mediterranean World. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines the literary and material culture of ancient Greece and Rome to understand their mystical and magical practices, from civic rituals to personal spells and curse tablets. Through study of these practices we will gain a unique perspective on ancient social culture.

CLAS 247. Ancient Technology. 1 Credit.
Offered Alternate Fall and Spring; Lecture hours:3
A detailed survey of the state of ancient technology by the time of the early Roman empire in its economic and social context. Topics include sources of power, mining and metallurgy, quarrying, land and sea transport, and the urban infrastructure.

CLAS 250. Topic in Classics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of a topic relating to the classical world and its tradition. Examples, slavery, women, religions, a historical period. May be repeated for credit when topic varies.

CLAS 252. New Testament and Christian Origins. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of the earliest Christians through the writings that later became the New Testament. We will examine these sources in the context of their specific social and historical concerns and consider the complex process in which some writings were included in Christian scripture while others were rejected. Crosslisted as RELI 252.

CLAS 253. Ancient Ships and Seafaring. 1 Credit.
Offered Occasionally; Lecture hours:3
This course will introduce you to the ships, sailors, and navies of the ancient Mediterranean and of Greece and Rome in particular. We will analyze the evidence in ancient texts, shipwreck archaeology, and artistic representations.

CLAS 255. Archaeology of Food. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines a range of archaeological methods and materials used to study diet, the economics of food, the politics of food distribution and consumption, feasting and religion, and the social significance of food in questions of gender, ethnicity and status in and around the ancient Mediterranean.

CLAS 262. Life in Ancient Pompeii. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the history, literature and material culture of Pompeii with the goal of better understanding daily life for all levels of society in the early Roman Empire. Crosslisted as ARTH 262.

CLAS 311. Independent Study in Classics. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Topics in classical civilization, to be chosen by the student. Prerequisite: permission of the instructor.

CLAS 321. Honors Tutorial and Thesis. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies
Independent study and research leading to the writing of a thesis. Prerequisite: permission of the instructor.

CLAS 322. Honors Tutorial and Thesis. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies
Independent study and research leading to the writing of a thesis. Prerequisite: permission of the instructor.

CLAS 331. War and the Iliad. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the Iliad and its influence at great depth. Students will read the entire Iliad (in English) as well as related texts from Greece and Rome. Homer's depiction of war and its consequences will be compared to modern and ancient descriptions of warfare. Prerequisite: permission of instructor.

CLAS 332. Classical Athens. 1 Credit.
Offered Occasionally; Lecture hours:3
An in-depth integrative study of Athens from the 6th - 4th centuries including its literature, arts, architecture, religion, philosophy, politics. Some background required.

CLAS 333. After Alexander: Hellenistic Cultural Landscape. 1 Credit.
Offered Occasionally; Lecture hours:3
An interdisciplinary examination of the Hellenistic cultural landscape as a cultural, historic, ecological, and symbolic system. Includes discussion of the eastern Mediterranean and central Asia as a focus of confrontation between east and west over time. Prerequisite: permission of the instructor.

CLAS 334. Women in Antiquity. 1 Credit.
Offered Occasionally; Lecture hours:3
Seminar-style examination of the lives of women in antiquity both real and imagined, as attested in a variety of ancient media. Prerequisite: permission of the instructor. Crosslisted as WMST 334.

CLAS 336. The Ancient Novel. 1 Credit.
Offered Occasionally; Lecture hours:3
Study of Graeco-Roman prose fiction, such as Apuleius' "Golden Ass', and Longus' 'Daphnis and Chloe', together with current scholarly literature. Prerequisite: permission of the instructor.

CLAS 337. Use and Abuse of the Past: Adaptation and Revision. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines the positive and negative ways that Greco-Roman history and culture are continually evoked in modern discourses by those who attempt to shape society, our concepts of culture, and our relationships with one another. Prerequisite: permission of the instructor.

CLAS 338. Women in Ancient Rome. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This class will focus on the lived experience of women in ancient Rome, including women from Roman provinces, from the founding of the city through the early Empire—a period of about 900 years. Using literary, visual and archaeological evidence, we will examine issues of agency, participation and exclusion. Crosslisted as WMST 338.

CLAS 350. Seminar on a Classical Topic. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of a topic of importance in classics. Examples: a current problem, an important figure, a historical period. Prerequisite: permission of the instructor.

Greek Courses

GREK 101. Introductory Ancient Greek. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
An introduction to the classical and koine forms of the language. Emphasis upon forms and grammar, and rapid development of facility in reading.

GREK 102. Introductory Ancient Greek. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
An introduction to the classical and koine forms of the language. Emphasis upon forms and grammar, and rapid development of facility in reading. Selections chosen from a range of Greek periods. Prerequisite: GREK 101 or equivalent.

GREK 200. Intermediate Greek. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Study of selected works in Greek, including such authors as Homer, Euripides, Herodotus, Lysias, Plato, Xenophon. Review of forms and grammar. Prerequisite: GREK 102 or equivalent.

GREK 300. Studies in Greek Literary Prose. 1 Credit.
Offered Fall Semester Only; Lecture hours:3; Repeatable
Study of a topic or author focusing on original Greek texts in prose (e.g., Herodotus, Demosthenes, Thucydides, Plato, New Testament). Highly recommended for students anticipating application to graduate programs in classics or divinity. Prerequisite: GREK 151 or GREK 200 or equivalent.

GREK 301. Studies in Greek Literary Poetry. 1 Credit.
Offered Spring Semester Only; Lecture hours:3; Repeatable
Study of a topic or author focusing on original Greek texts in poetry (e.g., Homer, Sophocles, Apollonius of Rhodes). Highly recommended for students anticipating application to graduate programs in classics or divinity. Prerequisite: GREK 200 or equivalent or permission of the instructor.

GREK 311. Independent Study in Greek. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Independent study of Greek texts with concomitant study of secondary sources. Prerequisite: permission of the instructor.

Latin Courses

LATN 101. Introductory Latin. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Introduction to the language. Emphasis upon forms and grammar, and rapid development of facility in reading.

LATN 102. Introductory Latin. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
Continuing study of Latin grammar with review of basic material, including the introduction to Latin reading. Prerequisite: LATN 101 or equivalent.

LATN 200. Intermediate Latin. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Review of the grammar necessary for the introductory reading of selected Roman authors. Authors may include Plautus, Cicero, Catullus, and Vergil. Prerequisite: LATN 102 or equivalent.

LATN 300. Studies in Latin Literary Prose. 1 Credit.
Offered Fall Semester Only; Lecture hours:3; Repeatable
Study of a topic or author focusing on original Latin texts in prose (e.g., Caesar, Tacitus, Livy). Highly recommended for students anticipating application to graduate programs in classics or divinity. Prerequisite: LATN 151 or LATN 200 or equivalent.

LATN 301. Studies in Latin Literary Poetry. 1 Credit.
Offered Spring Semester Only; Lecture hours:3; Repeatable
Study of a topic or author focusing on original Latin texts in poetry (e.g., Virgil, Horace, Ovid, Martial). Highly recommended for students anticipating application to graduate programs in classics or divinity. Prerequisite: LATN 200 or equivalent or permission of the instructor.

LATN 311. Independent Study in Latin. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Independent study of Roman authors, with concomitant study of secondary sources. Prerequisite: permission of the instructor.

Community Engaged Leadership Minor

Faculty

Coordinator: Katherine M. Faull

The community engaged leadership minor offers students the opportunity to benefit from Bucknell's liberal arts environment, as well as a strong culture of community, civic engagement and leadership programs, both curricular and co-curricular. This program will encourage students to engage in coursework and other experiences that cultivate community engagement competencies, both knowledge and skills, and recognize the students who do so, enhancing their prospects for graduate study and employment. In the context of this minor, leadership is defined as collaborative, consensus-based and empathy-based team building for social change.

Completion of the program will enrich students' understanding of their respective majors and other minors and prove useful to careers or graduate studies in a variety of fields including: public policy, advocacy, media, social and cultural analysis, and careers in both domestic and international organizations. Students who satisfy the requirements will have "Community Engaged Leadership Minor" added to their transcript.

The community engaged leadership minor will integrate diverse programs to introduce all students to campus-wide, engaged leadership opportunities, and a diverse array of existing academic minors and engaged scholarship courses.

Courses and Expectations:

The requirements are 3 credits plus the equivalent of 2 courses of community engagement as follows:

1. Foundational courses (0.5 credits each, UNIV 190 Community Engaged Leadership and UNIV 191 Community Engaged Practice). This interdisciplinary approach to community-engaged leadership will be taught in a mode similar to IP courses in which multiple guest lecturers will introduce students to a broad array of engaged leadership possibilities. Students will have the opportunity to survey engaged leadership theory to identify that which aligns most closely to their personal vision and mission statements. Introductory topics include developing a sense of self-awareness, completing a personal inventory to include: implicit bias, active listening skills, constructive communication, public speaking, ethics, negotiating conflict, power and privilege, and time management. Students will also be introduced to the layered challenges that poverty presents to various communities, as well as benchmarks used to track progress that include the Social Determinants of Health model and the UN Sustainable Development goals.

2. Two further courses beyond the core that must be taken in two different colleges or be taught in a cross-disciplinary manner, i.e. UNIV courses. A list of approved courses is available from the community engaged leadership minor adviser. No more than one of these courses may be 100 level and should focus on two or more of the following areas:
   Diversity Equity & Inclusion
   Professional or Social Ethics
   Organizational Principles and Practices
   Confounding Problems
3. Students must complete at least 260 hours of co-curricular and/or experiential programs (this is the Carnegie Foundation for the Advancement of Teaching's standard equivalent to 2 course credits for community engagement).
4. Submission and presentation to the Community Engaged Leadership Minor Coordinating Committee of a reflective Impact Statement by the beginning of the final semester of the student's graduation year for formal approval. This reflection is the product of regular meetings with the minor adviser and sustained reflection on curricular and co-curricular activities, as recorded in the Pathways platform.

Learning Goals -- civic knowledge, skills, disposition, engaged practice experience

Students or faculty instructors can request that relevant courses be included in the program by obtaining approval from the Coordinating Committee of the program. Students may be able to count an internship or fieldwork related to community-engaged leadership in the form of an independent study course, if approved by the Community Engaged Leadership Minor Coordinating Committee. Students may request that global education courses be considered for the program; the Coordinating Committee will consider such courses upon review of the syllabus consultation with a member of the global education department.

Administration of Program: The Community Engaged Leadership Minor Coordinating Committee will consist of:

1. The director of the Center for Community Engaged Leadership, Learning & Research or their designate
2. The associate director of Community Based & Engaged Learning
3. The faculty director for Academic Community Engaged Learning
4. Two members of the Engaged Bucknell Coordinating Council, one staff person from the Division of Student Affairs and one faculty member
5. One additional instructor who teaches Community-Engaged Learning designated course(s)
6. One student representative and one community partner representative

Comparative & Digital Humanities

Faculty

Professors: Katherine M. Faull, John C. Hunter, James Mark Shields (Director)

Assistant Professor: Daniel Bret Leraul

Lecturer: Diane Jakacki

The comparative & digital humanities program approaches global traditions of ideas, history, literature, music and art in an interdisciplinary fashion. Designed to reflect contemporary trends in humanistic scholarship, it teaches students how to compare, analyze and integrate materials from different cultures, media and/or historical periods; these are vital skills for the 21st century world that conventional undergraduate disciplinary boundaries often exclude. These include the various ways in which, for example, digital technology has changed our relations to knowledge; how the categories “Asia” and the “West” have been constructed and represented; how translation works in a globalized world; how science and the humanities interact; and the historical and cultural shifts in the way knowledge has been classified. Our courses, taught by faculty from comparative & digital humanities and other humanities departments, are designed to help students develop a set of intellectual tools that can be applied in any professional or academic context. Classes are limited in size so students can share through discussion their reactions to the works studied, relate them to their own lives and attempt to judge their relevance to the contemporary “globalized” world. Inasmuch as language and culture are central to this interdisciplinary project, students who declare a major in the comparative humanities are required to satisfy a language requirement.

The major is especially suitable for students interested in broad study of the humanities and comparative studies, e.g., individuals otherwise focusing their education on the sciences and other non-humanities disciplines, or students interested in advanced study of the humanities in graduate programs and seeking a balance of disciplinary and interdisciplinary studies for this purpose.

Students interested in the major are encouraged to contact the program director listed above as soon as possible to begin the advising process.

Comparative & Digital Humanities Major

The **major** consists of eight courses (including a senior thesis) and a demonstration of reading proficiency in a foreign language. The courses include:

HUMN 100	The Humanities Now! [1]	1
Two of the following three period courses: [2]		2
HUMN 128	Myth, Reason, Faith	

HUMN 150	Making Modern Worlds	
HUMN 250	Modernisms and Crises	
Two 200-level courses in Comparative & Digital Humanities (HUMN) [3]		2
Two 300-level seminar courses in Comparative & Digital Humanities (HUMN) [4]		2
HUMN 350	Senior Thesis Workshop [5]	1
or HUMN 351	Honors Tutorial and Senior Thesis	
Foreign language requirement [6]		

1 An introduction to the methodologies of comparative and digital humanistic inquiry.

2 These courses ground students in the broad outlines of world intellectual traditions. All three courses teach analytical writing and information literacy skills through mandatory research assignments in close consultation with the instructor and library staff.

3 These courses allow students to build on knowledge gained in the introductory courses in a variety of fields in the humanities.

4 These seminars allow in-depth analysis of a range of subjects and comparative methods.

5 The senior thesis gives students a chance to pursue focused research on a subject of particular interest to them. Discussion of the thesis topic must begin in the spring of the student's junior year and the topic must have attained final approval by the faculty adviser by the end of September of the senior year. The thesis project may be submitted to the Honors Council for consideration as an honors thesis but this is not required to complete the major. Successful completion of the thesis requirement (including an oral defense) counts as the Culminating Experience in comparative & digital humanities.

6 In keeping with the program's goal of exposing students to different modes of thought, the program asks students to demonstrate work in a foreign language in addition to the eight courses required for the major. Such competency can be attained by passing a one-credit course at the level of the fourth course or higher in a particular language sequence. Students are encouraged to develop language competency elsewhere, as in summer school or abroad; however, all such programs must first be approved by the comparative humanities program director. Students whose native language is not English or who are bilingual are exempt from the language requirement.

Minor in Comparative Humanities

A **minor** in comparative humanities consists of five courses. These must include:

Two of the following three period courses:		2
HUMN 128	Myth, Reason, Faith	
HUMN 150	Making Modern Worlds	
HUMN 250	Modernisms and Crises	
Three additional Comparative Humanities (HUMN) courses, at least one of which must be a 300-level seminar.		3

Minor in Digital Humanities

A **minor** in digital humanities consists of five courses. These must include:

Two of the following:		**2**
HUMN 100	The Humanities Now! [1]	
HUMN 270	Data Visualization for the Digital Humanities	
HIST 201	Introduction to Historical GIS	
HUMN 319	Independent Study [2]	1
Two elective courses with the permission of the Digital Humanities Minor Coordinator		**2**

1 Topics for HUMN 100 include Digging into the Digital, The Humanities Now!, Intro to Text Analysis and Techno-Culture-World.

2 Students may elect to complete HUMN 319 Independent Study (or an equivalent approved independent study in another department) as a full-credit independent study or as two .5 credit independent studies.

Students must also complete a final DH portfolio that demonstrates a student's creation of artifacts in courses already taken and (if appropriate) DH work components of a thesis (departmental/honors). The student will create a website (WordPress) that consists of digital artifacts and a narrative that analyzes how these pieces fit together (a digital manifesto). Students may receive feedback from the DH minor coordinator before the formal submission of the digital portfolio. This final portfolio will be submitted for formal approval.

College of Arts & Sciences
Department and Program Learning Objectives

Majors in Comparative & Digital Humanities will be able to:

Compare and evaluate cultural differences in a non-hierarchical manner across boundaries of all kinds:

Historical (including situations, intellectual products and material remains of different periods);
Cultural (including race, gender, nationality, religion and sexual orientation); and
Formal (between different modes of thought and expression). (2, 3, 5, 6)

Critically compare intellectual materials of different or opposing types: textual with material artifacts; narrative with non-narrative texts; artistic with analytical modes of thought; analog and digital. (6, 8)

Understand the cultural, social, ethical and theoretical debates within the digital humanities. (2, 5, 9)

Demonstrate artful and effective oral and analytical skills, in analog and digital form. (7, 8)

Demonstrate proficiency in a second language. (3)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

HUMN 100. The Humanities Now!. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A multi-section course in the humanities that introduces students to the humanities world through use of latest tools and methods of analysis. Open to first-years and sophomores only.

HUMN 128. Myth, Reason, Faith. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
An introduction to the most significant works (literature, poetry, theatre, philosophy, religious texts) in the Western and Asian intellectual traditions, extending from ancient Mesopotamia and Greece through late medieval Europe and/or East Asia. Not open to students who have completed RESC 098 "Myth, Reason, Faith". Seniors by permission only.

HUMN 150. Making Modern Worlds. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An interdisciplinary study of art, music, literature, science and philosophy from the European Renaissance through the late 19th century. The student will learn to relate these works to one another, to non-Western cultures, and to contemporary experience. Not open to students who have taken ENLS 150.

HUMN 230. Arts of Extraction: Hemispheric Representations of Ecological Injustice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explore the social and environmental histories of capitalism in Latin America and the US through literary, filmic and photographic representations of resource extraction. Environmental collapse is imminent, but many can't see it. Can the arts help us see our world differently so that we might forestall its worst effects? Crosslisted as LAMS 230.

HUMN 241. Germans and the World: Colonization, Emigration, Exile. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Focuses on recorded experiences of German-language writers, poets, playwrights and filmmakers outside geographical boundaries of German states from 18th-21st C. Introduces concepts of cross-cultural exchange, linguistic assimilation, artistic synthesis and critical analysis of the writer's new cultural and linguistic context and the critical lens that is turned back on Germany. Crosslisted as GRMN 241.

HUMN 250. Modernisms and Crises. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Traces the development of "modernity" (and its discontents) by looking at selected interdisciplinary texts and documents - from philosophy, literature, psychology, film, art, and other related disciplinary fields - that reflect or directly address cultural transformation during the 20th century.

HUMN 260. Introduction to Translation Studies. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
An introduction to the history, theories, and development of the field of Translation Studies. Facility in one language other than English is strongly recommended. Crosslisted as EAST 205.

HUMN 266. Chinese Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to Chinese thought, including: the major schools and thinkers of the classical age, Chinese Buddhist philosophy, early modern Neo-confucianism, and Chinese philosophy since the Communist Revolution of 1949. Crosslisted as EAST 266 and PHIL 266.

HUMN 270. Data Visualization for the Digital Humanities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to the techniques and issues of data visualization for the humanities. Interdisciplinary and comparative study, using both theoretical study and concrete examples. Not open to students who have taken ANOP 270.

HUMN 272. Interdisciplinary Studies in the Humanities. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Comparative study investigating different cultures, historical epochs, narrative forms, media and traditions.

HUMN 273. Evolution of Digital Media. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will trace the origins and development of the digital media products and practices that surround us in contemporary life. Although digital media are often represented as unprecedented and entirely "new," their growth follows patterns that were established in the industrial revolution and that this course will analyze. Crosslisted as ENFS 273.

HUMN 274. Advanced Spatial Humanities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
We define ourselves spatially. To be spatially literate we must develop a critical understanding of maps as political texts written by people from different cultures and designed to express different worldviews. Students will become digital cartographers: utilizing visualization, wayfinding, and gaming software to make and manipulate maps.

HUMN 276. Topics in Comparative and Digital Humanities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This course will focus on a specific theme, problem, topic, or set of issues in a comparative analysis (between different historical periods, media, nations, etc.) and/or in the digital humanities.

HUMN 279. Never Again?: Antisemitism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores antisemitism, yesterday and today, through a variety of texts and provides students with the opportunity to learn about the history of antisemitism in order to become more informed and critically aware of current instances of antisemitism. In English. Crosslisted as GRMN 279.

HUMN 280. Buddhist Philosophy in Comparative Perspective. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A comparative introduction to the major texts, schools and figures of Asian Buddhist traditions, including the early Discourses, the Abhidharma, the Mahayana Sutras, and the works of Nagarjuna, Santideva, Zhiyi, Dogen, and contemporary Engaged Buddhism. Prerequisite: PHIL 100 or permission of the instructor. Crosslisted as PHIL 280.

HUMN 2NT. Humanities Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in Humanities. Prerequisite: permission of the instructor.

HUMN 301. Brain, Mind, Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An interdisciplinary study of the intersections between the humanities and neuroscience in the history of thought and contemporary culture. Prerequisite: permission of the instructor.

HUMN 303. Buddhism in American Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of the transmission of Buddhism to the U.S., with focus on the literature and cultural impact of the writers of the Beat Generation. Prerequisites: RELI 200 or permission of the instructor.

HUMN 305. Utopias: Past, Present, Future. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar course critically investigates the utopian imagination as manifested in various influential texts throughout Asian and Western history, and considers the problems and possibilities of utopian thinking with regard to the present and future.

HUMN 306. US: Fever/Fantasy/Desire. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Seminar on American literature between 1770-1861 with an emphasis on psychoanalytic approaches to literary and cultural study. Authors may include Brown, Sansay, Poe, and Melville. Crosslisted as ENLS 306 and ENLS 606.

HUMN 319. Independent Study. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Individual project of study supervised by instructor. Prerequisite: permission of the instructor. Crosslisted as HUMN 619.

HUMN 320. History of Sexuality. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A cross-cultural and interdisciplinary examination of the signification of sexuality in literature, philosophy, scientific discourse, and the visual arts. Prerequisite: WMST 150 or permission of the instructor. Crosslisted as WMST 325.

HUMN 321. Race & Gender in the 18th Century. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar explores and interweaves a variety of interdisciplinary approaches to apprehend eighteenth-century literature and culture (1660-1800). Focuses may include race, gender, sexuality, ability, class, postcolonialism, transnationalism, and environment. Crosslisted as ENLS 320 and ENLS 620.

HUMN 322. Creativity. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course evaluates the vexed relationship between cultural and economic values by tracing the history of creativity, from the divine creator and artistic genius to the "creative destruction" of capitalist innovation that has given rise to the "creative class" and inspired creative economies—from coops to communes—that envision alternative alternative futures.

HUMN 338. Seminar in Film and Digital Media Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A seminar in film and digital media studies. Topics may include the history of digital media, their relation to other media forms, the relations between critical reflection and media practice/production, and other relevant topics. Prerequisite: ENFS 130 or permission of the instructor.

HUMN 340. Seminar in Translation Studies. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Advanced seminar in the history, theory, and practice of translation, including investigation of the role of translation in intercultural communication and comparative studies. Facility in a language other than English is strongly recommended. Crosslisted as ENLS 362.

HUMN 350. Senior Thesis Workshop. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
A colloquium on issues arising from the writing of a scholarly thesis. Prerequisite: permission of the instructor.

HUMN 351. Honors Tutorial and Senior Thesis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3
Independent study and research leading to the writing of a thesis as approved by the Honors Council. Prerequisite: permission of the instructor.

HUMN 3NT. Humanities Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in Humanities. Prerequisite: permission of the instructor.

Computer Science

Faculty

Professors: Susan Baish (Teaching), Jessen Havill, Luiz Felipe Perrone

Associate Professors: Brian R. King, Alan Marchiori (Chair), Darakhshan Mir, Joshua V. Stough, Lea D. Wittie (Associate Chair)

Assistant Professors: Alexander Fuchsberger (Teaching), Samuel C. Gutekunst, Rajesh Kumar, Sing Chun Lee, Anne Spencer Ross, Todd Schmid, Edward Talmage

Visiting Assistant Professors: Chris Mitsch

Laboratory Director: Lily Romano

The undergraduate programs in computer science stress fundamental principles of computational thinking, including solid theoretical underpinnings, computational methods and models for solving problems, principles for designing computing systems to meet human needs, and techniques for analyzing the effectiveness of these methods, models and systems. They provide students with the conceptual foundation needed to stay at the front of this fast-changing field. For most courses, classroom learning is enhanced through significant faculty-directed, hands-on experience, typically in the form of a regularly scheduled laboratory.

Graduates typically take entry-level positions in hardware and software systems application and design or continue their education at the graduate level.

Program Educational Objectives for the Bachelor of Science Degree

Computer science degree graduates will be successful professionals in computer science or other fields and will be recognized for qualities associated with their Bucknell education. Such qualities include critical thinking, problem-solving and effective communication. Graduates will be prepared to pursue lifelong learning such as professional or advanced education.

A computer science major may be pursued under any one of three degree programs: Bachelor of Arts, Bachelor of Science, and Bachelor of Science in Computer Science & Engineering (see College of Engineering (p. 335)). The Bachelor of Science in Computer Science degree program is accredited by the Computing Accreditation Commission of ABET (ABET.org (http://www.abet.org/)). Students interested in the computer science major should consult the department concerning the choice of degree program.

Bachelor of Arts Major

The **Bachelor of Arts major** curriculum provides the student with an opportunity to combine the liberal arts tradition with strong preparation in computer science. It requires eight course credits in computer science.

CSCI 201	Computer Science Seminar	.5
CSCI 203	Introduction to Computer Science [1]	1
CSCI 204	Data Structures & Algorithms	1
CSCI 205	Software Engineering and Design	1
CSCI 306	Computer Systems	1
CSCI 311	Algorithm Design & Analysis	1
CSCI 345	Computers and Society	1
CSCI 475	Senior Design I [5]	.5
CSCI 476	Senior Design II [5]	1
MATH 201	Calculus I [2]	1
MATH 202	Calculus II [2]	1
MATH 227	Statistics and Engineering [3]	1
MATH 241	Discrete Structures [4]	1
Total Credits		**12**

1 Requirement can be fulfilled with transfer credit for AP Computer Science A. Alternatively, students with programming experience may request placement into CSCI 204 and later substitute this requirement for a CSCI elective.

2 All computer science students are encouraged to pursue a minor in mathematics. Students who have met the requirements for MATH 201 Calculus I and/or MATH 202 Calculus II may want to consider a mathematics minor or a mathematics double major. In addition to the required mathematics courses for the computer science degree, the suggested sequence to complete a mathematics minor is MATH 211 (https://coursecatalog.bucknell.edu/search/?P=MATH%20211) and MATH 343 (https://coursecatalog.bucknell.edu/search/?P=MATH%20343).

3 The MATH 227 Statistics and Engineering requirement may be waived for students who have credit for a substantially similar course, such as AP Statistics or another statistics course required for a second major.

4 Any 1.5-credit or 2.0-credit combination of MATH 280 and MATH 240 or any 1.0 credit Combinatorics & Graph Theory course may replace MATH 241 (note that some MATH courses have MATH 211 as a prerequisite). Students seeking additional depth in mathematics are encouraged to pursue this route as MATH 211 and MATH 280 are prerequisites to several upper-level mathematics courses.

5 Students may substitute CSCI 475 and CSCI 476 with a 1.5 credit senior thesis, honors thesis, OR a culminating experience. A culminating experience is defined as "At least 1.5 credits of 300-level or above coursework, including a significant project, in a single discipline outside computer science."

First Year

First Semester	Credits	Second Semester	Credits
CSCI 203[1]		1 CSCI 204	1
MATH 201[2]		1 MATH 202[2]	1
CASCC[6]		1 CASCC[6]	1
W1 Elective (FOUN or RESC)[7]		1 CASCC[6]	1
		4	**4**

Sophomore

First Semester	Credits	Second Semester	Credits
CSCI 201		.5 CSCI 205	1
MATH 227[3]		1 MATH 241[4]	1
W2 Elective[6,7]		1 CASCC[6]	1
Elective		1 Elective	1
Elective[8]		.5	
		4	**4**

Junior

First Semester	Credits	Second Semester	Credits
CSCI 306		1 CSCI 311	1
CSCI 345		1 CASCC[6]	1
CASCC[6]		1 Elective	1

Elective		1 Elective	1
		4	**4**

Senior

First Semester	Credits	Second Semester	Credits
CSCI 475[5]		.5 CSCI 476[5,7]	1
CASCC[6]		1 CASCC[6]	1
CASCC[6]		1 Elective	1
Elective		1 Elective	1
Elective[8]		.5	
		4	**4**

Total Credits: 32

6 The College of Arts & Sciences Core Curriculum (CASCC) requirements for the College of Arts & Sciences may be met with a variable number of courses. Once all CASCC requirements are met, the CASCC slots in this schedule can be treated as elective courses.

7 Three courses must fulfill the University's writing requirement, which includes a W1 Elective (FOUN or RESC) taken in the first semester and two subsequent W2 courses. (CSCI 476 will count toward one of the required W2 courses.)

8 Students may elect to substitute a 1.0 credit elective for a total of 4.5 credits in this semester.

Bachelor of Science Major

The Bachelor of Science in Computer Science requirements are:

CSCI 201	Computer Science Seminar	.5
CSCI 203	Introduction to Computer Science	1
CSCI 204	Data Structures & Algorithms	1
CSCI 205	Software Engineering and Design	1
CSCI 306	Computer Systems	1
CSCI 307	Computer Networks and Security	.5
CSCI 308	Programming Language Design	1
CSCI 311	Algorithm Design & Analysis	1
CSCI 315	Operating Systems Design	1
CSCI 341	Theory of Computation	1
CSCI 345	Computers and Society	1
CSCI 475	Senior Design I	.5
CSCI 476	Senior Design II	1
MATH 201	Calculus I [2]	1
MATH 202	Calculus II [2]	1
MATH 227	Statistics and Engineering [3]	1
MATH 241	Discrete Structures	1
Lab Science Elective [7]		1
Science Elective [7]		1
Total Credits		**17.5**

Students pursuing a BS in computer science are eligible to pursue a BA in data science as a co-major. Complementing the depth a student receives from their primary major, the BA in Data Science (p. 92) provides breadth across the interdisciplinary field of data science. The major is not intended as – nor can it be declared as – a stand-alone course of study.

The recommended sequence for the bachelor of science major is as follows:

First Year

First Semester	Credits	Second Semester	Credits
CSCI 203[1]		1 CSCI 204	1
MATH 201[2]		1 MATH 202[2]	1
W1 Elective (FOUN or RESC)[8]		1 Science Elective[7]	1

Elective		1 CASCC[6]	1
		4	**4**

Sophomore

First Semester	Credits	Second Semester	Credits
CSCI 201		.5 CSCI 205	1
MATH 227[3]		1 MATH 241[4]	1
Elective[5]		.5 CASCC[6]	1
Lab Science Elective[7]		1 Elective	1
W2 Elective[8]		1	
		4	**4**

Junior

First Semester	Credits	Second Semester	Credits
CSCI 306		1 CSCI 307	.5
CSCI 341		1 CSCI 308	1
CSCI 345		1 CSCI 311	1
CASCC[6]		1 CASCC[6]	1
		Elective[5]	.5
		4	**4**

Senior

First Semester	Credits	Second Semester	Credits
CSCI 315		1 CSCI 476[8]	1
CSCI 475		.5 CASCC[6]	1
CASCC[6]		1 CASCC[6]	1
Elective		1 Elective	1
Elective[5]		.5	
		4	**4**

Total Credits: 32

1. Requirement can be fulfilled with transfer credit for AP Computer Science A. Alternatively, students with programming experience may request placement into CSCI 204 and later substitute this requirement for a CSCI elective.
2. All computer science students are encouraged to pursue a minor in mathematics. Students who have met the requirements for MATH 201 Calculus I and/or MATH 202 Calculus II may want to consider a mathematics minor or a mathematics double major.
3. The MATH 227 requirement may be waived for students who have credit for a substantially similar course, such as AP Statistics or another statistics course required for a second major.
4. Any 1.5-credit or 2.0-credit combination of MATH 280 and MATH 240 or any 1.0 credit Combinatorics & Graph Theory course may replace MATH 241 (note that some MATH courses have MATH 211 as a prerequisite). Students seeking additional depth in mathematics are encouraged to pursue this route as MATH 211 and MATH 280 are prerequisites to several upper-level mathematics courses.
5. Students may elect to take a 1.0-credit elective for a total of 4.5 credits in the semester or a 0.5 credit computer science elective, CSCI 202 Research Methods in sophomore year, second semester.
6. The College of Arts & Sciences Core Curriculum (CASCC) requirements of the College of Arts & Sciences may be met with a variable number of courses. Once all CASCC requirements are met, the CASCC slots in this schedule may be treated as elective courses.
7. Students will choose any two natural science electives. One must have a lab component (LBSC); the other may be any NSMC not in the departments of mathematics or computer science.
8. Three courses must fulfill the University's writing requirement, which includes a W1 Elective (FOUN or RESC) taken in the first semester and two subsequent W2 courses. (CSCI 476 will count toward one of the required W2 courses.)

Computer Science Minor

The minor in computer science requires 4.0 credits in CSCI, numbered 204[1] and above, including at least 1.0 CSCI credit numbered 300 or above.

1. CSCI 204 is recommended for all minors, as it is a prerequisite to multiple CSCI courses.

Graduates of the program are expected to demonstrate the following learning outcomes, which reflect ABET computing accreditation criteria:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

Courses

CSCI 187. Creative Computing and Society: Computing, Creativity and the Social Good. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:2
Introduces computing through creativity and examining social problems, guiding students to create visual artifacts that empower them to draw insights from data, complemented by discussions on computing's societal impact. This course does not count towards the computer science minor. Prerequisite: permission of the instructor. Not open to computer science majors and computer science engineering majors.

CSCI 1NT. Computer Science Non-traditional Study. .25-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in computer science. Prerequisite: permission of the instructor.

CSCI 201. Computer Science Seminar. .5 Credits.
Offered Fall Semester Only; Lecture hours:1.5
A variety of Computer Science related topics presented by faculty, alumni, student speakers, and other relevant guests. Presentations and discussions on the frontier of the discipline, professional development, ethics and societal issues, and other topics relevant to the profession. Prerequisite: open to sophomores. Others by permission of the instructor.

CSCI 202. Research Methods. .5 Credits.
Offered Spring Semester Only; Lecture hours:1.5
An introduction to research methodology in Computer Science, involving reading scientific literature, developing presentation skills, and learning to use various software packages. Prerequisites: open to first years and sophomores. Others by permission of the instructor.

CSCI 203. Introduction to Computer Science. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Students will learn the python programming language in order to explore the capabilities, limits, and social impact of computing. Application areas include image manipulation, data manipulation and visualization, introductions to predictive models, and ethical programming practices. Not open to students who have taken ANOP 203 or ECEG 230.

CSCI 204. Data Structures & Algorithms. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Introduction to data structures and algorithms using an object-oriented approach. Topics include software-engineering principles, object-oriented programming, recursion, basic data structures, algorithm analysis and team programming. Prerequisite: CSCI 203 or ECEG 230 or permission of the instructor.

CSCI 205. Software Engineering and Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Fundamentals of software design and software engineering. Students will participate in large-scale, team-based software development project. Prerequisite: CSCI 204 or permission of the instructor.

CSCI 278. Computer Science Individual Study. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies; Repeatable
Independent study or project in computer science. Prerequisite: permission of the instructor.

CSCI 279. Topics in Computer Science. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies
Current topics of interest. Prerequisite: permission of the instructor.

CSCI 2NT. Computer Science Non-traditional Study. .25-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in computer science. Prerequisite: permission of the instructor.

CSCI 306. Computer Systems. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Fundamental concepts showcasing the integration of hardware and software. Topics include data representation, processor, memory, I/O, Unix system programming in C and assembly, introduction to operating systems, and development tools. Prerequisite: CSCI 204 or permission of the instructor. Not open to students who have taken CSCI 206.

CSCI 307. Computer Networks and Security. .5 Credits.
Offered Spring Semester Only; Lecture hours:1.5
Introduction to network programming including datagram and virtual circuit protocols. Introduction to topics in computer security such as authentication, integrity, access control, applied cryptography and secure programming. Prerequisite: CSCI 206 or CSCI 306.

CSCI 308. Programming Language Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Study of modern programming language paradigms (procedural, functional, logic, object-oriented). Introduction to the design and implementation of programming languages including syntax, semantics, data types and structures, control structures, run-time environments. Prerequisite: CSCI 205 or permission of the instructor. Not open to students who have taken CSCI 208.

CSCI 311. Algorithm Design & Analysis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
An introduction to standard patterns and techniques in algorithm design and tools for analyzing algorithmic performance. Students learn to evaluate algorithms, design new algorithmic solutions, and communicate the correctness and usefulness of their solutions. Prerequisite: MATH 241 or (MATH 240 and MATH 280) and CSCI 204.

CSCI 315. Operating Systems Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Introduction to operating system design including processor management, scheduling, memory management, resource allocation, file systems and concurrency. Prerequisite: CSCI 306.

CSCI 320. Computer Architecture. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Explores two important topics in computer architecture today: memory hierarchy and parallelism in all its forms. Students will use a hardware description language to implement concepts including pipelining, cache and branch prediction. Prerequisite: CSCI 206 or CSCI 306 or ECEG 247 or permission of the instructor. Crosslisted as ECEG 443 and ECEG 643.

CSCI 331. Compiler Optimization. 1 Credit.
Offered Occasionally; Lecture hours:3
Project based introduction to compiler optimization for theoretical and practical issues such as run-time, memory usage, code robustness, and security. Prerequisite: CSCI 308.

CSCI 332. The Internet of Things. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A broad investigation into the design of internet-connected physical objects and the infrastructure that supports them. This hands-on course covers topics including embedded systems, wireless communication, internet protocols, cloud computing and security. Students will develop their own IoT system. Prerequisite: (CSCI 206 or CSCI 306) or ECEG 247. Crosslisted as ECEG 432 and ECEG 632.

CSCI 341. Theory of Computation. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Finite automata, regular sets, pushdown automata, context-free grammars. Turing machines, recursive functions and undecidability. Prerequisite: MATH 241 or MATH 280.

CSCI 345. Computers and Society. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Analysis of the impact of computing on society through the application of deontological and consequence-based ethical theories and professional codes of ethics. Students will learn to analyze the impacts of computing on the fundamental values of society so as to be able to create systems that don't oppose social progress.

CSCI 349. Introduction to Data Mining. 1 Credit.
Offered Occasionally; Lecture hours:3
Data preprocessing, statistical modeling, basic machine learning algorithms for mining large datasets. Topics include association analysis, frequent pattern mining, classification, and clustering. Prerequisites: CSCI 311 and (MATH 216 or MATH 226 or MATH 227).

CSCI 351. Distributed Computing. 1 Credit.
Offered Occasionally; Lecture hours:3
An introduction to concurrency, communication, and fault-tolerance. Students learn fundamental models of distributed computing and use them to study classic problems and their solutions or impossibility. Examples include consensus, mutual exclusion, distributed data structures and more. We focus primarily on theoretical results, also applying them in practical implementations.

CSCI 358. Human Computer Interaction. 1 Credit.
Offered Occasionally; Lecture hours:3
In this interdisciplinary course, we will study research at the intersection of people and computing. Through a variety of prototypes that we'll build (3D user interfaces, visual design, data communication, intelligent user interfaces, etc), we will deliberately practice processes that result in useful, usable and maybe even inspirational computer interfaces.

CSCI 359. Fairness, Privacy, & Transparency When Learning From Data. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course enables students to audit and analyze data-centric systems and processes that are used to make decisions about people's lives and understand the bias, fairness, privacy, and transparency implications of these systems. We will read, discuss, and implement ideas from recently published research articles in this upcoming area.

CSCI 363. Computer Networks. 1 Credit.
Offered Occasionally; Lecture hours:3
Principles and design of networked computing systems and application programs. Topics include reliable communications medium access control, security, routing, transport, congestion control and networked applications. Prerequisite: CSCI 306 or ECEG 247.

CSCI 365. Image Processing & Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Imaging is everywhere! In this course, we will cover broadly the acquisition, processing, and analysis of digital images, covering topics ranging from the human visual system, to image and video compression algorithms, to pattern recognition and machine learning within the context of automatic image understanding.

CSCI 368. Wireless Networks & Applications. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
This course explores the realm of modern wireless technologies and their practical applications, familiarizing students with the ever-evolving landscape of wireless networks. It equips students with a profound understanding of wireless communication principles, protocols and network architectures, covering fundamental concepts such as radio frequency fundamentals, as well as advanced topics. Crosslisted as ECEG 479 and ECEG 679.

CSCI 375. Teaching Assistant in CSCI. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Teaching assistant to support mastery in a core computer science course. Written learning objectives and assessment policies will be developed with the course instructor. Prerequisites: by permission only.

CSCI 376. Computer Science Honors Thesis. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Independent work on computer science honors thesis. Prerequisite: permission of the instructor.

CSCI 378. Individual Study in Computer Science. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Independent study in computer science. Recent areas include graph algorithms, computer security, distributed computing, graphics, programming languages, software engineering, web information retrieval. Prerequisites: junior standing and permission of the instructor.

CSCI 379. Topics in Computer Science. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Current topics of interest.

CSCI 3NT. Computer Science Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study course in computer science. Prerequisite: permission of the instructor.

CSCI 475. Senior Design I. .5 Credits.
Offered Fall Semester Only; Lecture hours:1,Other:2
A recognized software engineering methodology will be used with all phases of a senior design project. Written work will include a technical report about the project, a feasibility report, and a requirements specification document. Prerequisite: permission of the instructor. Not open to students who have taken ENGR 452.

CSCI 476. Senior Design II. 1 Credit.
Offered Spring Semester Only; Lecture hours:2,Other:2
Students undertake several cycles of delivery, each including a design document, product implementation, testing, and feedback. Students produce technical and user's manuals for the final version. Class presentations of designs and implementations. Includes public presentation of the final product and design process. Prerequisites: CSCI 475 and permission of the instructor.

Critical Black Studies

Faculty

Professor: P. Khalil Saucier

Associate Professor: Jaye Austin Williams (Chair)

Assistant Professor: Nicholas Brady

Affiliated Faculty: Nina E. Banks (Economics), Paul Barba (History), Benjamin Barson (Music), Adam Burgos (Philosophy), Kenton Butcher (English), Aisha Cort (Latin American Studies), Raphael Dalleo (English), Cymone Fourshey (History, International Relations), Meenakshi Ponnuswami (English), Jessica Pouchet (Environmental Studies & Sciences), Hiram L. Smith (Spanish)

Critical Black studies is devoted to the critical examination of the artistic, historical, literary, political and theoretical developments of the global Black experience. As a discipline, critical Black studies explores racial blackness and its relationship to the making of the modern world. It is a discipline that continues to grow out of the Black freedom struggle and is therefore committed to rigorous scholarship, community development, and ethical responsibility grounded in the histories and lived experience of Black people.

Critical Black studies offers majors a robust and interdisciplinary curriculum that engages both historical and contemporary issues from a liberal arts perspective. It allows students to ask questions about the production of knowledge and the world around them, while developing critical analytical skills. Majors will develop an understanding of the vital issues, questions and debates driving theory and research in the discipline through written and oral discourse. Critical Black studies provides students significant preparation for careers in education, the arts, social work, public policy, law, community development, medicine, international affairs, academia and much more.

Critical Black studies **majors** must complete nine courses from the following categories, including an independent study, the object of which is to complete a thesis that will fulfill the Culminating Experience. Courses must be selected in consultation with a departmental adviser.

Critical Black Studies Major Requirements (nine courses)

CBST 199	Introduction to Critical Black Studies	1
CBST 250	Approaches to Critical Black Studies	1
One course in history (Africa, African American or Caribbean)		1
Five courses in area specialties: social sciences, humanities and arts; of these courses, two must be at the 200 level and at least one course must be at the 300 level.		5
CBST 399	Independent Study	1

Courses in area specialties are distributed both by division and geography. Students must take the following number of courses from the approved list of critical Black studies divisional courses: two in social sciences, two in humanities and one in the arts. These courses must include the following geographic groupings: one course on Africa, one course on African America, and one course on either the Caribbean or Afro-Latin communities. Courses may count simultaneously for the division and region/spatial community requirements. (As such, a single course may fulfill both a humanities and an Africa requirement.)

Students will fulfill the Culminating Experience by completion of a thesis in an area of critical Black studies. Students will register for an independent study in the fall of their senior year with their faculty adviser. The thesis topic must be confirmed in writing in consultation with the faculty adviser by the end of a student's junior year. (See Honors Council website for consideration as an honors thesis; however, theses do not have to be submitted to the Honors Council to count as the Culminating Experience major requirement for critical Black studies.) Faculty advisers will determine successful completion of the thesis/Culminating Experience requirement by submission of the grade for the independent study.

Critical Black studies majors will become competent writers through their engagement with the wide array of writing tasks required in our courses. Public speaking instruction will occur as a facet of the oral presentation assignments in many of our courses but is specifically required in our two core classes. Through the research skills acquired in our foundational classes (the classes that constitute the major), students will gain information literacy and will be required to demonstrate that literacy through completion of a thesis in their senior year.

These courses contribute to the Department of Critical Black Studies:

Five courses in area specialties: social sciences (two courses), humanities (two courses) and arts (one course); of these courses, two must be at the 200 level and at least one course must be at the 300 level.

Social Sciences (two courses from this list)		2
CBST 204	Racism(s) Across the Americas	
CBST 220	Race, Riots and Resistance	
CBST 227	Race and Sexuality	
CBST 230	Black Radical Politics	
CBST 263	Conservation in Africa	
CBST 271	Politics of Anti-Blackness	
CBST 274	Africa and International Relations in Historical Perspective	
CBST 280	Race, Violence & Incarceration	
CBST 290	Topics in Critical Black Studies	
CBST 295	Hip-Hop and Blackness	
CBST 310	Racial Capitalism	

CBST 315	Race, Sports and Politics
CBST 333	Black Feminisms

Humanities (two courses from this list)		2
CBST 220	Race, Riots and Resistance	
CBST 221	Introduction to African American Literature	
CBST 222	Caribbean Literature	
CBST 223	Questioning the Post-Racial	
CBST 229	Philosophy and Race	
CBST 238	Vampire & Zombies	
CBST 240	Inventions of Black Culture	
CBST 248	Music and Culture: Jazz and Social Justice	
CBST 255	Radical Black Drama & Performance	
CBST 257	Music and Culture: Jazz, Rock, and Race	
CBST 271	Politics of Anti-Blackness	
CBST 290	Topics in Critical Black Studies	
CBST 291	Africa: Ancient to Early Modern Times 4000BCE-1400CE	
CBST 292	Making Contemporary Africa: 'Early Modern' to the 'Post-Modern' World - 1400 to the Present	
CBST 295	Hip-Hop and Blackness	
CBST 302	Contemporary Africa & Colonial Pasts: Investments and Re-Emergences	
CBST 322	Haiti and the American Imagination	

Arts (one course from this list)		1
CBST 201	Introduction to Black Performance	
CBST 235	Black Radical Thought & Art – Multi-disciplinarily Considered	
CBST 255	Radical Black Drama & Performance	
CBST 265	(Really) Reading Black Plays: August Wilson, Part 1	
CBST 267	(Really) Reading Black Plays: August Wilson, Part 2	
CBST 290	Topics in Critical Black Studies	

In some cases, majors may petition the chair for approval/acceptance of other appropriate courses.

Students majoring in critical Black studies are strongly encouraged to spend a semester or a summer abroad, preferably in Africa or the Caribbean. Bucknell in Ghana is particularly encouraged.

Critical Black studies is the study of the global Black experience. As a field of inquiry, critical Black studies critically examines the intellectual traditions and experiences of Black people and Black communities from intra- and interdisciplinary perspectives.

Critical Black studies **minors** must complete a minimum of five courses.

Core requirements:		
CBST 199	Introduction to Critical Black Studies	1
CBST 250	Approaches to Critical Black Studies	1

Three additional courses from the following list:		3
CBST 199	Introduction to Critical Black Studies	
CBST 201	Introduction to Black Performance	
CBST 220	Race, Riots and Resistance	
CBST 221	Introduction to African American Literature	
CBST 222	Caribbean Literature	
CBST 223	Questioning the Post-Racial	
CBST 227	Race and Sexuality	
CBST 229	Philosophy and Race	
CBST 230	Black Radical Politics	
CBST 235	Black Radical Thought & Art – Multi-disciplinarily Considered	
CBST 238	Vampire & Zombies	

CBST 240	Inventions of Black Culture
CBST 248	Music and Culture: Jazz and Social Justice
CBST 250	Approaches to Critical Black Studies
CBST 255	Radical Black Drama & Performance
CBST 257	Music and Culture: Jazz, Rock, and Race
CBST 263	Conservation in Africa
CBST 265	(Really) Reading Black Plays: August Wilson, Part 1
CBST 267	(Really) Reading Black Plays: August Wilson, Part 2
CBST 271	Politics of Anti-Blackness
CBST 274	Africa and International Relations in Historical Perspective
CBST 278	Photographing Race
CBST 280	Race, Violence & Incarceration
CBST 290	Topics in Critical Black Studies
CBST 291	Africa: Ancient to Early Modern Times 4000BCE-1400CE
CBST 292	Making Contemporary Africa: 'Early Modern' to the 'Post-Modern' World - 1400 to the Present
CBST 295	Hip-Hop and Blackness
CBST 302	Contemporary Africa & Colonial Pasts: Investments and Re-Emergences
CBST 310	Racial Capitalism
CBST 315	Race, Sports and Politics
CBST 322	Haiti and the American Imagination
CBST 333	Black Feminisms
CBST 399	Independent Study

Other courses may be selected in consultation with the program director.

Critical Black studies often stands in critical relation to other disciplines and fields of knowledge for the ways in which blackness and the Black experience is primary, rather than secondary, if at all, to the critical exploration of and engagement with this world. Critical Black studies utilizes multi- and interdisciplinary approaches, methods and theories to illustrate the primacy of blackness and the global Black experience. Despite the complexity, enormity, and diversity of the Black world, several learning objectives unify our teaching in critical Black studies at Bucknell University. Students graduating with a major in critical Black studies will be able to:

- demonstrate an understanding of the historical development of critical Black studies as a long-standing and exciting field of knowledge and inquiry;
- identify the important contributors to the field, and explain the relevance of the field for both the academy and community;
- demonstrate an understanding of the historical dimensions of the Black experience as well as the cultural, social, political and economic forces that have helped shape these experiences;
- demonstrate an understanding of the major approaches and methodologies of critical Black studies; and
- apply appropriate theories and methodologies for understanding the global Black experience.

Courses

CBST 199. Introduction to Critical Black Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course introduces students to concepts, theories, and debates of the vibrant discipline of Critical Black Studies. It surveys major themes, questions, concerns, and events of African, African American, and other African diasporic communities. The course examines the making of the modern world through the lens of black global experience.

CBST 201. Introduction to Black Performance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will introduce students to the field of performance theory as it is engaged through the lens of the Black World. It will place scholars in Black performance theory in conversation with scholars working in the black radical tradition whose work raises important questions about performance, blackness, and more.

CBST 204. Racism(s) Across the Americas. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
We explore how the idea of the Americas as a “new world” of discovery and wonder was (and is) entangled with racialized systems of domination. Looking into anti-racist ideas and actions today, the course critically explores the shared histories and common futures of diverse peoples across the Americas. Crosslisted as LAMS 204.

CBST 205. Blaxploitation N the 'Hood. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines films from the '70s and '90s, historically situating the '80s as a decade that parlays '70s Blaxpoitation imagery into both a cultural anxiety about and appetite for those images. These, in turn, help manifest the stark, real-life conditions that the '90s "'hood" films aim to critique.

CBST 206. Black Film in Latin America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course, we will investigate the historical and intellectual grounds of films by and about Black people in Latin America. Crosslisted as LAMS 206.

CBST 210. Language and Race. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An introduction to "non-standard" dialects of English with a primary focus on African-American Vernacular English (AAVE). This course explores the linguistic and non-linguistic factors that give rise to language variation. Crosslisted as LING 210.

CBST 220. Race, Riots and Resistance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to how race riots and resistance shaped American politics. We will study how political violence shaped the racial identity of American citizens and Black people’s struggle for freedom. If you are wondering what can be done about systemic racism, this class provides a helpful critical perspective.

CBST 221. Introduction to African American Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Provides a selection from across the vast array of examples collected under the inadequate rubric “African American Literature.” We'll read poetry, fiction, non-fiction, and drama in order to understand how a group of people who have been written out of American history and culture write themselves back into these stories. Crosslisted as ENLS 221.

CBST 222. Caribbean Literature. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3
Introduction to selected literatures, cultures, and histories of the Caribbean, with close analysis of text and context. When taught in the summer, the course is the core of the Bucknell in the Caribbean summer study abroad program. Crosslisted as ENLS 227 and LAMS 227.

CBST 223. Questioning the Post-Racial. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The term “post-racial” has emerged within public discourse from time to time over the course of America’s existence. From Frederick Douglass to Barack Obama, this expression has described an American aspirational goal. Our class will take a contemporary and literary approach to understanding the limits of the term. Crosslisted as ENLS 223.

CBST 225. African Migrants and European Borders. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores African experiences with living in and migrating to Europe. More specifically, it explores the dynamics of migration across the Mediterranean Sea, citizenship, humanitarianism, migrant labor, cinematic representation, monuments/memorials and more.

CBST 227. Race and Sexuality. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the constructions of and intersections between race and sexuality. It also investigates the ways that these identities/locations have informed understanding of inequality in the U.S. Crosslisted as WMST 227.

CBST 229. Philosophy and Race. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Critical examination of the nature and meaning of "race" in terms of conceptual analysis, experience, social constructionism, feminism, class, ethnicity, politics, colonialism, violence, and redress. Crosslisted as PHIL 229 and POLS 259.

CBST 230. Black Radical Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to the historical formation of the Black Radical Tradition. It focuses on the historical context that shapes Black people’s varying forms of organized resistance and on how political practice shapes the formation of different political ideologies, knowledge, and thought.

CBST 235. Black Radical Thought & Art – Multi-disciplinarily Considered. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
W.E.B. DuBois' assertion of the color-line as the 20th century problem now speaks to this century. We will examine Black Radical Thought as it is enacted through the Arts and host a series of renowned guest artist-activists whose works intervene in the ongoing problem of racism on a global scale. Crosslisted as ENLS 235.

CBST 238. Vampire & Zombies. 1 Credit.
Offered Summer Session Only; Lecture hours:3
This course is designed to (1) introduce the fundamentals of cinematic elements and strategies; and (2) provoke a conversation and several key questions related to the vampire and zombie myths, why their cinematic performances remain so popular and what the implications are of that popularity.

CBST 240. Inventions of Black Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explore the relationship between technological invention and Black culture. We will think through how technology reshaped Black culture – for instance how the phonograph changed Black music. We will also consider how Black people have created new forms of culture as technologies and inventions for life, resistance, and revolution.

CBST 245. Guns in Black and White. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the historical, philosophical, social and political discourse on the relationship between guns and race in American society. It provides an interdisciplinary introduction to America's unique "gun culture" inclusive of laws, policies, notions of self-defense, and more.

CBST 248. Music and Culture: Jazz and Social Justice. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
A critical examination of musicians, movements, and cultural intersections within the development of jazz. Crosslisted as MUSC 248.

CBST 250. Approaches to Critical Black Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will provide students with an introduction to the key intellectual approaches and methods specific to Critical Black Studies.

CBST 255. Radical Black Drama & Performance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on a variety of playwrights who examine the predicament of blackness across a little more than a century. We pay particular attention to plays not just as artistic creations and entertainments, but also as political gestures that address that predicament. Crosslisted as ENLS 254.

CBST 257. Music and Culture: Jazz, Rock, and Race. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A thorough examination of historically important musicians and movements within the context of race and culture. Crosslisted as MUSC 257.

CBST 258. The Digital Life of Black Music. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In the era of streaming, hip hop became the most popular music form in the world. Yet, appropriation and racial inequality persist across the digital sphere. This class will explore where Black sound-making meets digital distribution and how these sites have informed new thinking on the politics of blackness.

CBST 260. Blackness & Diaspora in the Global South: Afrolatinidades in Diaspora. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Afro-Latinx identity challenges the notion that Blackness and Whiteness are THE two political categories of race in the Global South. In this course, we will interrogate Afro-Latinidad via an interdisciplinary survey of history and narrative modes of film, literature, music and popular culture. Crosslisted as LAMS 260.

CBST 263. Conservation in Africa. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Through a series of case studies and a final research project, students will gain in-depth knowledge of conservation efforts on the African continent. Emphasizing local and global contexts, course themes include the colonial origins of protected areas, African environmental activists and scholars, and the multiple methods used in political ecology. Crosslisted as ENST 263.

CBST 265. (Really) Reading Black Plays: August Wilson, Part 1. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will examine the plays of Pulitzer Prize-winning playwright, August Wilson and by extension explore what is so often referred to as the "Black experience" in a regional, national, and global context.

CBST 267. (Really) Reading Black Plays: August Wilson, Part 2. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In Part two of our focus on renowned playwright August Wilson's examination of Black life, we will read the second half of his 10-play cycle: Fences (1957), Two Trains Running (1969), Jitney (1977), King Hedley II (1985) and Radio Golf (1997).

CBST 270. Race-ing Latinidad in US: Dialogues of Blackness & Latinidad. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An interdisciplinary study of the competing definitions of the relationship between Blackness and Latinidad in US culture. We will approach the subject through literature, film and music, through academic articles from various disciplines and through direct contact with the local Latinx population. Crosslisted as LAMS 270.

CBST 271. Politics of Anti-Blackness. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will introduce students to the political history of anti-black racism as a contingent, but consistent formation of domination that shaped the modern world. In particular, this course will help students to form a critical vocabulary for how anti-black racism inform or interact with many political crisis.

CBST 274. Africa and International Relations in Historical Perspective. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
From popular culture: music, film, fashion to digital technologies: cell phones, computers, fit-bits, and GOOGLE-glass to our food: morning coffee, sugar, and spices, we rely on African ideas and resources. Through novels, films, and scholarly articles we examine how International Relations across Africa and with Africa matter in our lives. Crosslisted as HIST 274 and IREL 274.

CBST 278. Photographing Race. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The history of photography is inseparable from histories of race, imperialism, and slavery. This course examines how camera and film technologies affected depictions of race globally. Beginning with the invention of the modern camera, this course traces dynamics of voyeurism, othering, and personhood in photography to the present day. Crosslisted as HIST 278.

CBST 280. Race, Violence & Incarceration. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the dynamic convergence of race, violence, and criminal justice. More specifically, it explores policing and punishment from Reconstruction to contemporary mass incarceration. Police practices, political imprisonment, abolition, and more will also be examined.

CBST 290. Topics in Critical Black Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A variable topics course in which students will take a critical and empowering look at various expressions of Black culture, experience, and thought.

CBST 291. Africa: Ancient to Early Modern Times 4000BCE-1400CE. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of Africa from Ancient economic, social, cultural, economic, and political developments to the Early Modern Era and the rise of Atlantic era trade. This course focuses on social, cultural, political, and economic changes generated by populations across the continent. Crosslisted as HIST 291 and IREL 291.

CBST 292. Making Contemporary Africa: 'Early Modern' to the 'Post-Modern' World - 1400 to the Present. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of African history from the 15th century to the contemporary period. We explore six major themes in African History: The Indian Ocean World, Making of the Atlantic World, Colonialism in Africa, Nationalism and Independence Movements, Post-Colonialism and Issues in the Making of Contemporary Africa. Crosslisted as HIST 292 and IREL 293.

CBST 295. Hip-Hop and Blackness. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore the ways in which hip-hop culture has impacted global youth culture, particularly within the realms of music, film, television, clothing styles, politics, language, public policy, race, gender and sexuality. In summary, it will provide a much-needed perspective on the intersection of hip hop and blackness.

CBST 302. Contemporary Africa & Colonial Pasts: Investments and Re-Emergences. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Globalized investment, oil extraction, Oprah and Bono-endorsed RED products, a rising middle class: This course addresses contemporary political economy, meanings of 'the continent', and colonial legacy in Africa. We draw on human geography, African history, postcolonial and feminist studies, and literature to understand a rapidly changing continent. Crosslisted as GEOG 302.

CBST 310. Racial Capitalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the historical and contemporary relationship between race and capitalism. It will also explore the culture and politics of anti-capitalism, anti-colonialism and more.

CBST 315. Race, Sports and Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the nuanced and controversial relationship between race and sports worldwide. Topics will include social justice and rebellion; political economy; mass media and popular culture; and globalization.

CBST 322. Haiti and the American Imagination. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of selected thematic, aesthetic and ideological issues in writing from the Americas. Crosslisted as ENLS 322 and ENLS 622.

CBST 324. Black Experimental Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar explores the theory, history and aesthetics of Black avant-garde cultural production spanning the twentieth and twenty-first centuries. Texts may include poetry, fiction, music and film. Crosslisted as ENLS 324 and ENLS 624.

CBST 333. Black Feminisms. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the context, development, and outcomes of black feminists in the United States during the second half of the 20th century. Crosslisted as WMST 333 and WMST 633.

CBST 399. Independent Study. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4; Repeatable
Individual study or project, supervised by instructor. Prerequisite: permission of the instructor.

Dance Minor

See Theatre & Dance (p. 311).

Data Science

Faculty

Coordinating Committee: Matthew D. Bailey (Business Analytics), Abby Flynt (Mathematics & Statistics), Brian R. King (Computer Science)

Data science is a growing field that can be used to reveal insight into authorship of old texts, assist in personalized health care, predict future epidemics, understand customer behavior and provide business insight, quantify and predict effects of climate change, and improve automation via tools like computer vision. On our campus, data science can be used to study food insecurity, final exam scheduling, housing and traffic flow. This wide variety of applications is what makes data science so important.

This coordinate major (co-major) provides a suite of linked courses that supplement a technical major in business analytics (BSBA), computer science (BS), statistics (BS), or mathematics (BS) by adding breadth and a liberal arts perspective. These courses will supplement a student's technical major by adding the data science knowledge and skills needed to succeed in their chosen field of endeavor while experiencing the interdisciplinarity of the field and its broader impact across various disciplines.

Bachelor of Arts in Data Science

The BA in data science is only available as a co-major to students whose primary major is a BSBA in Business Analytics (p. 426), BS in Computer Science (p. 79), BS in Statistics (p. 223) or BS in Mathematics (p. 223). These disciplines form the core of data science, so the primary major ensures that students have sufficient depth in a particular field central to data science. Complementing the depth a student receives from their primary major, the BA in data science provides breadth across the interdisciplinary field of data science. The major is not intended as – nor can it be declared as – a stand-alone course of study. No courses may be counted for both majors. Students who have completed this co-major will receive one degree (the BS in their primary major) and have noted on their transcript that they have completed all the major requirements for the BA co-major in data science. They will not receive a BA degree.

The Bachelor of Arts in Data Science requires eight courses.

With a BSBA in Business Analytics

Students majoring in business analytics should choose MATH 201 to satisfy their calculus requirement.

Program Requirements

DATA 250	Fundamentals of Data Science	1
CSCI 204	Data Structures & Algorithms	1
MATH 202	Calculus II	1
MATH 217	Statistics II	1
MATH 245	Linear Algebra	1
Three theme courses		3
Total Credits		**8**

With a BS in Computer Science

Program Requirements

DATA 250	Fundamentals of Data Science	1
MATH 230	Data Visualization & Computing	1
MATH 245	Linear Algebra	1
One technical elective		1
Four theme courses		4
Total Credits		**8**

With a BS in Statistics or BS in Mathematics

Students majoring in statistics should choose MATH 354 as one of their 300-level electives. Students majoring in mathematics must complete MATH 216, MATH 217, MATH 230 and MATH 354 and should choose MATH 354 as one of their 300-level electives. Because of the additional math course requirements, students majoring in mathematics will effectively need to take 10 courses beyond their primary major to fulfill the BA co-major in data science requirements.

Program Requirements

DATA 250	Fundamentals of Data Science	1
CSCI 204	Data Structures & Algorithms	1
One technical elective [1]		1
Four theme courses		4
One ethics course [2]		1
Total Credits		**8**

1 Students majoring in mathematics must use MATH 217 for their technical elective.

2 Students may choose from among PHIL 213, PHIL 220, PHIL 228 or PHIL 274. If a prerequisite course is required, it should be included as one of the theme courses.

Technical Electives

ANOP 330	Predictive Analytics: Machine Learning Fundamentals for Business	1
CSCI 311	Algorithm Design & Analysis	1
CSCI 349	Introduction to Data Mining	1
CSCI 365	Image Processing & Analysis	1
GEOL 230	Environmental GIS	1
GEOL 334	Geophysics	1
GEOG 204	Applied G.I.S.	1
MATH 217	Statistics II	1
MATH 354	Modern Data Analysis	1
SOCI 209	Analyzing the Social World	1

Theme Courses

Students interested in this co-major must prepare a brief proposal for their theme courses in conjunction with their academic adviser and then submit it to the Data Science Coordinating Committee for approval. The courses should be focused on a data science-related theme of their own design (e.g., visualization, ethics, communication) and not a broad discipline, and that theme should be one that allows the possibility of data science-related activities, either within the courses themselves or in the student's future career or further education. The proposal should include a list of at least six potential courses that fit their proposed theme. At least two courses must be in arts & humanities, and students may select at most two 100-level courses. If the chosen ethics course for statistics/mathematics majors requires a 100-level prerequisite, the student may select at most three 100-level theme courses. No more than one theme course may be in ANOP/CSCI/MATH. A list of sample theme courses is available from the Data Science Coordinating Committee.

Students earning a B.A. in Data Science will:

1. Strengthen skills in visualization, writing and presentation of data (1, 6, 7)
2. Understand both the technical aspects of data science and how human, social and institutional structures shape technical work (1, 2, 6, 8, 9)

3. Learn about ethical actions when managing and analyzing data (2, 5)

Numbers in parentheses reflect related Educational Goals (https://coursecatalog.bucknell.edu/educationalgoals/) of Bucknell University.

Courses

DATA 250. Fundamentals of Data Science. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to the concepts, core techniques and software of data science; emphasizing both data science principles and methods. Topics may include: computational libraries for data science and visualization; statistical and machine learning algorithms for regression, classification and clustering. Prerequisites: CSCI 204 and MATH 216 or MATH 227.

DATA 306. Data Science & Statistical Consulting. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Experiential learning course where students work on collaborative data focused projects alongside project stakeholders. Students will also learn about and engage with important topics related to the art and practice of data science. Advanced statistical software will be used.

East Asian Studies

Faculty

Professor: Elizabeth L. Armstrong (Teaching)

Associate Professors: Song Chen, Erik R. Lofgren (Chair), James J. Orr, Xi Tian

Assistant Professor: Yunjing Xu

Visiting Assistant Professor: Yuka Kaneko Hughes

The civilizations of East Asia offer a wealth of human experience of invaluable import to every academic discipline. Unbroken cultural lines of great antiquity lead to modern East Asian cultures of ever-growing global significance. Whether we look to the past, the present or the future, in studying East Asia, we study ourselves and our world.

A traditional liberal education that is limited to the study of “Western” civilization is no longer a liberal education. The Department of East Asian Studies, therefore, offers courses for all Bucknell students, regardless of language ability, as well as the special interests of students choosing any of the department's three majors or minors: Chinese, Japanese or East Asian studies. The Chinese and Japanese majors focus on in-depth knowledge of a specific country through extended engagement with its primary language combined with a range of focused culture courses. The East Asian Studies major provides a broader overview of the region through a combination of culture courses focused on both China and Japan, and at least a year of language study in either Chinese or Japanese.

All students majoring or minoring in the Department of East Asian Studies are strongly encouraged to seek opportunities for summer, semester, or preferably full-year study in China or Japan. Bucknell is a member of the Associated Kyoto Program (http://www.associatedkyotoprogram.org), under which students may, if accepted, spend part or all of their junior year at Doshisha University in Japan. Many other opportunities to study in East Asia also are available.

East Asian Studies offers three distinct majors: Chinese and Japanese, which both emphasize language and focused cultural competency; and East Asian Studies, which emphasizes a broad exposure to the cultures of both China and Japan.

Chinese Major

The major entails a program of study (created in consultation with a department adviser) focused on the history, culture and language of China, and requires a minimum of 10 courses:

Proficiency in Chinese language at the 202 level, and at least two of these language courses taken at Bucknell. Native speakers of Chinese must demonstrate Japanese language proficiency at the 202 level, and at least two of these language courses must be taken at Bucknell.		2
One course in Chinese history: [1]		1
EAST 233	China from Ancient Time to 18th Century	
EAST 234	China Since 1800	
EAST 267	The People's Republic of China	
One course in Chinese literature or film:		1
EAST 208	The Red Brush: Women Writers in Imperial China	
EAST 213	Chinese Literature in Translation	
EAST 228	China Through the Lens	
EAST 229	Love, Crime, and the Supernatural: Late Imperial Chinese Fiction	

EAST electives focused on China		2
CHIN or EAST electives		2
One EAST course outside the China focus [2]		1
EAST 395	East Asian Studies Honors Thesis [3]	1
or EAST 400	East Asian Studies Senior Thesis	

1 Only one 100-level EAST course may be counted toward the major.
2 Students should consult with their East Asian Studies adviser or chair.
3 Culminating Experience.

The department encourages majors and potential majors, especially those considering a double major, to consult early and frequently with an EAST faculty member to explore ways to systematically connect and expand work completed in the culture courses taken for the major with the research project that forms the core of the Culminating Experience.

The Culminating Experience provides students an opportunity to pursue focused research on a subject relevant to their concentration and of interest to them. The Culminating Experience must: involve substantial writing, involve substantial research, incorporate Chinese-language sources (Japanese-language sources for native speakers of Chinese) or, treat in depth some aspect of the culture of China, and be presented at the spring Majors' Symposium.

All students majoring in Chinese will receive instruction in writing, speaking and information literacy in the discipline through experiences in the language courses, culture courses and the Culminating Experience that each major completes.

East Asian Studies Major

The major provides a broad introduction to the histories and cultures of China and Japan, and entails a program of study (created in consultation with a department adviser) that requires a minimum of 10 courses:

Proficiency in Chinese or Japanese language at the 102 level, and at least one Chinese or Japanese language course taken at Bucknell or on an approved abroad program. Native speakers of either Chinese or Japanese must demonstrate this proficiency in the other language.		1
Five cultural courses comprising one course from each of the following areas of study: [1]		5
Chinese history:		
EAST 233	China from Ancient Time to 18th Century	
EAST 234	China Since 1800	
EAST 267	The People's Republic of China	
Japanese history:		
EAST 254	From Shinto to Shogun: Pre-modern Japan	
EAST 255	Modern Japanese History	
EAST 256	Contemporary Japanese History	
Chinese literature or film:		
EAST 208	The Red Brush: Women Writers in Imperial China	
EAST 213	Chinese Literature in Translation	
EAST 228	China Through the Lens	
EAST 229	Love, Crime, and the Supernatural: Late Imperial Chinese Fiction	
Japanese literature or film:		
EAST 212	Modern Japanese Literature in Translation	
EAST 220	Japanese Warrior in Literature	
EAST 222	Passion/Perversion: Japan Film	
Religious studies:		
EAST 251	Buddhism	
EAST 252	Chinese Communist Religion	
Three additional EAST electives:		3
EAST 395	East Asian Studies Honors Thesis [2]	1
or EAST 400	East Asian Studies Senior Thesis	

1 Only one 100-level EAST course may be counted toward the major.
2 Culminating Experience.

The department encourages majors and potential majors, especially those considering a double major, to consult early and frequently with an EAST faculty member to explore ways to systematically connect and expand work done in the culture courses taken for the major with the research project that forms the core of the Culminating Experience.

The Culminating Experience provides students an opportunity to pursue focused research on a subject relevant to their concentration and of interest to them. The Culminating Experience must: involve substantial writing, involve substantial research, treat in depth some aspect of the culture of Japan or China, and be presented at the spring Majors' Symposium.

All students majoring in East Asian Studies will receive instruction in writing, speaking and information literacy in the discipline through experiences in the language courses, culture courses and the Culminating Experience that each major completes.

Japanese Major

The major entails a program of study (created in consultation with a department adviser) focused on the history, culture and language of Japan, and requires a minimum of 10 courses:

Proficiency in Japanese language at the 202 level, and at least two of these language courses taken at Bucknell. Native speakers of Japanese must demonstrate Chinese language proficiency at the 202 level, and at least two of these language courses must be taken at Bucknell.		2
One course in Japanese history: [1]		1
EAST 254	From Shinto to Shogun: Pre-modern Japan	
EAST 255	Modern Japanese History	
EAST 256	Contemporary Japanese History	
One course in Japanese literature or film:		1
EAST 212	Modern Japanese Literature in Translation	
EAST 220	Japanese Warrior in Literature	
EAST 222	Passion/Perversion: Japan Film	
EAST electives focused on Japan		2
JAPN or EAST electives		2
One EAST course outside the Japan focus [2]		1
EAST 395	East Asian Studies Honors Thesis [3]	1
or EAST 400	East Asian Studies Senior Thesis	

1 Only one 100-level EAST course may be counted toward the major.
2 Students should consult with their East Asian Studies adviser or chair.
3 Culminating Experience.

The department encourages majors and potential majors, especially those considering a double major, to consult early and frequently with an EAST faculty member to explore ways to systematically connect and expand work completed in the culture courses taken for the major with the research project that forms the core of the Culminating Experience.

The Culminating Experience provides students an opportunity to pursue focused research on a subject relevant to their concentration and of interest to them. The Culminating Experience must: involve substantial writing, involve substantial research, incorporate Japanese-language sources (Chinese-language sources for native speakers of Japanese) or, treat in depth some aspect of the culture of Japan, and be presented at the spring Majors' Symposium.

All students majoring in Japanese will receive instruction in writing, speaking and information literacy in the discipline through experiences in the language courses, culture courses and the Culminating Experience that each major completes.

Minor in East Asian Studies

The department offers three **minors**.

East Asian Studies Minor

Five EAST courses		5
A minor in East Asian Studies consists of five coherently-grouped department courses, of which one must be selected from the following:		
EAST 233	China from Ancient Time to 18th Century	
EAST 234	China Since 1800	
EAST 254	From Shinto to Shogun: Pre-modern Japan	
EAST 255	Modern Japanese History	

EAST 256	Contemporary Japanese History
EAST 267	The People's Republic of China

Minor in Chinese

A minor in Chinese consists of six department courses, of which four must be in the respective language.

Minor in Japanese

A minor in Japanese consists of six department courses, of which four must be in the respective language.

At the completion of the program, students in East Asian studies will be able to:

1. Demonstrate a working knowledge of the history of Japan, China or Korea, and their basic chronologies.
2. Demonstrate a nuanced understanding of contemporary culture of their country of concentration, informed by the unique mix of academic disciplines in each student's curriculum.
3. Discern major issues of cross-regional social, historical or cultural importance.
4. Present ideas coherently in speech in the language of concentration.
5. Present ideas coherently in writing in the language of concentration.
6. Read basic fiction and non-fiction and be able to converse confidently about topics related to those materials.
7. Understand Japanese or Chinese spoken at a natural speed.

Chinese Courses

CHIN 101. Chinese I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:2
Intensive introduction to spoken and written "Mandarin" Chinese, the puutonghuah (common language) of modern China.

CHIN 102. Chinese I. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:2
Intensive introduction to spoken and written "Mandarin" Chinese, the puutonghuah (common language) of modern China. Prerequisite: CHIN 101.

CHIN 103. Chinese II. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:2
Continued rigorous study of spoken and written "Mandarin" Chinese now called puutonghuah (the common language). Prerequisite: CHIN 102 or equivalent.

CHIN 104. Chinese II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:2
Continued rigorous study of spoken and written "Mandarin" Chinese now called puutonghuah (the common language). Prerequisite: CHIN 103 or equivalent.

CHIN 201. Chinese III. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Continued study of modern "Mandarin." Contemporary essays, movie scripts, short stories and newspaper articles. Equal emphasis on reading and speaking. Conducted in Chinese. Prerequisite: CHIN 104 or equivalent.

CHIN 202. Chinese III. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Continued study of modern "Mandarin." Contemporary essays, movie scripts, short stories and newspaper articles. Equal emphasis on reading and speaking. Conducted in Chinese. Prerequisite: CHIN 201 or equivalent.

CHIN 203. Chinese IV. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Reading and discussion of selected modern Chinese texts: newspaper and magazine articles, essays, short stories, and film scripts. Conducted in Chinese. Prerequisite: CHIN 202 or equivalent.

CHIN 204. Chinese IV. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Reading and discussion of selected modern Chinese texts: newspaper and magazine articles, essays, short stories, and film scripts. Conducted in Chinese. Prerequisite: CHIN 203 or equivalent.

CHIN 301. Chinese V. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Study of Chinese films and film scripts and an introduction to Classical Chinese. Besides reading and speaking, interpreting and writing essays are emphasized. Prerequisite: CHIN 204 or equivalent.

CHIN 302. Chinese V. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
Study of Chinese films and film scripts and an introduction to Classical Chinese. Besides reading and speaking, interpreting and writing essays are emphasized. Prerequisite: CHIN 301 or equivalent.

CHIN 310. Advanced Seminar in Chinese Study. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Selected topics in Chinese studies. In Chinese. Course topic varies. Prerequisite: permission of the instructor.

CHIN 319. Independent Studies in Chinese. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Independent projects conducted in Chinese in the student's area of special interest. Prerequisite: permission of the instructor.

CHIN 320. Independent Studies in Chinese. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Independent projects conducted in Chinese in the student's area of special interest. Prerequisite: permission of the instructor.

East Asian Studies Courses

EAST 120. Introduction to Chinese Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introductory course on Chinese culture from antiquity to the middle of the 20th century, covering philosophy, literature and arts.

EAST 131. Introduction to Brush Calligraphy: Character Composition Practicum. .5 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Other:1.5
This course is an introduction to the art of brush calligraphy. Students will engage in the practice of composing Chinese characters. Those who are interested in Japanese, Chinese or studio art are encouraged to participate.

EAST 132. Brush Calligraphy II. .5 Credits.
Offered Spring Semester Only; Lecture hours:Varies,Other:1.5
This course is a continuation of EAST 131. The course aims to cultivate abilities that will enable students to engage in the practice of brush calligraphy, express their views and ideas about calligraphy and to relate broadly to how written language and art converge in culture and tradition.

EAST 134. Modern China Through Digital Lenses. 1 Credit.
Offered Summer Session Only; Lecture hours:2,Other:5
In this course, we use computational tools (Voyant, ImageJ, Neatline, ArcGIS Story Map) to study the history of modern China (1800-2000). We focus on several influential figures in the 19th and 20th centuries whose ideas and actions transformed the intellectual and political landscape of the country.

EAST 203. Digital Methods in Chinese Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:.5,Other:2.5
This course introduces students to digital tools and resources in Chinese studies. Topics include data mining, database design, and data visualization. It combines discussion of digitally-empowered scholarship in Chinese studies and training in the technical know-how. Knowledge of Chinese language, Chinese history, or programming is not required. Crosslisted as HIST 203.

EAST 205. Introduction to Translation Studies. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
An introduction to the history, theories, and development of the field of Translation Studies. Facility in one language other than English is strongly recommended. Crosslisted as HUMN 260.

EAST 208. The Red Brush: Women Writers in Imperial China. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course we explore the writings of Chinese women from the 1st to the early 20th centuries, and discuss the changing social and historical contexts within which these women wrote, and the obstacles these women writers had to overcome in order to ensure that their voices were heard. Crosslisted as WMST 208.

EAST 209. Society and Culture in Imperial China. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This course explores, in depth, a diversity of topics in pre-modern Chinese history from an interdisciplinary and comparative perspective. Besides Chinese history, we also discuss sociological/anthropological theories and history of other parts of the world. Thematic and temporal focus changes in each offering. Possible topics include economy, state, elite, religion. Crosslisted as HIST 209.

EAST 212. Modern Japanese Literature in Translation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Literary trends in 20th-century Japan with emphasis on the development of the modern novel and short story. Works by Soseki, Tanizaki, Kawabata, Mishima, Abe, Enchi, Murakami and others. Taught in English.

EAST 213. Chinese Literature in Translation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Great works of modern and contemporary Chinese literature.

EAST 220. Japanese Warrior in Literature. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Traces the literary (re)construction of the 'warrior' in Japanese literature, from the samurai of the 12th century to the Imperial soldier of the mid 20th century. Taught in English.

EAST 222. Passion/Perversion: Japan Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
A discussion class in which numerous modern Japanese films are used to explore the representation of desire, both passionate and perverse. WARNING: explicit sexual content. Crosslisted as WMST 221.

EAST 226. East Asian Politics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course surveys political history, political institutions, economy, and society of major countries in East Asia, with focus on the continuity and changes in politics and policies of China, Japan, and Korea. Crosslisted as IREL 226 and POLS 226.

EAST 227. Health and Healing in Chinese History. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
This course explores the diverse and evolving concepts of body, health and illness, as well as therapeutic theories and practices in Chinese history from pre-imperial times (circa 5th century BCE) to the twentieth century.

EAST 228. China Through the Lens. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
A history of cinema in mainland China, its origin and important periods, movements, and "generations," as well as representative cinemas of Taiwan and Hong Kong.

EAST 229. Love, Crime, and the Supernatural: Late Imperial Chinese Fiction. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar explores “huaben”, a maturing vernacular fiction genre starting early 17th century in China. We will discuss the social and cultural context that gave rise to this genre, the intersections between this genre and other literary, performative, and artistic genres, as well as its modern implications.

EAST 231. Arts of East Asia. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This course introduces you to the art of China, Korea, and Japan from prehistory to the present. We examine a broad range of objects-ritual bronze vessels, Buddhist temple architecture, Neo-Confucian landscape painting, and ukiyo-e woodblock prints-to emphasize how cross-cultural exchanges stimulated new interpretations across time and space. Crosslisted as ARTH 231.

EAST 233. China from Ancient Time to 18th Century. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Chinese history and culture from their beginnings to the middle of the Qing Dynasty, before that dynasty and China were challenged by the West. Crosslisted as HIST 293.

EAST 234. China Since 1800. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
China from the eve of its modern confrontation with the West to the present through years of traumatic challenge and change. Crosslisted as HIST 294.

EAST 238. Readings in Chinese History: Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will read a diversity of historical materials from pre-modern China. Readings are in Chinese, and class discussion focuses on interpretation. English-language introductions and scholarly publications may be included to provide contextual information. Basic knowledge of classical/literary Chinese (wenyanwen) is required.

EAST 248. International Relations of East Asia. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course offers an overview of international relations in East Asia, with focus on political, economic, and social interactions among major states in the region. Crosslisted as IREL 283 and POLS 283.

EAST 251. Buddhism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Interdisciplinary introduction to Buddhism, including basic teachings of liberation from suffering, impermanence, no-self, ethics, and meditation. Also explores the historical development of various streams of Buddhism in Asia and the West, with attention to the effect of Buddhism on society, politics, and material culture. Crosslisted as RELI 200.

EAST 252. Chinese Communist Religion. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on religion in modern China under the leadership of the Chinese Communist Party. It examines the development of Buddhism, Taoism, popular religions, and western religions in China, from ancient times to the present day, against the backdrop of political ideology that traditionally deems religion "the opiate of the masses." Crosslisted as RELI 245.

EAST 254. From Shinto to Shogun: Pre-modern Japan. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course will examine the cultural and institutional developments which constitute the Japanese heritage, with emphasis on classical Heian and early medieval court culture and late medieval samurai society. Crosslisted as HIST 295.

EAST 255. Modern Japanese History. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Japan from a few hundred samurai-ruled domains loosely held together by a shogun to a bureaucratic modern nation-state in service to an emperor: small wars won, expansive empire gained, cosmopolitan cities built, and a big war lost. Crosslisted as HIST 296.

EAST 256. Contemporary Japanese History. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:1
Political and cultural history of post-World War II Japan using various sources including film, anime, art, political cartoon, popular song. Crosslisted as HIST 286.

EAST 264. The Cold War in Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores how the Cold War developed in Asia.

EAST 265. China and Africa: Past and Present. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course discusses China's evolving relationship with Africa in the recent two centuries and how it was shaped by ideology, China's domestic politics, and its international standing.

EAST 266. Chinese Philosophy. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An introduction to Chinese thought, including: the major schools and thinkers of the classical age, Chinese Buddhist philosophy, early modern Neo-confucianism, and Chinese philosophy since the Communist Revolution of 1949. Crosslisted as HUMN 266 and PHIL 266.

EAST 267. The People's Republic of China. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
A historical look at life in China under the rule of the Communist Party. Unprecedented triumphs and tribulations. Crosslisted as HIST 297.

EAST 269. Chinese Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This examines China's rich political history, its dynamic economic and social changes, its lasting political culture, it enduring struggle for modernization, and its evolving relations with the rest of the world. Crosslisted as IREL 225 and POLS 225.

EAST 275. History of Korea 1800-Present. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the shaping of modern Korea.

EAST 295. Topics in East Asian Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary.

EAST 299. Topics in the History of the Third World. 1 Credit.
Offered Occasionally; Lecture hours:3
History of Vietnam.

EAST 321. Independent Study. 1 Credit.
Offered Fall Semester Only; Lecture hours:3; Repeatable
Individual program of reading, research, or writing. Prerequisite: permission of the instructor.

EAST 322. Independent Study. 1 Credit.
Offered Spring Semester Only; Lecture hours:3; Repeatable
Individual programs of reading, research, or writing. Prerequisite: permission of the instructor.

EAST 330. Hokusai and the Global Art of Edo. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
From luminous golden folding screens to delicate lines in woodblock prints, the arts of Edo (1603-1868) Japan profoundly impacted artists worldwide. How is this art global when seclusion policies of the era forbade foreign travel? Such questions guide our discussion as we focus particularly on artworks in the Samek Museum. Crosslisted as ARTH 330.

EAST 339. China & East Asian Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An analysis of economic transition and development in China, with emphasis on its role in the Asia-Pacific and world economies. Prerequisites: ECON 202 and ECON 203 or permission of the instructor. Crosslisted as ECON 339.

EAST 369. Seminar in East Asian History and Culture. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
A multidisciplinary seminar for Japanese and East Asian Studies majors. Bibliography, sources and disciplinary approaches to East Asia.

EAST 370. Seminar in East Asian History and Culture. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
A multidisciplinary seminar for Japanese and East Asian Studies majors. Individual and group studies of selected topics.

EAST 382. U.S.-China Relations. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Through tracing the evolution of U.S.-China relations from the 18th century to the present, this course discusses major issues and challenges between the two countries today. Future trends of the bilateral relationship will also be explored. Prerequisite: POLS 170. Preference given to POLS/IREL/EAST majors. Crosslisted as IREL 482 and POLS 382.

EAST 395. East Asian Studies Honors Thesis. 1 Credit.
Offered Fall Semester Only; Lecture hours:Varies,Other:3
Focused research relevant to department Culminating Experience. Prerequisite: permission of the instructor. Seniors only.

EAST 400. East Asian Studies Senior Thesis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Focused research relevant to department Culminating Experience. Prerequisite: permission of the instructor. Seniors only.

Japanese Courses

JAPN 101. Japanese I. 1 Credit.
Offered Fall Semester Only; Lecture hours:5,Recitation:2
Beginning language skills. Training in speaking and comprehending the basic sentence patterns of modern Japanese. Introduction to reading and writing.

JAPN 102. Japanese I. 1 Credit.
Offered Spring Semester Only; Lecture hours:5,Recitation:2
Beginning language skills. Training in speaking and comprehending the basic sentence patterns of modern Japanese. Introduction to reading and writing. Prerequisite: JAPN 101 or the equivalent.

JAPN 103. Japanese II. 1 Credit.
Offered Fall Semester Only; Lecture hours:Varies,Recitation:3
Continued training in the four language skills. Review of basic and introduction to complex sentence patterns. Reading of texts in basic Japanese. Prerequisite: JAPN 102 or the equivalent.

JAPN 104. Japanese II. 1 Credit.
Offered Spring Semester Only; Lecture hours:Varies,Recitation:3
Continued training in the four language skills. Review of basic and introduction to complex sentence patterns. Reading of texts in basic Japanese. Prerequisite: JAPN 103 or the equivalent.

JAPN 201. Japanese III. 1 Credit.
Offered Fall Semester Only; Lecture hours:5,Other:1
Application of the four language skills. Reading of texts written in standard Japanese and exercises in content-controlled conversation. Prerequisite: JAPN 104 or equivalent.

JAPN 202. Japanese III. 1 Credit.
Offered Spring Semester Only; Lecture hours:5,Other:1
Application of the four language skills. Reading of texts written in standard Japanese and exercises in content-controlled conversation. Prerequisite: JAPN 201 or equivalent.

JAPN 203. Japanese IV. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Continued application of the four language skills. Reading and guided discussion of texts related to a variety of topics. Prerequisite: JAPN 202 or the equivalent.

JAPN 204. Japanese IV. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
Continued application of the four language skills. Reading and guided discussion of texts related to a variety of topics. Prerequisite: JAPN 203 or the equivalent.

JAPN 301. Japanese V. 1 Credit.
Offered Fall Semester Only; Lecture hours:4; Repeatable
Reading and discussion of selected materials. Exercises in the research skills of writing and presenting reports in Japanese. Prerequisite: JAPN 204 or the equivalent.

JAPN 302. Japanese V. 1 Credit.
Offered Spring Semester Only; Lecture hours:4; Repeatable
Reading and discussion of selected materials. Exercises in the research skills of writing and presenting reports in Japanese. Prerequisite: JAPN 301 or the equivalent.

JAPN 310. Japanese Studies Advanced Seminar. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3; Repeatable
Advanced study of Japanese/English translation. Prerequisite: JAPN 202 or higher.

JAPN 319. Independent Studies in Japanese. .5-1 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Other:Varies; Repeatable
Independent projects conducted in Japanese in the student's area of special interest. Prerequisite: permission of the instructor.

JAPN 320. Independent Studies in Japanese. 1 Credit.
Offered Spring Semester Only; Lecture hours:3; Repeatable
Independent projects conducted in Japanese in the student's area of special interest. Prerequisite: permission of the instructor.

Economics

Faculty

Professors: Erdogan Bakir, Nina E. Banks, Thomas C. Kinnaman, Janet T. Knoedler (Co-chair), David Kristjanson-Gural, Christopher S. P. Magee (Co-chair), Geoffrey E. Schneider, Matías Vernengo, Amy M. Wolaver

Associate Professors: Shahram Azhar, Vahid Gholampour, Carl Shu-Ming Lin, Christine Ngo

Assistant Professors: Rachel Landsman, Stephan Lefebvre, Ozlem Omer Cender, Jacob Powell, Shanike Smart

Visiting Assistant Professors: Nawaraj Paudel, Ivan Dario Velasquez-Garzon

The study of economics, as with the other social sciences, attempts to explain various types of human behavior and the impact that society's institutions have in determining that behavior. Of particular interest are the forces that determine an economy's production, employment, distribution of income, poverty and international economic relationships.

Economics at Bucknell is also an integral part of the liberal arts. The department's primary goal is to cultivate patterns of inquiry that produce economic literacy, independent thinking and a commitment to lifelong learning and a socially responsible life.

A major in economics offers a background for careers in law, journalism, finance and consulting, government and international affairs, teaching, industrial relations, public service and many others. The major also provides the essential first stage for students interested in graduate work in economics, and a solid foundation for the graduate study of business, public policy and the law.

Major in Economics

Requires 10 course credits.

ECON 101	Economic Principles/Problems	1
Three intermediate theory courses:		
ECON 202	Intermediate Microeconomics	1
ECON 203	Intermediate Macroeconomics	1
ECON 204	Intermediate Political Economy	1
Three Economic electives, two at the 300 level or above		3
Culminating Experience (400-level economics seminar)		1
Major related courses: [1]		
MATH 192	Topics in Calculus [2]	1
or MATH 201	Calculus I	
MATH 216	Statistics I [3]	1

1. Calculus must be taken in the first three semesters before the student applies to the major. Statistics should be taken in the first four semesters. Intermediate core economics theory courses should be completed by the end of the junior year.
2. Or another course to fulfill the calculus requirement.
3. Or another course to fulfill the statistics requirement.

Although economics courses are offered at the 200, 300 and 400 levels, economics majors must take at least two electives at the 300 level or above. Majors are encouraged to consult with their academic adviser when selecting economics electives.

Students may transfer as many as two off-campus course credits to meet the requirements of the economics major. This restriction does not apply to transfer students. In addition, all economics courses taught by or sponsored by Bucknell faculty members in the Bucknell in Cape Town, Bucknell en España, Bucknell en France, Bucknell in Barbados, or Bucknell in London programs will count toward the major and the minor. Courses taken off campus will count as 200 level unless they require intermediate economics courses (ECON 202 Intermediate Microeconomics, ECON 203 Intermediate Macroeconomics, ECON 204 Intermediate Political Economy, or the equivalent). Students should provide clear information about the character and quality of off-campus courses to the department chair for student issues to determine if these courses adequately substitute for material that would be taught on campus.

Each academic year, the department will solicit applications from all potential majors. Criteria for acceptance to the program will emphasize academic achievement in core economics courses and completion of calculus. Please see the economics department website for specific and up-to-date details and pre-application requirements.

Students interested in pursuing postgraduate work in economics upon graduation from Bucknell are strongly encouraged to take the following mathematics courses:

MATH 201	Calculus I	1
MATH 202	Calculus II	1
MATH 211	Calculus III	1
MATH 216	Statistics I	1
MATH 303	Probability	1
MATH 304	Statistical Inference Theory	1

Other mathematics courses (for example, MATH 245 Linear Algebra, MATH 212 Differential Equations) are also helpful. In addition, students preparing for graduate study in economics should strongly consider taking ECON 241 Econometrics. Please see the economics department graduate school adviser as early in your degree program as possible for additional information and guidance.

The economics major contributes to the College of Arts & Sciences Core Curriculum (CASCC) by introducing three intellectual skills required of all majors. *Information literacy* is introduced in ECON 202 Intermediate Microeconomics and ECON 203 Intermediate Macroeconomics, when students will be introduced to microeconomic and macroeconomic data and/or information sources used to perform economic analysis. In statistics (MATH 216 Statistics I), a corequisite course for the major, students will learn about statistical inference, another key component of information literacy in economics. *Writing within the curriculum* will be developed in the senior Culminating Experience course. Students in this course will be given repeated opportunities to write about economics in a clear and cohesive manner. Finally, *speaking* will also be introduced in the senior Culminating Experience course. In each seminar, students will give a formal presentation and will write a research paper in economics, which will require them to reference peer-reviewed scholarship.

The senior seminar serves as the Culminating Experience for the economics major. All senior seminars require intermediate theory courses as prerequisites and serve to culminate the accumulated body of economics knowledge and experience. Some senior seminars will also build upon calculus and statistics. The Culminating Experience requirement may also be fulfilled if a student completes an honors thesis.

Additional Courses Accepted for Economics Credit

ANTH 266	Money, Markets and Magic	1
GEOG 209	Economic Geography	1
HIST 225	Topics in American Political and Economic History (History of Capitalism)	1

Economics Minor

ECON 101	Economic Principles/Problems	1
Four economics electives		4

All economics courses taught by or sponsored by Bucknell faculty members in the Bucknell in Cape Town, Bucknell en España, Bucknell en France, Bucknell in Barbados, and Bucknell in London programs will count toward the minor. Students in other off-campus programs may count up to two off-campus courses toward the minor. ECON 104, ECON 1AP and ECON 1TR do not count toward the minor.

Majors in economics will be able to:

- Identify and analyze mainstream and heterodox economic concepts, theories and tools. (1, 2, 3, 4, 5, 6, 9)
- Summarize, explain and critically analyze economic arguments orally and in writing. (1, 7)
- Locate and interpret economic data. (1, 6, 8)
- Locate, interpret and assess sources of economic information. (1, 8, 9)
- Develop skills and knowledge that provide a foundation for pursuing lifelong learning and a socially responsible life. (3, 5, 9)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

ECON 101. Economic Principles/Problems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
General introduction to both macroeconomics and microeconomics, along with an introduction to economic history, international economics, and political economy. The course also examines the origin of economic ideas in the works of Adam Smith, John Maynard Keynes, Karl Marx, and others.

ECON 104. The Evolution of Economic Ideas and Systems. .25 Credits.
Offered Fall, Spring, Summer; Lecture hours:1
This course covers how economic ideas evolved alongside changes in economic systems. Topics include the economic thought of Smith, Marx, Veblen, Keynes and Hayek, and economic systems such as ancient communism, empires, feudalism, mercantilism and various forms of capitalism. Students read and write independently on the topic.

ECON 127. International Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of international economic relations today and of the theory used to analyze trade and financial relations. Attention is given to the problems of government policy with respect to international issues.

ECON 198. Independent Study. .25-1 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:3; Repeatable
Independent Study - Individual product or project supervised by a member of the economics department.

ECON 202. Intermediate Microeconomics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Intermediate Microeconomic theory of the consumer, the firm, market structures, and resource allocation. Topics are introduced using differential calculus. Prerequisites: ECON 101 and (MATH 192 or MATH 201).

ECON 203. Intermediate Macroeconomics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The study of national income, employment, inflation, interest rates, and the impact of monetary and fiscal policy on the economy. Prerequisite: ECON 101 and (MATH 192 or MATH 201).

ECON 204. Intermediate Political Economy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Intermediate study of Marxist and institutionalist political economy. The ideas of Marx and Veblen applied to such matters as the distribution of income and power, the environment, working conditions, consumerism, and race and gender issues. Prerequisite: ECON 101.

ECON 209. Economic Geography. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Inquiry into local and global changes in economic activity, location and spatial organization, especially focusing on implications for the well-being of people in particular places. Crosslisted as GEOG 209.

ECON 210. Introduction to Behavioral Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to the field of economics focused on incorporating psychological insights into models of decision making and group interaction. This course provides students with an overview of an assortment of research topics and methods within the field of behavioral economics. Seniors require permission of the instructor.

ECON 215. Economics of Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course integrates the study of economics with education by employing economic principles, frameworks and analytical tools, to analyze and assess the various factors influencing educational decision-making, policies, resource allocation and outcomes. At its core, this course explores the fundamental question: What role does education play within the economy?.

ECON 217. Geographies of Uneven Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course, we will build a critical understanding of the nature and processes of development in the global south countries while exploring the role of colonialism, imperialism and capitalism. Includes topics such as global political-economic change, population growth, human capital, microfinance, food politics and gender inequality. Crosslisted as GEOG 227.

ECON 220. Political Economy of Neoliberalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course interrogates our current economic period: Neoliberalism. We analyze power differentials and economic disparities created by neoliberalism. Specific attention is paid to the shifting role of government in the economy, mass incarceration, and the 2008 financial crisis. Prerequisite: ECON 101. First- and second-year students only; others by permission.

ECON 222. Economic Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected issues in economic theory or policy. Prerequisite: ECON 101.

ECON 224. African Women & Social Action. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of topics in films and novels by Ousmane Sembene: pre-colonial history, colonialism, post-colonial independence, racial and gender oppression, worker exploitation, religious conflict, and modernization. Prerequisites: ECON 101 or permission of the instructor. Crosslisted as WMST 224.

ECON 226. Political Economy of the European Integration. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to core issues and theories related to the economic and political processes of European integration. Offered through Bucknell in London. Crosslisted as POLS 221.

ECON 231. Economics of Climate Change. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course reviews climate science and the sources and expected impacts of climate change. Domestic and international climate policy instruments are evaluated with special attention given to the effects of climate policy on economic development and equity. Prerequisite: ECON 101.

ECON 235. African Economic Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A historical, institutional analysis of Sub-Saharan African economic, social, and political development. Primary emphasis will be on the analysis of the economic crisis facing the subcontinent since the late '70s and the structural adjustment programs that have been instituted to deal with the crisis. Prerequisite: ECON 101.

ECON 237. Health Politics and Health Policy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
History of health care delivery and financing in the United States and introduction to and evaluation of current topics in health policy. Prerequisite: ECON 101 or permission of the instructor. First- or second-year standing, others by permission.

ECON 241. Econometrics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The application of statistical methods to quantify and test economic theories, analyze government policies, and forecast economic variables. Prerequisites: ECON 101 and (MATH 216 or MATH 227 or PSYC 215) and (MATH 192 or MATH 201).

ECON 243. Global Communities. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the complexities of globalization, analyzing its benefits, challenges and diverse impacts. The course hones critical thinking, reading, writing and communication skills while addressing global political, economic, cultural and environmental issues. Students will engage with multiple perspectives to become informed participants in global discussions and problem-solving. Crosslisted as SOCI 343.

ECON 246. American Capitalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the origins and development of capitalism in the United States. Property rights, how notions of time and space changed markets, prolitarianization, alienation, commodification, and the role the government played (or not) in shaping the economy are some of the topics that we will cover. Crosslisted as HIST 226.

ECON 260. Understanding Capitalism. 1 Credit.
Offered Occasionally; Lecture hours:3
The course exposes students to an analysis of how capitalism works via the work of two of its greatest analysts: Karl Marx and John Maynard Keynes. It analyzes the production, distribution, exchange and consumption of material wealth under the laws of capitalism.

ECON 270. South Africa: Social Entrepreneurship. 1 Credit.
Offered Summer Session Only; Lecture hours:15
The course examines the legacy of apartheid and the role of social entrepreneurship in transforming communities. Students are placed in community organizations in nearby townships. Prerequisite: permission of the instructor. Crosslisted as UNIV 284.

ECON 273. Latin American Economic Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course deals with historic and contemporary economic problems, starting from colonial times and reaching the present integration into world economy. Crosslisted as IREL 278 and LAMS 273.

ECON 280. Political Economy of Media and Advertising. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines the interrelationship of cultural, political, and economic aspects of media content and advertising from the perspective of Institutional and Marxian political economy. Prerequisite: ECON 101 or permission of the instructor.

ECON 281. Understanding the Global Economy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:1
This course develops a political economy framework to analyze the global economy. It covers theories of international trade, international finance, economic development, and technological change. The course applies the theoretical tools to assess how globalization influences performance, strategy, and policies within nations and firms, and across industries.

ECON 282. Introduction to Programming for Economics. 1 Credit.
Offered Occasionally; Lecture hours:3
Students are introduced to Python programming and some of its applications in economics and finance. Students develop the necessary skills to bring datasets to Python and answer interesting questions. The course covers the basics of preparing various data types, data visualization, and solving problems. No programming background is needed.

ECON 298. Independent Study. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Individual product or project supervised by a member of the economics department typically resulting in the production of a long research paper. Prerequisites: ECON 101 and permission of the instructor.

ECON 299. Teaching Assistants in Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course can only be taken by economic majors who have permission and have taken the prerequisites. Prerequisites: ECON 202 and ECON 203 and ECON 204 and permission of the instructor.

ECON 2NT. Economics Non-traditional Study. .25-1 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:Varies; Repeatable
Non-traditional study in economics. Prerequisite: permission of the department chair or the instructor.

ECON 304. Financial Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course is focused on theory of finance and asset pricing. Topics include state pricing theory, capital asset pricing model, portfolio theory and risk aversion. Prerequisites: ECON 202 and (MATH 216 or MATH 227 or PSYC 215).

ECON 308. Economics of Innovation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to the important issues related to technological change and innovation – how new technologies impact the economy and our society. The lectures also focus on economic and social policies aimed at promoting growth and development.

ECON 311. Labor Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of economic models related to labor markets, current labor market trends, and the influence of related government policies. Prerequisites: ECON 202 and (MATH 216 or MATH 227 or MATH 304 or PSYC 215).

ECON 313. Public Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An analysis of the government's role in the economy. Topics include the economic rationale for government, expenditure analysis, and the allocative and distributive consequences of taxation. It is strongly recommended that students have one semester of statistics. Prerequisite: ECON 202.

ECON 319. Economic History of Women in the United States. 1 Credit.
Offered Occasionally; Lecture hours:3
An examination of economic models related to labor markets, current labor market trends, and the influence of related government policies. Prerequisite: ECON 202 or ECON 203 or ECON 204. Crosslisted as WMST 318.

ECON 321. Social Theory: Deconstructing Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore how we can understand power in the economy by studying different social theoretical approaches to power. Following a survey of theories of power, we will begin to apply these theories in economic contexts to understand how power hierarchies are created, sustained, maintained and changed.

ECON 326. History of Economic Thought. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Discussion of original sources of economic ideas. Readings about Quesnay, Smith, Ricardo, Marx, Marshall, Keynes, Hayek and others. Prerequisite: ECON 203 with a minimum grade of D and ECON 204 with a minimum grade of D.

ECON 328. Money and Financial Institutions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
An analysis of the role of the financial system in the U.S. economy. Topics include determinants of asset prices, risk management, and financial regulations. Prerequisites: ECON 203 and (MATH 216 or MATH 227).

ECON 330. Law and Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines several areas of law from the "Law and Economics" perspective and analyzes the assumptions that underlie this approach to law. Property rights law, contract law, and tort law will be covered. Prerequisite: ECON 202.

ECON 333. Seminar in Economic Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Guided discussion of economic issues. Topics to be announced at time of preregistration. Prerequisites: ECON 202 and ECON 203 and ECON 204 or permission of the instructor.

ECON 337. International Monetary and Financial Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course covers balance of payments, foreign exchange markets, international monetary systems, the adjustment mechanism, macroeconomic policy in an open economy and monetary integration. Prerequisite: ECON 203 or permission of the instructor.

ECON 339. China & East Asian Economics. 1 Credit.
Lecture hours:3
An analysis of economic transition and development in China, with emphasis on its role in the Asia-Pacific and world economies. Prerequisites: ECON 202 and ECON 203 or permission of the instructor. Crosslisted as EAST 339.

ECON 342. Methods in Experimental Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides students with an introduction to methods used in conducting experimental economics research. The course explores different types of experiments (survey/lab/or field) used in economic research, experimental design and select research topics. Prerequisites: (ECON 202 or ECON 210) and (MATH 216 or MATH 227 or ANOP 102 or PSYC 215).

ECON 350. Classical Marxism. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
The goal is to develop an understanding of Marx's analysis of capitalism by reading mainly original texts by Marx and consider its applications both to disciplinary thinking and contemporary events. Crosslisted as GEOG 350.

ECON 353. Gender & Migration. 1 Credit.
Lecture hours:3
This course focuses on the role of gender in internal and international migrations. It covers gendered motivations for and patterns of migration; the global economy and migration, migration and families, forced migration, migration and economic restructuring, and transnational marriage and identity. Prerequisites ECON 203 or ECON 204 or WMST 150. Crosslisted as WMST 353.

ECON 357. Economic Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The main theories of development; economic and social dualism; agricultural, industrial, and trade strategies; and the role of less developed countries in the emerging global economy. Prerequisites: ECON 202 with a minimum grade of D and ECON 203 with a minimum grade of D and permission of the instructor.

ECON 358. Marxian Economics. 1 Credit.
Lecture hours:3
Applies Marxian value theory and class analysis to understand contemporary U.S. capitalism. Explains how prices are determined and how competition acts to distribute value, revolutionize technology and working conditions, and trigger economic crises. Explores gender and class in the enterprise and household and examines economic democracy as a viable alternative.

ECON 360. Political Economy of Advanced Capitalism: Economic Crises & Conflict. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will focus on the structure and the dynamics of the advanced capitalist economies, including the United States. Among other topics, it will examine the empirical evidence and the theoretical claims of the political economy approach concerning economic and financial crises.

ECON 365. Global Value Chains: How the Modern World Economy Works. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course provides an in-depth analysis of how our modern world capitalist economy organizes the politics and economics of contemporary supply chains by slicing up the financing, production, distribution, exchange, and consumption of the goods and services that we consume across the world.

ECON 398. Independent Study. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual study or project, supervised by instructor. Prerequisites: ECON 202 or ECON 203 or ECON 204 and permission of the instructor.

ECON 402. Economics of Inequality. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
A critical analysis of economic inequality focused on competing frameworks for inequality and proposed visions for what should be done. Topics include class conflict, race and ethnicity, gender, wealth, labor markets and social change. Prerequisites: ECON 202 and ECON 204.

ECON 405. Comparative Economic Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A comparison of the cultures and institutions of modern economic systems. The characteristics of selected capitalist, social democratic and socialist economies are assessed from mainstream, Institutionalist and Marxian analytical perspectives. Prerequisite: ECON 204 or permission of the instructor.

ECON 408. Seminar in Political Economy: The State and The Economy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course analyzes the role of The State in the economy. We will explore alternative theoretical understandings of the role of the state. Following this, we will investigate the role the state is playing in the economy today. Is it the source of problems or the solution to current issues?.

ECON 410. Risk Management in Financial Markets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course is focused on the applications of finance theory in asset pricing and risk management. The topical coverage will extend to fixed income, equity securities, options, derivatives, risk analysis, and hedging strategies. Prerequisite: ECON 202 or permission of the instructor.

ECON 412. Health Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Theoretical and empirical examinations of issues in health economics. Course includes semester-long research project on a health topic. Prerequisites: ECON 202 and (MATH 216 or MATH 227 or MATH 304).

ECON 418. American Economic History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of the development and influence of American economic institutions from colonial to current times. Prerequisites: ECON 203 and ECON 204.

ECON 422. Experimental Economic Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Experimental economics uses researcher-controlled methods to investigate individual and group decision-making. In this course, students will critically analyze existing experimental economic research through discussion, reading and writing. Students will also learn best practices in experimental economic research through a semester-long research project.

ECON 426. Topics in the History of Economic Thought. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Discussion of the relation between economic ideas and policy in the United States. Readings about Hamilton, Carey, Ely, Commons, Clark, Eccles, Okun, and others. Prerequisite: ECON 203.

ECON 427. International Economic Theory. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Theoretical principles underlying international trade, investment, commercial policy, economic integration, adjustment mechanisms, and balance of payments policy will be examined with an application to current national/international policies. This course isn't open to students that have taken ECON 327. Prerequisites: ECON 203 and ECON 203.

ECON 429. Political Economy of Financial Crises. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore the causes and consequences of financial crises from macroeconomic perspectives, with most of the attention given to the recent financial crisis in the United States. Prerequisite: ECON 204 or permission of the instructor.

ECON 441. Econometric Research. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Advanced panel data methods, instrumental variables and two stage least squares, simultaneous equations, limited dependent variables, sample selection bias, advanced time series, and writing and presenting an empirical research project. Prerequisites: (ECON 202 or ECON 203 or ECON 204) and (ECON 241 or ECON 341).

ECON 444. Senior Seminar in Economic Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Topics to be announced at the time of preregistration. Prerequisites: ECON 202 and ECON 203 and ECON 204.

ECON 450. Political Economy of Digital Capitalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
The course examines recent theoretical and empirical debates pertaining to the political economy of digital economic processes and their impact, in turn, on domestic and global development. Prerequisite: ECON 204 or permission of the instructor.

ECON 499. Honors Thesis in Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Individual research, leading to an honors thesis in economics, undertaken by qualified students, and supervised by an instructor in the department of economics. Prerequisite: permission of instructor and Honors Council. Prerequisite: ECON 202 or ECON 203 or ECON 204.

Education

Faculty

Professors: Abe N. Feuerstein (Chair), Amy Golightly, Sue Ellen Henry, Sarah K. MacKenzie-Dawson

Associate Professors: Lori A. Dira, Ramona Fruja, Allison J. Lockard, Robert M. Midkiff Jr., Joseph L. Murray

Assistant Professors: Grace Jue Yeon Kim, Janet VanLone

Education at Bucknell empowers students to be critical thinkers and creative intellectual leaders in education and human services-related fields. Including both disciplinary knowledge and professional preparation, our programs allow students to explore issues of equity and justice rooted in the historical, philosophical, sociological and psychological dimensions of education as they inform teaching and learning practices. Coursework in education thus provides students with opportunities to shape and contribute to the common good as they learn about the diverse social contexts of education. Such experiences foster the personal development of our students as well as those with whom they will ultimately work.

The following values inform our work with undergraduate students:

Merging Liberal Arts and Professional Experiences
We believe that combining deep knowledge with application enhances the education of our undergraduate students by developing their depth of understanding, resourcefulness, imagination and interpersonal skills, enabling them to become effective leaders and educators in a wide variety of civic and organizational settings.

Cultivating Critical Thinking and Equity-Orientation
Our aim is to help students develop professional dispositions in critical thinking, ethics and leadership so that they will be able to help others maximize their opportunities for success in inclusive educational environments. Through our work together, we engage intellect, affect and action, inviting students to consider how to best understand and engage with issues of inequality in education and other social institutions.

Fostering Engaged Learning and Applied Knowledge
Our programs are designed to enhance students' ability to apply their understanding of the social dynamics of education, theories of human development, learning, instruction and behavior to many professional contexts. Well-embedded in the curricular commitments of the University and reflective of the diversity of faculty expertise within the department, we facilitate our students' engagement in a variety of high-impact educational practices, including writing-intensive courses, undergraduate research, ePortfolios, service and community-based learning, and internships, including student teaching.

Preparing Students for Reflective Action in Diverse Settings
Coursework in education is intended to prepare students to contribute to the improvement and effectiveness of education in their roles as professionals, leaders, citizens and parents. This broad conceptualization of education is thought to enhance the liberal education of all students while also holistically preparing those interested in teaching in public or private schools. In addition to teaching, graduates from our programs enter careers in government, non-profit organizations and industry. Others go on to graduate or professional programs in education or allied fields (e.g., special education, school counseling, school psychology, social work, college student personnel, curriculum and instruction, educational research, educational leadership and administration) as well as other fields, such as law, medicine, psychology and sociology.

Majors

The department offers the Bachelor of Arts (BA) and Bachelor of Science in Education (BSED). A major in education within either degree program can prepare students to pursue careers in teaching. It also provides the necessary background and preparation for graduate work in various disciplines, and for careers in law, business and public service. Students interested in secondary or K-12 certification seek a degree in the discipline they wish to teach and may either pursue certification only or a dual major in education and the discipline.

The BA degree with a major in education is designed for students who are interested in studying the process and structure of education and schooling but who are not necessarily interested in pursuing a career in teaching. Students who want to obtain certification in early childhood education should pursue the BSED degree. Students interested in secondary certification should pursue a degree in the discipline they wish to teach.

Bachelor of Arts in Education

The field of education is best understood as an interdisciplinary social science that integrates multiple perspectives on human learning and development, processes that occur across a wide variety of contexts. The Bachelor of Arts in Education is designed for students who are interested in studying education as an academic field – the process and structure of education in both traditional schooling situations as well as other educational arenas of public life – but who are not necessarily interested in a career in public school teaching. Central to the bachelor of arts is the examination of the relationship between educational institutions (broadly conceived) and society, as well as deep exploration of the nature of learning and learners. The program is designed to prepare students to make original contributions to knowledge in the field through research and creative applications of theory.

The Bachelor of Arts in Education requires eight courses that fall into two categories. First, all students must complete a core set of four requirements:

EDUC 101	Diversity, Equity and the Foundations of American Education	1
EDUC 102	Educational Psychology	1
EDUC 362	Quantitative Research Methods	1
or EDUC 364	Qualitative Research Methods	
EDUC 425	Internship in Education	1

Second, all students must complete four additional courses in one of the following concentrations. Electives, where specified, may be taken abroad in consultation with the student's adviser. Students develop competency in speaking, writing and information literacy through the completion of small group and individual presentations and research projects within core and concentration courses. To fulfill their Culminating Experience requirement, students either complete an internship experience (EDUC 425 Internship in Education) in which they document their work via an electronic portfolio, or pursue an honors thesis (EDUC 415 Honors Thesis in Education).

Growth, Change & Learning

This concentration is designed for students who have an interest in fostering the academic, emotional and behavioral development of children and adolescents. Emphasis is on theoretical knowledge and practical applications of this knowledge, including implications for teaching and learning, taking into account cognitive, psychosocial and physical changes that occur over time. Students also gain exposure to a variety of theoretical orientations related to learning, including cognitive, behavioral, social, constructivist and humanistic perspectives. Graduates with this concentration may be interested in working within educational organizations, behavioral health or correctional facilities, and various social service agencies. This concentration also prepares students to enter graduate school in fields such as teaching, school psychology, applied behavior analysis and school counseling. The Growth, Change & Learning concentration requires:

One of the following:		
EDUC 323	Education of Young Children	1
EDUC 335	Child & Adolescent Development	1
Two of the following:		
EDUC 312	Counseling Techniques	1
EDUC 321	Disability Studies	1
EDUC 331	Trauma and Healing	1
Elective (selected in consultation with the student's adviser)		1

Educational Policy & Social Change

This concentration is designed for students who are interested in studying the foundations of public education and the political environment within which schools operate. This study is both historically and sociologically grounded, with significant attention to identity development, the various ways in which students interact with educational institutions and current developments in educational policy. This concentration aims to prepare students to engage in educational policy analysis and to think critically about educational change. Those pursuing this concentration may be interested in graduate school in social foundations of education, educational policy, or a related subject area, or may be interested in entering work environments that focus on children's issues, educational inequality and educational reform. The Educational Policy & Social Change concentration requires:

One of the following:		
EDUC 227	Immigrant Youth in U.S. Society	1
EDUC 290	Gender Issues in Education	1
EDUC 318	Multiculturalism and Education	1
Two of the following:		
EDUC 232	Remaking Public Education	1
EDUC 308	Advanced Educational Foundations: Democracy and Education	1
EDUC 350	Higher Education in the United States	1
Elective (selected in consultation with the student's adviser)		1

Bachelor of Science in Education

The Bachelor of Science with a major in early childhood education (Pre-K to grade 4) is designed for students who have clearly defined professional interests in the field of education and who desire to pursue a career in early childhood education with certification in grades pre-K-4. The degree requires:

EDUC 101	Diversity, Equity and the Foundations of American Education	1
EDUC 102	Educational Psychology	1
EDUC 235	The Creative Process	1
EDUC 306	Classroom and Behavioral Management	1

EDUC 311	Assessment and Differentiation	1
EDUC 313	Reading Self, Community, and The World	1
EDUC 321	Disability Studies	1
EDUC 323	Education of Young Children	1
EDUC 324	Explicit Instruction	1
EDUC 341	Early Literacy	1
EDUC 344	Science as Inquiry	1
EDUC 347	Family, School, and Community Partnerships	1
EDUC 349	Student Teaching: Elementary	3
EDUC 375	ESL Methods: Instruction and Assessment	1
EDUC 449	Professional Seminar in Elementary Education	1

Students develop competency in speaking, writing and information literacy through small group and individual presentations, research projects, debates, and the creation and presentation of unit and lesson plans within required courses. Candidates' Culminating Experience, the 12-week student teaching semester (EDUC 349 Student Teaching: Elementary and EDUC 449 Professional Seminar in Elementary Education), includes extensive unit research and lesson planning, implementation and presentation, along with the completion of written assignments pertinent to their experience. In addition, students develop and present electronic program portfolios, further demonstrating their technological expertise.

Additional Certification Requirements

Students seeking certification in early childhood education (Pre-K to grade 4) are also required to take the following courses:

MATH 203	Introduction to Mathematical Thought	1
MATH 204	Elementary Geometry and Statistics	1
Additional requirements [1]		

[1] Other certification requirements are listed on the education department website (bucknell.edu/education (http://www.bucknell.edu/education/)). Requirements may change as mandated by the legislature of the Commonwealth of Pennsylvania.

First Year

First Semester	Credits	Second Semester	Credits
EDUC 101	1	EDUC 102	1
EDUC 235	1		
	2		**1**

Sophomore

First Semester	Credits	Second Semester	Credits
MATH 203	1	EDUC 321	1
EDUC 323	1	EDUC 344	1
EDUC 341	1	EDUC 347	1
	3		**3**

Junior

First Semester	Credits	Second Semester	Credits
Abroad, if desired. We encourage our students to take advantage of this opportunity. This is also an opportunity to take ESL courses for those pursuing additional certification.		MATH 204	1
		EDUC 311	1
		EDUC 313	1
		EDUC 324	1
	0		**4**

Senior

First Semester	Credits	Second Semester	Credits
EDUC 349	3	EDUC 306	1

EDUC 449	1 EDUC 375	1
	4	**2**

Total Credits: 19

Secondary Education and Teaching Certification

The following list shows the secondary and K-12 certifications offered by the department. Students seeking these certifications also must complete the requirements for the Bachelor of Science or Bachelor of Arts in the discipline listed after the certification area.

Certification Area – Required Major

- Art (K-12) – Art
- Biology (7-12) – Biology
- Chemistry (7-12) - Chemistry
- English (7-12) – English
- French (K-12)
- Spanish (K-12)
- Mathematics (7-12) – Mathematics
- Music (K-12) – Music
- Physics (7-12) – Physics
- Social Studies (7-12) – Anthropology, Economics, Geography, History, Political Science, Psychology or Sociology

Required education courses for secondary and K-12 teaching certification include:

EDUC 101	Diversity, Equity and the Foundations of American Education	1
EDUC 102	Educational Psychology	1
EDUC 306	Classroom and Behavioral Management	1
EDUC 311	Assessment and Differentiation	1
EDUC 335	Child & Adolescent Development	1
EDUC 375	ESL Methods: Instruction and Assessment	1
Methods course in content area		1
EDUC 340	K-12/7-12 Field Experience	.5
EDUC 359 & EDUC 459	Student Teaching: Secondary and Professional Seminar in Secondary Education [5]	4

[5] Courses are included in semester of student teaching requirement. Courses can be taken only if the student demonstrates that all requirements leading to a recommendation for certification have been or soon will be completed. Students who cannot or choose not to take courses should complete the B.A. or B.S. in the content area or consult with the chair of the education department to select appropriate courses to complete a B.A. in education.

Specific requirements may change as mandated by the legislature of the Commonwealth of Pennsylvania. Lists of courses acceptable for meeting specific requirements are available at the education departmental office or website (bucknell.edu/education (http://www.bucknell.edu/education/)).

ESL Program Specialist

Students completing any of Bucknell's teacher certification programs can obtain an additional certification as an ESL Program Specialist. A list of required courses can be found on the department website (bucknell.edu/education (http://www.bucknell.edu/education/)). Field experience is required for this additional certification.

General Requirements for Teaching Certification

The department of education provides teacher preparation programs which lead to certification in the Commonwealth of Pennsylvania in early childhood education, and selected content areas in secondary education. Students can prepare to become certified teachers by enrolling in a Bachelor of Science in education degree program or by taking a Bachelor of Arts or Bachelor of Science degree in the content area in which they plan to teach. Independent of the degree program into which a student is admitted to the University or the area in which a student may wish to teach, a student also must be formally admitted to the Pre-Certification, Initial Preparation Program (Pre-CIP). Admission to Pre-CIP can occur after the student has completed two courses in mathematics[6], one course in British or American literature and one in composition[6], 16 Bucknell University courses or their equivalent, and achieved for the three preceding semesters an overall grade point average of 3.0 (appeals to this requirement should be made to the chair of the department of education). Application to Pre-CIP is normally made when the students begin considering a career in the field of education. Students are notified of their acceptance or rejection in the teacher preparation program at the end of their sophomore year.

The Commonwealth of Pennsylvania generally requires an overall grade point average of 3.0 upon completion of the program prior to recommendation for certification to teach. Specific requirements leading to a recommendation in each teaching area are available at the education department website (bucknell.edu/education (http://www.bucknell.edu/education/)). It is the responsibility of the student to examine these programs in consultation with a member of the education department. Although members of the department will advise students concerning course selection, the student is responsible for choosing those courses and experiences that meet certification program requirements.

In addition to completing an approved program and successfully demonstrating the prescribed role competencies, the prospective teacher must be a "person of good moral character" who "possesses those personal qualities and professional knowledge and skills which warrant issuance of the requested certificate." It is the student's responsibility to satisfy these criteria. Students should note that prior to placement in student teaching or any other field experience, they will be required to submit results of a child abuse clearance, criminal background check and fingerprinting pursuant to requirements of the Pennsylvania Department of Education. Results must indicate that there are no criminal or child abuse records.

In addition to coursework, students applying for a teaching certificate must complete and submit scores from required tests to the department of education at Bucknell. Specific examinations required for each area of certification vary. Although members of the department will advise students concerning examinations, the student is responsible for taking those examinations that meet certification program requirements.

After completing the approved program of courses, the student submits an application for a Pennsylvania teaching certificate through the online Teacher Information Management System (TIMS) not earlier than the first day of the month of graduation. Following a review of the student's program, the student may be recommended for certification by the designated officer at Bucknell. As noted above, the student must pass all the competency tests required by the Commonwealth of Pennsylvania for the desired certificate.

Students who desire certification in states other than Pennsylvania must understand that teacher certification is governed by state law and that each state has different requirements. Obtaining a Pennsylvania teaching certificate, by completing an approved program and meeting all other requirements, does not ensure that students will be certified in another state. Although members of the Bucknell education department will assist students in obtaining information concerning certification in other states, as well as Pennsylvania, it is the student's responsibility to obtain current information and to meet all the certification requirements of any state.

[6] Exceptions to these requirements will be posted on the education department website (bucknell.edu/education (http://www.bucknell.edu/education/)).

Student Teaching

The education department is responsible for the professional preparation of future teachers. To ensure that future professionals are competent, the privilege of taking the course in student teaching is restricted to students whose cumulative grade point average through the junior year is 3.0 or better.

Student Teaching Courses

Select one of the following:

EDUC 349 & EDUC 449	Student Teaching: Elementary and Professional Seminar in Elementary Education
EDUC 359 & EDUC 459	Student Teaching: Secondary and Professional Seminar in Secondary Education

Additional requirements for all student teachers are good health, character, personality, and acceptable spoken and written English. Placement in student teaching is contingent upon acceptance of the student by a cooperating teacher in an elementary or secondary school that has been approved by the Bucknell education department. Students are responsible for obtaining transportation to their placement.

All students who are interested in student teaching must apply to the Pre-CIP program no later than the first semester of the junior year.

Minor in Education

The **minor** in education consists of five courses chosen from among the department offerings. The student must take either EDUC 101 Diversity, Equity and the Foundations of American Education or EDUC 102 Educational Psychology as one of the five courses. The additional four courses may include any of the departmental offerings and can be grouped into areas of specialization such as growth, change and learning, or educational policy and social change. If a student has taken both EDUC 101 and EDUC 102, only three additional courses are required to complete the minor.

Education Departmental Goals

Informed by a Liberal Arts perspective, students will:

1. Analyze educational policy and practice. Develop reasoning processes to connect theory and practice.
2. Engage in professional and ethical interactions with others.
3. Apply theory, question and research to promote learning and healthy development for all children and adolescents.

4. Perceive themselves as lifelong learners and potential leaders who are informed advocates for children and adolescents in diverse community and educational settings.
5. Use ongoing self-reflection to explore one's personal and professional identity in relation to educational issues.

Students in Teaching Certification Programs (B.S. Early Childhood Education, Pre-K-4, and Secondary Certification Programs) will be able to:

1. Develop curricula that are developmentally appropriate, relevant, and based on an understanding of student development and student learning. (3, 4, 7)
2. Attend to the social and civic development of their students. (5)
3. Use both content knowledge and pedagogical knowledge to inform their teaching (i.e. students must be well versed in the content they intend to teach and be able to critically evaluate and apply theories of effective practice). (1,2,6)
4. Work respectfully and collaboratively with their colleagues and their community to ensure the quality of educational programs. (5, 7)
5. Use assessment of their student's learning and their own teaching to inform future planning and teaching. (4, 6)
6. Be aware of the various forms of diversity embodied by learners in their classrooms and modify curriculum and instruction based on the individual needs of their students. (2, 3)

Majors in the B.A. Program will be able to:

1. Describe the process and structure of educational organizations. (3, 6)
2. Understand how humans learn and develop. (1, 4, 5)
3. Understand the core concepts and tools of inquiry for evaluating and producing educational research. (2)
4. Understand diverse applications of educational theory. (1, 2, 3, 4, 5, 6, 7)
5. Demonstrate capacity for self-reflection and ethical reasoning. (7)
6. Understand the importance of equity and social justice in education.

Numbers in parentheses reflect the related Educational Goals of Bucknell University.

Courses

EDUC 101. Diversity, Equity and the Foundations of American Education. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Historical, economic, philosophical, and social foundations of education, and their implications for present-day education in America. Emphasizes issues of diversity and equity. Provides a background of information for the prospective teacher and citizen. Not open to seniors.

EDUC 102. Educational Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Role of psychological concepts in educational practices. Nature, sources of individual differences in development and readiness. Learning theory, motivation, and emotion in learning. Issues in identifying and supporting the learning of all students. Measurement and evaluation of learning.

EDUC 1NT. Education Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in education.

EDUC 227. Immigrant Youth in U.S. Society. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the varied trajectories in contemporary immigrant youth adaptations across social contexts, including schools, families, peer groups and work. Crosslisted as EDUC 627.

EDUC 230. Foundations of Classroom Assessment. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Use of observation, documentation, and assessment to develop instructional practices that support learning of all children. Includes assessment across environments and for different purposes. Prerequisite: EDUC 102 or EDUC 201 or permission of the instructor.

EDUC 232. Remaking Public Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines the way advocates, entrepreneurs, and philanthropists are changing public education (and society) through innovations like charter schools, school vouchers, cyber schools and home schooling.

EDUC 235. The Creative Process. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course approaches creativity as a process that transforms our understanding of the world. It will examine the role the arts (visual, written, musical, theatre, and dance) can play in creating meaningful opportunities for students to engage, express, and learn within the context of the classroom and beyond. Fieldwork/Clearances required.

EDUC 265. Children's Literature and Pedagogy. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course encourages the exploration of children's literature. We will discuss theoretical and pedagogical approaches for integrating children's literature. Students will have an opportunity to develop engaging unit and lesson plans that promote academic growth, social-emotional learning, and deepen children's appreciation of history, society, and diverse cultures.

EDUC 275. Linguistic Diversity and Equity in Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores linguistic diversity and how it shapes teaching and learning in US schools. This course is designed to develop critical language awareness by examining language ideologies. We will discuss ways to recognize the linguistic resources and experiences of diverse students and identify pedagogical strategies that promote educational equity.

EDUC 290. Gender Issues in Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of how gender affects the teaching-learning process with an emphasis on theory, curriculum, pedagogy, and assessment. Crosslisted as WMST 290.

EDUC 2NT. Education Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in education. Prerequisite: permission of the instructor.

EDUC 306. Classroom and Behavioral Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will focus on positive, preventative, research-based classroom and behavior management strategies. Grounded in behavioral theory, students will understand specific systems and practices that provide universal support to all children and adolescents as well as more intensive supports when needed.

EDUC 308. Advanced Educational Foundations: Democracy and Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course employs a multidisciplinary approach to explore the relationship between education and democracy in "free" societies such as the United States. Students will critically examine the American educational system and its contemporary problems through the lenses of history, philosophy, sociology, and anthropology. Prerequisites: EDUC 101.

EDUC 311. Assessment and Differentiation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Focuses on instructional approaches that emphasize teaching diverse learners in the academic, social and behavior domains. Students will learn a process for differentiating instruction based on individual student needs. Students will be introduced to the concepts and application of assessment. Prerequisite: EDUC 102 or EDUC 201. Fieldwork and Clearances Required.

EDUC 312. Counseling Techniques. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:4
This course provides an introduction to counseling theory and basic micro-skills of counseling. Students will practice basic techniques of therapeutic interviewing.

EDUC 313. Reading Self, Community, and The World. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course explores children's literature in relation to the teaching of social studies. Pre-service teachers will engage with both social studies and literacy standards as they plan, implement, reflect and revise literature based social studies lessons. Fieldwork and clearances required. Not open to students who have taken EDUC 343/643.

EDUC 317. Problems in Education. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Research on a problem not involved in a student thesis. Upperclass students. Prerequisite: permission of the instructor. Crosslisted as EDUC 617.

EDUC 318. Critical Multiculturalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course combines social science and educational research with narrative accounts to explore the historical, philosophical, sociological, and political foundations of the multicultural movement in American education. The course will examine and critique contemporary issues such as the educational experiences of minority groups, inclusive pedagogy, and bilingual education.

EDUC 319. Group Processes. 1 Credit.
Lecture hours:3
This course presents basic dynamics, theoretical components, and developmental aspects of group processes with clients. Students will participate in a group exercises as members and leaders.

EDUC 320. Ethics in Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Application of traditional and contemporary ethical theories to current dilemmas in teaching, research, counseling, administration, and educational policy.

EDUC 321. Disability Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An overview of legislation and procedural safeguards which govern access for people with disabilities in the United States, and implications of various exceptionalities for educational attainment. Through literature and media, students will come to understand people with disabilities as far more than the cumulation of their limitations.

EDUC 323. Education of Young Children. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:3
A conceptual-development overview of the social, emotional, cognitive, and physical characteristics of the early childhood years (to age 9) stressing extrapolation from developmental theory to educational practice for teachers and parents who function as the earliest educators. Fieldwork and clearances required. Prerequisites: (EDUC 101 and EDUC 102) or EDUC 201.

EDUC 324. Explicit Instruction. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will focus on the elements of explicit instruction, which is a structured and systematic approach for teaching academic skills. Students will learn how to design lessons for teaching specific skills, how to organize and deliver instruction, and how to provide appropriate independent practice and feedback. Fieldwork/clearances required.

EDUC 331. Trauma and Healing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Trauma affects how people interact, learn and develop; it also affects disease processes and life expectancy. This course examines the importance of compassion by cultivating an understanding of behavioral and socio-affective implications of risk and trauma, toward the end of fostering resiliency in ourselves and those we care for.

EDUC 335. Child & Adolescent Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Using textbooks, films, media and popular children's and young adult literature, this course examines all aspects of development of school-age students in grades K-12. EDUC 102 or EDUC 201 is recommended for students taking this course.

EDUC 338. Bucknell in Italy: Childhood, Family & Education in Italy. 1 Credit.
Offered Summer Session Only; Lecture hours:3
In this 1-credit, 4-week study abroad experience you will learn about childhood in Italy with an emphasis on the family and education systems in Italy. Not open to seniors. Crosslisted as PSYC 338.

EDUC 340. K-12/7-12 Field Experience. .5 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3
This pre-student field experience will provide students with direct classroom experience. Students will develop instructional strategies and classroom management skills. Students will be placed in classrooms in local school districts.

EDUC 341. Early Literacy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
A study of the strategies and techniques involved in teaching children to read and to write (Pre-K-4 level). Contemporary theories of reading behavior. Fieldwork and clearances required. Prerequisites: EDUC 101 and EDUC 102 or EDUC 201.

EDUC 344. Science as Inquiry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:4
This course reflects best practices for the teaching of science as inquiry. Focuses on methods and materials for teaching science concepts, processes, and skills to young children. Fieldwork and clearances required. Prerequisites: EDUC 101 and EDUC 102 or EDUC 201.

EDUC 347. Family, School, and Community Partnerships. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Students will explore important factors and effective strategies in creating and sustaining respectful, reciprocal, supportive and empowering relationships with families to enhance children's development and learning. Prerequisite: junior or senior status or permission of the instructor. Field experience and clearances are required.

EDUC 349. Student Teaching: Elementary. 3 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Other:35
Supervised practice in the design and implementation of instruction in elementary school classrooms. Emphasis on professional conduct and use of theory to inform practice. Students must be accepted into the Pre-CIP program, must have enrolled in all certification courses or obtain permission of the instructor. Corequisite: EDUC 449.

EDUC 350. Higher Education in the United States. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Overview of historical and contemporary trends in post-secondary education: systematic examination of selected social, political, economic, and educational forces and problems affecting contemporary higher education.

EDUC 351. Learning and Development in Postsecondary Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Investigation of contemporary theories pertaining to the processes of learning and development that occur from later adolescence through old age.

EDUC 355. Teaching of Science in Secondary School. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:4
Principles and practices of teaching biology, chemistry, physics, earth and space science, and environmental science in grades 7-12. Prerequisites: EDUC 101, and (EDUC 102 or EDUC 201), and (EDUC 334 or EDUC 335). EDUC 335 is required for environmental science.

EDUC 359. Student Teaching: Secondary. 3 Credits.
Offered Spring Semester Only; Lecture hours:Varies,Other:35
Supervised practice in the design and implementation of instruction in secondary school classrooms. Emphasis on professional conduct and use of theory to inform practice. Corequisite: EDUC 459.

EDUC 362. Quantitative Research Methods. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course emphasizes the design of quantitative research and the development of skills in analyzing and interpreting data. Quantitative research in education and psychology is critiqued in terms of theory, past research, hypothesis generation, and research design. Data input and analysis involves the use of the statistical software package SPSS.

EDUC 364. Qualitative Research Methods. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This is an introduction to the foundations of qualitative design in education, including: history, philosophy, nature, types, examples, and the challenges associated with data collection and its interpretation.

EDUC 375. ESL Methods: Instruction and Assessment. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course focuses on preparing students to teach students for whom English is their second language (ESL). It focuses on three primary areas: instructional materials development for ESL; assessment and support of ESL students; and cultural awareness and sensitivity. Fieldwork and clearances required for certification students.

EDUC 3NT. Education Non-traditional Study. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Education non-traditional study course. Prerequisite: permission of the instructor.

EDUC 415. Honors Thesis in Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Individual research, leading to an honors thesis in education. Supervised by an instructor in the department of education. Prerequisites: permission of the instructor, department, instructor and University Honors Council.

EDUC 425. Internship in Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Supervised practice in an educational setting including a structured reflection component. This course may be used to fulfill the Culminating Experience course requirement for the B.A. in education.

EDUC 439. Student Teaching in Music. 3 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:35
Student teaching in music. Corequisite: MUSC 335. Prerequisite: permission of the instructor.

EDUC 449. Professional Seminar in Elementary Education. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Systematic approach to the observation, interpretation, verification and remediation of problems affecting student learning. Psychological and sociological theory informing teaching practice. Implications of student diversity for adaptation of instruction. Prerequisites: Senior status and permission of the instructor. Corequisite: EDUC 349.

EDUC 459. Professional Seminar in Secondary Education. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Systematic approach to the observation, interpretation, verification, and remediation of problems affecting student learning. Psychological and sociological theory informing teaching practice. Implications of student diversity for adaptation of instruction. Prerequisite: permission of the instructor. Corequisite: EDUC 359.

English

Faculty

Professors: Raphael Dalleo (Chair, Literary Studies Director), Michael Drexler, Eric S. Faden, Elena Machado Sáez, Ghislaine G. McDayter (Associate Provost for Research & Creative Inquiry), Robert A. Rosenberg, Anthony F. Stewart (Associate Dean of Arts & Humanities), G.C. Waldrep III (Creative Writing Director), Virginia Zimmerman

Associate Professors: Christopher Camuto, Ken Eisenstein (Film/Media Studies Director), Brian Hauser, K. A. Hays, Jean Peterson, Meenakshi Ponnuswami, Joseph Scapellato, Paul Siewers

Assistant Professors: Elinam Agbo, Josie Barth, Kenton Butcher, Jeremy Chow, Bix Gabriel, Chase Gregory, Ted Hamilton

Visiting Assistant Professors: Steven Beardsley, James Buck, Emily L. Loney

Adjunct Instructor: Daniel A. Nienhuis

Lecturer: Rebecca Meyers

Video Production Specialist: Daniel A. Nienhuis

Academic Film Programmer: Rebecca Meyers

From Beowulf to Toni Morrison, from eco-poetry to Hitchcock films, the texts and images that we read help us to find wisdom across cultures, communicate what we know, initiate change and create the images and texts of the future.

To those ends, Bucknell's English department offers three majors and accompanying minors: creative writing, film/media studies and literary studies. Students may also double-major or triple-major across programs in English and in other fields.

In addition, English partners with the Stadler Center for Poetry & Literary Arts, the Campus Theatre, the Griot Institute for the Study of Black Lives & Cultures, the Film/Media Production Studio, and the Bucknell University Press to provide a wide range of opportunities for students in its majors and courses.

Majors are well prepared for careers in publishing, film and media, journalism, law, management and other fields. They are novelists, travel writers, literary agents, filmmakers, public relations professionals, doctors and educators. They work in business, arts administration, digital humanities, publishing, advertising and human relations, across for-profit and nonprofit sectors. They also are well prepared for graduate school and possess four of the top characteristics needed in successful careers everywhere: critical thinking, skillful communication, empathy and creativity.

Creative Writing

Faculty

Professors: Robert A. Rosenberg, G.C. Waldrep III (Creative Writing Director)

Associate Professors: Christopher Camuto, Brian Hauser, K. A. Hays, Joseph Scapellato

Assistant Professors: Elinam Agbo, Bix Gabriel

Visiting Assistant Professor: James Buck

The Creative Writing Program offers students the opportunity to focus their study on the creation of literary texts through workshops in poetry, fiction and creative nonfiction. Immersed in the study of the literary tradition, students will practice craft and technique, develop voice and style and gain exposure to a wide and diverse set of voices in contemporary literature as inspiration for their own work. The program partners with the Stadler Center for Poetry & Literary Arts to provide a diverse reading series and a vibrant slate of writers in residence, as well as internships on campus, thereby enhancing connections with living writers and enabling students to apply their skills beyond the classroom.

In creative writing courses, students synthesize conceptual, formal, aesthetic and technical elements resulting in the creation of works of art. Creative writing courses also involve the study of literary writing with a strong emphasis on contemporary texts and diverse voices. Group workshops and individual conferences support the writing process, and at the same time teach techniques of writing in prose and in poetry. Workshops give students frequent practice in articulating their critical ideas in relation to the work of their peers. The additional literary studies and film courses required for the major broaden students' understanding of the literary tradition and storytelling models. Seminar courses build oral communication skills through discussion leadership and/or formal presentation to the class, while many creative writing courses require performances in the form of students reading from their own work. Students gain information literacy in creative writing courses through writerly research on a wide variety of subjects, through required attendance at readings, and through virtual discussions and online discussion blogs. They navigate the landscape of the current literary world in the library and online as a way of gathering information on published writers, and to eventually submit their own work for publication. Creative writing majors learn to engage as ethical literary citizens through courses that build awareness of themselves as active, thoughtful participants in the literary community.

Students electing the creative writing major will take a minimum of nine courses as follows:

One 100-level or 200-level Creative Writing course	1
Three 200-level Creative Writing courses (at least one in poetry and one in prose)	3
Two 300-level Creative Writing courses [1]	2
One Literary Ethics & Citizenship ENCW course [2]	1
Two English department electives at the 200 level or above (one of which must be ENFS or ENLS)	2
An approved Culminating Experience [3]	
One of the nine courses in the major must be a course designated as satisfying a Racial & Ethnic Diversity requirement. [4]	

1 ENCW 302, ENCW 303 and ENCW 304 are repeatable if taken with different instructors. Therefore, a student may take the same 300-level seminar twice (with different instructors) as a way of fulfilling the 300-level creative writing requirements for the major.

2 For a current list of Literary Ethics & Citizenship ENCW courses, please see the English department website.

3 To complete the Creative Writing Culminating Experience, students must satisfy either of the following two requirements:
1. Write a senior thesis or honors thesis (a process which must have begun in your junior year per the Program Guidelines for thesis work).

2. Submit a creative writing portfolio per these guidelines:
Submit a portfolio of (a) 25-30 pages of your best work in prose (fiction and/or nonfiction); (b) 10-15 pages of poetry or (c) 20-30 pages of poetry and prose. Write an opening statement (two pages, single-spaced) about where you drew inspiration; what writers influenced you and how they influenced you; what craft elements you most improved upon during the course of your studies here; and how you see your work growing in the future. The work in the portfolio should not be new work, rather, a combination of work already produced over the course of your years at Bucknell and already read by the creative writing faculty. The portfolio should be submitted to your adviser for review. Your adviser will share the portfolio with the entire program faculty.

4 For a current list of Racial & Ethnic Diversity courses, please see the English department website.

The Creative Writing Minor will consist of five courses distributed as follows:

Creative Writing Minor

One 100-level or 200-level Creative Writing Course	1
One (additional) 200-level Creative Writing course	1
One 300-level Creative Writing seminar	1
One Literary Ethics & Citizenship ENCW course	1
One English Department elective (must be ENFS or ENLS)	1

Majors in Creative Writing will be able to:

1. Read a variety of texts from diverse literary traditions and respond to their aesthetic, social and/or cultural implications; (1, 3, 4, 6)

2. Write in multiple literary genres, developing craft and technique, voice, style and a creative identity while deepening a sense of subject matter. (1, 2, 3, 7)

3. Articulate effectively, in written and oral critiques, insights about peer work in progress. (1, 6, 7, 9)

4. Engage with the literary community beyond the classroom. (1, 2, 5, 9)

Numbers in parentheses reflect related Educational Goals (http://www.bucknell.edu/x50032.xml)of Bucknell University.

Courses

ENCW 101. Creative Writing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to creative writing through the reading and writing of poetry and prose (fiction or creative nonfiction). Prerequisite: seniors by permission of the instructor.

ENCW 102. Writing Fiction. 1 Credit.
Offered Occasionally; Lecture hours:3
In this introduction to writing fiction workshop, students will read and discuss contemporary and classic texts with a writer's eye. Completing fiction exercises and revisions as well as responding to one another's work, they will use the techniques and habits of successful writers to enhance their own writing and creativity.

ENCW 103. Writing Nonfiction. 1 Credit.
Offered Occasionally; Lecture hours:3
In this introduction to creative nonfiction, students will read and discuss nonfiction essays in a variety of subgenres—memoir, art and culture, nature, science, travel, personal reflection, opinion. The course pursues the goals of enhanced creativity while learning the adaptable resources of the creative nonfiction essay. Seniors by permission of instructor.

ENCW 104. Writing Poetry. 1 Credit.
Offered Occasionally; Lecture hours:3
In this introductory course in writing poetry, students will read and discuss poems with a writer's eye. Completing poetry exercises and revisions as well as responding to one another's work, they will build their own skills and expand their ideas of what poems can do. Seniors by permission of instructor.

ENCW 112. Writing Fiction: Black Writers. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this introductory creative writing course, students will read and discuss short fiction by Black women writers. They will be exposed to a range of genres and learn to read like writers. They will also complete fiction exercises and respond to one another's work.

ENCW 1NT. Creative Writing Non-traditional Study. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in English. Prerequisite: permission of the instructor.

ENCW 202. Fiction Workshop. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Principles of writing fiction, with constant practice. Designed for students planning to concentrate or minor in creative writing. Preference given to juniors, sophomores, and first-year students. Prerequisite: seniors by permission of the instructor.

ENCW 203. Creative Nonfiction Workshop. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Theory and practice of creative nonfiction, including travel writing, memoir, and other forms. Designed for students planning to concentrate or minor in creative writing. Preference given to juniors, sophomores, and first-year students. Prerequisite: seniors by permission of the instructor.

ENCW 204. Poetry Workshop. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Principles of writing poetry, with constant practice. Designed for students planning to concentrate or minor in creative writing. Preference given to juniors, sophomores, and first-year students. Prerequisite: seniors by permission of the instructor.

ENCW 205. Screenwriting for Television. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will conceive an original television series and draft the pilot episode. Additionally, students will read and critique successful pilot scripts for produced shows. This course acts as an introduction to the fundamentals of screenwriting conventions and techniques. Not open to students with credit for ENFS 205. Crosslisted as ENFS 205.

ENCW 210. Special Topic in Creative Writing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Studies in such topics as prosody, stylistics, characterization, or narrative theory. Course emphasizes formal or structural elements within particular genres and an appreciation of craft from a writer's perspective. Prerequisite: permission of the instructor.

ENCW 211. Topics: Writing Foreign Places. 1 Credit.
Offered Occasionally; Lecture hours:3
This course in the reading and writing of personal narrative and lyric essays about foreign places is designed for students interested in writing out of experiences of travel and/or other kinds of cultural displacement. Each student will define "foreign" in relation to him or herself.

ENCW 212. Literary Arts Administration and Editing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Focused on literary arts administration and editing, this course is particularly useful for students interested in careers in the world of arts administration and/or publishing. Prerequisite: permission of the instructor.

ENCW 220. Comedy and Satire Workshop. 1 Credit.
Offered Occasionally; Lecture hours:3
Students will explore satire and humor in fiction through the work of comic writers, including Kurt Vonnegut, George Saunders, and Donald Barthelme. The focus will be on analyzing craft (i.e. hyperbole, understatement, the surreal) and on employing these elements in exercises, stories, and class workshops.

ENCW 221. Topics: Short Short Fiction. 1 Credit.
Offered Occasionally; Lecture hours:3
Developing a sense of the foundational elements of short form fiction through reading and discussion of a variety of American and international writers, students will challenge conventions as they draft their own short form fiction and respond to one another's work.

ENCW 222. Topics: Writing Culture in Fiction. 1 Credit.
Offered Occasionally; Lecture hours:3
Students will be able to produce fictional work dealing with various aspects of their own culture, and with various aspects of cultures outside of their own, both with an eye to social consequence. Questions that will be considered: What constitutes a culture? What are its different manifestations in life?.

ENCW 230. Topics: Writing Nature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This nonfiction course explores writing about nature in a wide cultural and historical range of traditions with special attention to the ways in which human ideas about nature are inscribed in language and literary forms. Students will produce a portfolio of their own nature writing.

ENCW 231. Environmental Writing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This is a course in creative nonfiction focused on writing about the environment. Prerequisite: permission of the instructor.

ENCW 232. Topics: Literary Journalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Literary journalists engage the world via fact-based methods including interview, research, and first-hand observation. Using unique personal perspectives, they write in-depth, non-fiction stories employing both narrative and essayistic techniques. Students should aim to write with immediacy via vivid storytelling, while also placing events and experiences within broader cultural contexts.

ENCW 233. Writing the Anthropocene. 1 Credit.
Offered Occasionally; Lecture hours:3
This is a course in creative nonfiction writing devoted to the cultural and environmental significance of the Anthropocene and the contemporary response to sustainability issues raised by human impacts on the global environment.

ENCW 237. Internship. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:4; Repeatable
Two competitive internships are offered: Stadler Center Internship provides practical experience in and insight into arts management; West Branch Internship provides practical experience in and insight into literary publishing. Prerequisite: permission of the instructor.

ENCW 238. National Poetry Month Teaching in Schools. .5 Credits.
Offered Spring Semester Only; Lecture hours:1.5; Repeatable
In this course, students will learn a series of approaches to teaching poetry to 1st through 12th graders. In April, they will visit the Lewisburg Area School District and teach generative poetry lessons to local elementary, middle and high school students for National Poetry Month.

ENCW 240. Ecopoetics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
An exploration of poetry as site-specific ecological practice. Intended for students interested in both Creative Writing and Environmental Studies. Prerequisite: permission of the instructor. Crosslisted as ENST 227.

ENCW 241. Topics: Poetry, Mind, Nature. 1 Credit.
Offered Occasionally; Lecture hours:3
In the reading and writing of poetry that observes the natural world explores the relationship between such poetry and the human imagination. The course involves workshops as well as fieldwork, which provides material for poems and increases students' ability to identify local flora and fauna. Prerequisite: permission of the instructor.

ENCW 242. Long Poems & Sequences Workshop. 1 Credit.
Offered Occasionally; Lecture hours:3
Students will read and discuss a variety of long poems and poetic sequences as a way of exploring various structures and subjects for the two long poems or sequences they will write and workshop over the course of the semester. Some degree of comfort with poetic process is expected.

ENCW 250. The Writing World. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Students will discover and engage with the Creative Writing community at Bucknell (as well as with the greater writing community) through a community- and career-focused sequence of practical assignments, culminating in a group project in which students will identify a local need and design an event to address it.

ENCW 2NT. Creative Writing Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3; Repeatable
Non-traditional study in Creative Writing. Prerequisite: permission of the instructor.

ENCW 302. Advanced Fiction Workshop. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced workshop in the writing of fiction. Prerequisites: Any 200-level Creative Writing (ENCW) course in creative nonfiction or fiction and permission of the instructor.

ENCW 303. Advanced Creative Nonfiction Workshop. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced workshop in the writing of creative nonfiction. Prerequisites: Any 200-level Creative Writing (ENCW) course in creative nonfiction or fiction and permission of the instructor.

ENCW 304. Advanced Poetry Workshop. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced workshop in the writing of poetry. Prerequisites: Any 200-level Creative Writing (ENCW) course in poetry and permission of the instructor.

ENCW 312. Black Sci-Fi Workshop. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this advanced workshop, students will read and discuss speculative short stories, novellas, and novels by Black writers. They will practice reading like writers and respond critically to their peers' work. Students will produce and revise one full-length story, or the first chapter of a novel/novella.

ENCW 319. Individual Projects in Creative Writing. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual special projects supervised by instructor. Prerequisite: permission of the instructor.

ENCW 323. Writing the Novel. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Students will produce the first draft of a novel or section thereof. The first half of the semester will emphasize composition; the second, revision. Students will read a variety of novels and speak with authors. Prerequisite: any 200-level ENCW course in creative nonfiction or fiction and permission of the instructor.

ENCW 379. Senior Thesis. 1 Credit.
Offered Spring Semester Only; Lecture hours:Varies,Other:3; Repeatable
The writing of a scholarly or creative departmental senior thesis. Students must confer with and submit a proposal to an adviser prior to registering for the thesis. Prerequisite: permission of the instructor.

ENCW 380. Honors Thesis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
The writing of a scholarly or creative honors thesis. Students must confer with and submit a proposal to a departmental adviser and to the University Honors Council for approval. Prerequisites: senior status and permission of the instructor.

ENCW 3NT. Creative Writing Non-traditional Study. 1-1.5 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in Creative Writing. Prerequisite: permission of the instructor.

Film & Media Studies

Faculty

Professor: Eric S. Faden

Associate Professors: Ken Eisenstein (Film/Media Studies Director), Brian Hauser

Assistant Professor: Josie Barth

Affiliated Faculty: Bastian Heinsohn, John C. Hunter

Adjunct Instructor: Daniel A. Nienhuis

Lecturer: Rebecca Meyers

Video Production Specialist: Daniel A. Nienhuis

Academic Film Programmer: Rebecca Meyers

Film and media have become major cultural forms in the 21st century and their study is now an important part of a modern humanities education. The film/media studies major teaches students to critically engage, understand and produce moving images. Courses challenge students to think historically, theoretically and analytically about a wide range of audiovisual media including cinema, radio, television and new media. The film/media

studies major also encourages students to apply their knowledge by producing creative work in media production courses. Film/media studies is partnered with Lewisburg's Campus Theatre for classroom screenings and also uses the Marts Film/Media Production Studio for production classes.

Courses in the film/media studies major provide disciplinary depth through: 1. Skills in writing. Students majoring in film/media studies perform significant written analysis of film and media texts. 2. Skills in formal presentation. Several courses in film/media studies require dynamic and persuasive oral presentations. These courses cultivate presentation skills through practicing presentational strategies and integrating multimedia content to support student ideas and arguments. 3. Information literacy. Film/media majors learn how to research and evaluate primary and secondary sources through written and visual work plus in-class discussion.

Students may take the ENLS or a department elective course and one Group One course in an adviser-approved, off-campus study program. Further course transfers to the major from off-campus programs require specific adviser approval.

Students interested in exploring film/media studies are encouraged to start with ENFS 130 Introduction to Film/Media Studies; however, a number of our Group One 200-level courses could also serve as entry points. Note that the production track, which begins with ENFS 253, requires ENFS 130. All declared ENFS majors are required to attend at least three Tuesday screenings at the Campus Theatre per semester. All majors must also serve as a crew member on a senior ENFS major's film project in their sophomore or junior year.

Beyond ENFS 130, the major requires a minimum of nine additional courses as described below:

Core classes:

ENFS 130	Introduction to Film/Media Studies	1
ENFS 242	Film and Media History	1
ENFS 337	Seminar in Film/Media Theory	1

Department classes:

One 199-level or above ENLS course	1
One 200-level or above course from the English department	1
One course from inside or outside the English department, approved by the student's adviser	1

Students choose two courses from each group below:

Group 1:

ENFS 234	National Cinemas	1
ENFS 235	Gender and Film/Media	1
ENFS 238	Special Topics in Film/Media Studies	1
ENFS 244	Race and Film	1
ENFS 245	Televisual Culture	1
ENFS 246	Documentary & Avant-Garde Cinema	1
ENFS 247	Film/Media Genres and Auteurs	1
ENFS 256	Film Analysis: Images to Data	1
ENFS 273	Evolution of Digital Media	1
ENFS 338	Seminar in Film/Media Studies	1
ENFS 347	Seminar in Film/Media Genres and Auteurs	1

Group 2:

ENFS/ENCW 205	Screenwriting for Television	1
ENFS 206	Screenwriting for the Short Film	1
ENFS 253	Introduction to Film/Media Production	1
ENFS 254	Film Exhibition and Programming	1
ENFS 307	Advanced Screenwriting	1
ENFS 335	Special Topics in Film/Media Production	1
ENFS 339	Advanced Film/Media Production	1

Seniors majoring in film/media studies must successfully complete ONE of the following options to fulfill the Culminating Experience requirement:

- successfully defend an honors thesis in film/media studies;

- complete a one-semester ENFS independent study project in either semester of the senior year. This project may be critical or creative;
- create a short film or screenplay according to parameters available from their adviser, on the program website, or from the program director before the specified deadline;
- write an original work of film or media criticism, analysis, theory or history in the form of a six to 10-page essay to be published on the Bucknell Film Review's webpage. Further guidelines are available from the student's adviser, the program director or on the program website.

Film and media have become major cultural forms in the 21st century and their study is now an important part of a modern humanities education. The film/media studies minor teaches students to critically engage with, understand and produce moving images. Courses challenge students to think historically, theoretically and analytically about a wide range of audiovisual media including cinema, radio, television and new media. The film/media studies minor also encourages students to apply their knowledge by producing creative work in media production courses. Film/media studies is partnered with the Campus Theatre for classroom screenings and also uses the Marts Film/Media Production Studio for production classes.

The minor in film/media studies requires five courses:

ENFS 130	Introduction to Film/Media Studies	1
Three 200-level courses in film/media studies with at least one course from Group 1 and Group 2 below		3
One 300-level course from Group 3 below		1

Group 1:

ENFS 234	National Cinemas	1
ENFS 235	Gender and Film/Media	1
ENFS 238	Special Topics in Film/Media Studies	1
ENFS 242	Film and Media History	1
ENFS 244	Race and Film	1
ENFS 245	Televisual Culture	1
ENFS 246	Documentary & Avant-Garde Cinema	1
ENFS 247	Film/Media Genres and Auteurs	1
ENFS 256	Film Analysis: Images to Data	1
ENFS 273	Evolution of Digital Media	1

Group 2:

ENFS/ENCW 205	Screenwriting for Television	1
ENFS 206	Screenwriting for the Short Film	1
ENFS 253	Introduction to Film/Media Production	1
ENFS 254	Film Exhibition and Programming	1

Students may also propose a relevant course from outside the film/media studies program to fulfill the 200-level course requirement. Students should consult with the minor's coordinator for course approvals.

Group 3:

ENFS 307	Advanced Screenwriting	1
ENFS 335	Special Topics in Film/Media Production	1
ENFS 337	Seminar in Film/Media Theory	1
ENFS 338	Seminar in Film/Media Studies	1
ENFS 339	Advanced Film/Media Production	1
ENFS 347	Seminar in Film/Media Genres and Auteurs	1

Program Learning Goals and Outcomes

Students will learn:

1. About the surprising array of divergences and convergences in the vast international history of film, broadcast and digital media.

    Outcome: They will be able to locate film/media artifacts across historical and international contexts. (1, 9)

2. To analyze film, broadcast and digital media through a vocabulary of key formal techniques, patterns and styles in film, broadcast and digital media and to analyze those elements within various theoretical frameworks.

Outcome: They will analyze formal and theoretical elements in film, broadcast and digital media. (1, 9)

3. The technical skills required to produce original and thoughtful work and how to develop an artistic vision that applies an understanding of the aesthetics, theory and history of moving image and other media practices.

Outcome: They will produce creative media informed by the study of that practice. (1, 2)

4. How media have both encoded and resisted culturally dominant ideas and forms in production, distribution and reception.

Outcome: They will recognize the dominant and alternative cultural codes in film, broadcast and digital media. (3, 5, 9)

5. To effectively research film and media through scholarly and archival sources and then elegantly present arguments, new ideas and analysis in written and/or multimedia essays.

Outcome: They will be able to conduct original research and persuasively present their findings. (6, 7, 8)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

ENFS 130. Introduction to Film/Media Studies. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:3
Introduction to film grammar, history, genres, and movements using theoretical text and primary source films with an emphasis on critical thinking. Weekly screenings.

ENFS 140. Basic Production Skills. .5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:1.5
This half-credit studio course introduces essential video production skills. Students gain hands-on experience with cameras, production equipment and editing software. It can also help prepare students who lack video experience, but are interested in taking production courses in the Film/Media Studies curriculum, such as ENFS 253.

ENFS 1NT. Film/Media Studies Non-traditional Study. .25-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in Film/Media Studies. Prerequisite: permission of the instructor.

ENFS 205. Screenwriting for Television. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will conceive an original television series and draft the pilot episode. Additionally, students will read and critique successful pilot scripts for produced shows. This course acts as an introduction to the fundamentals of screenwriting conventions and techniques. Not open to students with credit for ENCW 205. Crosslisted as ENCW 205.

ENFS 206. Screenwriting for the Short Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will learn the fundamentals of screenwriting conventions and technique as they draft short film screenplays. Attention will be given to visual writing, dramatic structure, and writing with a production budget in mind.

ENFS 232. New German Cinema. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the influential film movement that took place in Germany from the 1960s to the 1980s. A new generation of filmmakers confronted the legacy of fascism and addressed taboo topics surrounding guilt and the trauma of violence in new visual language. The movement helped shape a new self-aware German identity through its films. Crosslisted as GRMN 280.

ENFS 234. National Cinemas. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3; Repeatable
Concentration on the history and style of a particular national cinema. Weekly screenings.

ENFS 235. Gender and Film/Media. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Current debates about gender and American film/media, from WW II to the present. Diverse critical approaches for interpreting film/media within the broad context of gender studies. Crosslisted as WMST 235.

ENFS 238. Special Topics in Film/Media Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:Varies; Repeatable
Examination of a specialized topic in film/media studies.

ENFS 242. Film and Media History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines major industrial, technical, and cultural milestones in the history of the cinema, radio, television, and new media industries.

ENFS 244. Race and Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
This course explores the representation of race in American cinema. Special attention is paid to Race Films, independent all-black productions made from 1918-1948. Weekly screenings.

ENFS 245. Televisual Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on television, examining the subject from a variety of theoretical viewpoints—industrial practices, stylistic modes and audience reception.

ENFS 246. Documentary & Avant-Garde Cinema. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Examines the history and style of non-fiction and experimental cinema in order to explore the importance of recording the world in the most direct and the most abstract fashion. Weekly screenings.

ENFS 247. Film/Media Genres and Auteurs. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3; Repeatable
Examination of a particular film/media genre (film noir, melodrama, Hong Kong action movies, Westerns, etc.) or a close examination of a particular director, cinematographer, screenwriter, or producer's oeuvre. Weekly screenings.

ENFS 253. Introduction to Film/Media Production. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introductory level, studio-based course covering the basics of moving image practice, from pre-visualization to principles and techniques of cinematography, editing, lighting and sound. Students produce individual projects, developing both technical skills and personal vision. In-class screenings further students' awareness of cinema's expressive potential. Prerequisite: ENFS 130.

ENFS 254. Film Exhibition and Programming. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides a historical and practical perspective on various strategies for independent and alternative film programming and exhibition. Coursework culminates in the production of the Bucknell Intercollegiate Film Festival (BIFF), held biennially at the Campus Theatre. Class participants curate the program and organize all aspects of the festival.

ENFS 256. Film Analysis: Images to Data. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines various research methodologies for conducting original research through analysis of film and media texts. Students will practice these approaches through written analyses, image annotation, quantitative data visualizations, multimedia presentations and video essays. Prerequisite: ENFS 130.

ENFS 273. Evolution of Digital Media. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will trace the origins and development of the digital media products and practices that surround us in contemporary life. Although digital media are often represented as unprecedented and entirely "new," their growth follows patterns that were established in the industrial revolution and that this course will analyze. Crosslisted as HUMN 273.

ENFS 2NT. Film/Media Studies Non-traditional Study. .25-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3; Repeatable
Non-traditional study in Film/Media Studies. Prerequisite: permission of the instructor.

ENFS 307. Advanced Screenwriting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Advanced workshop in the writing of feature-length screenplays. Students will draft a complete feature script (90-120 pages) over the course of the semester. Prerequisites: ENFS 205 or ENCW 205 or ENFS 206 or permission of the instructor.

ENFS 319. Campus Theatre Internship. .5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:1.5; Repeatable
Learn the hands-on skills of how to project DCP, 16mm, and 35mm at the Campus Theatre while reading about major shifts in the history of film exhibition. Application process.

ENFS 320. Individual Projects/Independent Study. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Develop a course, in consultation with a faculty member, tailored to individual needs and creative or scholarly interests. Planning begins in the course registration period of the semester prior to taking the class, allowing time to develop parameters and create a syllabus.

ENFS 335. Special Topics in Film/Media Production. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This seminar focuses on specific production (lighting, cinematography) and post-production (sound design, editing, color grading) areas to provide students with an in-depth knowledge of specialized production skills. Prerequisite: ENFS 253.

ENFS 337. Seminar in Film/Media Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Survey of approaches to film/media analysis and critique, ranging from realist/formalist debates to psychoanalytic, feminist, and semiotic approaches. Weekly screenings. Prerequisites: ENFS 130.

ENFS 338. Seminar in Film/Media Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:Varies; Repeatable
Examination of a specialized topic in film/media studies. Prerequisite: ENFS 130.

ENFS 339. Advanced Film/Media Production. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This seminar applies creative practice and knowledge to advanced video/audio production through a range of hands-on production assignments. Prerequisites: ENFS 253.

ENFS 340. Film/Media Production Practicum. .5 Credits.
Offered Either Fall or Spring; Lecture hours:1.5; Repeatable
The Film/Media Production Practicum provides students with advanced and specialized study in a particular area of Film/Media production. Possible practicum topics might include advanced sound design, color grading, visual effects works, or specialized cinematography techniques. Prerequisite: ENFS 253.

ENFS 347. Seminar in Film/Media Genres and Auteurs. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3; Repeatable
Examination of a particular genre (film noir, Hong Kong action movies, Westerns, etc.), director, cinematographer, screenwriter or producer. Weekly screenings. Prerequisite: ENFS 130.

ENFS 380. Honors Thesis. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Scholarly or creative honors thesis. Students must confer with and submit a proposal to a departmental adviser and to the University Honors Council for approval. Prerequisites: senior status and permission of the instructor.

ENFS 3NT. Film/Media Studies Non-traditional Study. .25-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in Film/Media Studies. Prerequisite: permission of the instructor.

Literary Studies

Faculty

Professors: Raphael Dalleo (Chair, Literary Studies Director), Michael Drexler, Elena Machado Sáez, Ghislaine G. McDayter (Associate Provost for Research & Creative Inquiry), Anthony F. Stewart (Associate Dean of Arts and Humanities), Virginia Zimmerman

Associate Professors: Jean Peterson, Meenakshi Ponnuswami, Paul Siewers

Assistant Professors: Kenton Butcher, Jeremy Chow, Chase Gregory, Ted Hamilton

Visiting Assistant Professors: Steven Beardsley, Emily L. Loney

Literary studies offers students courses in global English literatures, from medieval poetry to postmodern theory, supporting their growth as critical writers and readers with skills in literary rhetoric and poetics, and with empathy for varied cultures. It fosters a range of student research, honors projects and internships aimed at developing skills in critical thinking and writing, and rhetorical and narrative analysis, including both experiential and logical understanding of how narratives shape our lives and how we shape cultural narratives.

The study of a breadth of world literatures in English across centuries enables students to develop a deeper understanding of human experience and their own place in larger contexts of life. Literary studies majors and minors also engage with the program's affiliated centers — the Bucknell University Press and the Griot Institute for the Study of Black Lives & Cultures — and with affiliated initiatives such as digital humanities, environmental humanities, and health humanities at Bucknell.

The literary studies major offers students, through the disciplinary depth of its coursework: (a) focus on writing as an evidence-based and public rhetorical craft drawing on models from diverse critical and persuasive traditions; (b) practice and instruction in presenting work through public speaking in class or conference presentations; and (c) instruction and practice in information literacy through the developing field of digital humanities (including blogging, online research and analysis of digital sources) and in more traditional library skills. Its emphasis on seminar work supports development of these skills, which are highlighted in both the general major and in its optional race & literature concentration.

Literary Studies Major

The minimum requirement for a major in literary studies is nine courses. Foundation seminars will not satisfy the major. One 100-level course in addition to ENLS 199 Introduction to Literary Studies may be counted toward the major.

The literary studies major and its concentration in race & literature (details of which are below) share a core of three requirements: the Survey in English & American Literature, a pre-1700 course requirement, and coursework on race/ethnicity in literature. Topics for other courses are electives in the general major and more specific in the concentration. Both require three seminars. The specific requirements for the general literary studies major follow in the table below, with those for the concentration listed afterward.

ENLS 199	Introduction to Literary Studies [1]	1
One Race/Ethnicity Literature Course at the 200 level or above [2]		1
One Pre-1700 Literature Course at the 200 level or above [2]		1
At least two additional ENLS courses at the 200 level or above		2
Four additional electives within the English department, at least three of which must be at the 200 level or above [3]		4
At least three of the ENLS courses taken must be 300-level seminars. [4]		
Culminating Experience [5]		

1 Literary studies majors are strongly encouraged to take this course as early in their program of coursework as possible.
2 For a current listing of these courses, please see the English department website.
3 May include additional seminar courses.
4 ENLS 319 Individual Projects in Literary Studies will not satisfy the seminar requirement.
5 Requires seniors majoring in literary studies to compile a portfolio of representative work from each year of their college education; students will include short reflections on each piece of writing as well as a summary reflection. Specific requirements for the portfolio will be provided by the program director early in the fall semester. Students may consult the program director if they wish to suggest an alternative project as their Culminating Experience, such as an honors or department thesis.

Concentration in Race & Literature

The literary studies major includes a concentration in race & literature as an option that enables students to focus on African American, Latino/a, Caribbean, Asian American, and Native/American Indian/Indigenous literatures and critical theories of race.

The race & literature concentration is designed to highlight curricular offerings in English that examine the social phenomenon of race as it is expressed, queried and subverted in literature. Its primary focus will be on minority and ethnic literatures of North America, with particular interest in the centrality of race issues in American culture, but will also extend to global literatures and theoretical models involving issues of race. The goal of the concentration is to enable students to develop a coherent focus in their studies on theoretical models regarding race as applied to literature. Overall, however, as a concentration it will share the existing philosophy and learning goals of the major in literary studies, of which it will form a part. Research writing, presentations and applications of digital humanities (including digital storytelling) will all be important parts of the concentration, which also will draw on resources and programs of the Griot Institute for the Study of Black Lives & Cultures.

ENLS 199	Introduction to Literary Studies [1]	1
ENLS 203	Introduction to Race and Literature	1
A pre-1700 course or an 18th-century course relevant to the concentration's subject matter, at the 200 level or above.		1
Two 200-level courses in African American; Latino/a; Native American/Indigenous/American Indian; Asian American; Caribbean literatures; and/or comparative studies of multiple racial traditions selected in conversation with adviser.		2
Three seminars in literary studies, of which at least two must have race & literature as their primary focus (African American; Latino/a; Native American/Indigenous/American Indian; Asian American; Caribbean literatures; and/or comparative studies of multiple racial traditions). [2]		3
One elective at the 100 level or above in any program within the English department.		1
Culminating Experience. [3]		

1 Majors are strongly encouraged to take this course as early in their program of coursework as possible.
2 ENLS 319 Individual Projects in Literary Studies will not satisfy the seminar requirement.
3 Requires seniors majoring in literary studies to compile a portfolio of representative work from each year of their college education; students will include short reflections on each piece of writing as well as a summary reflection. Specific requirements for the portfolio will be provided by the program director early in the fall semester. Students may consult the program director if they wish to suggest an alternative project as their Culminating Experience, such as an honors or department thesis.

For a current listing of courses meeting the required topics for the concentration, please see the English department website.

Literary Studies Minor

Literary studies offers students courses in global English literatures from medieval poetry to postmodern theory, supporting their growth as critical writers with skills in literary rhetoric and poetics, and with empathy for varied cultures. It fosters a range of student research, honors projects and internships aimed at developing skills in critical thinking and writing, rhetorical and narrative analysis, as well as experiential and logical understanding of how narratives shape our lives, and how we shape cultural narratives. The study of a breadth of world literatures in English across centuries enables students to develop a deeper understanding of human experience and their own place in larger contexts of life. Literary studies minors also

can engage with the Bucknell University Press and the Griot Institute for the Study of Black Lives & Cultures, and affiliated initiatives such as digital humanities, health humanities and environmental humanities at Bucknell.

The English minor in literary studies consists of a minimum of five courses:

One ENLS course at the 100 level or above.	1
Three ENLS courses above the 100 level (ENLS 199 Intro to Literary Studies may count as a course above the 100 level).	3
One ENLS seminar at the 300 level (not counting ENLS 319, Individual Projects).	1

Students planning to minor in literary studies are strongly encouraged to meet with a professor in the literary studies program to construct a coherent minor that focuses on a particular area of study (for example, race & ethnic studies, dramatic literature, literary theory, medieval and renaissance literature, women writers, or Anglophone literature).

(1) Students will analyze and interpret a wide variety of literary texts in English, drawing on close reading, aesthetic and rhetorical principles, and/or secondary sources in literary criticism and theory.

(2) Students will understand complex, multiple connections between texts and their historical, cultural and political contexts.

(3) Students will develop critical awareness of the racial and ethnic diversity of literatures in English, and of the influence of race and ethnicity on literary production and interpretation.

(4) Students will develop the ability to ask productive questions and to engage in open-ended discussion and debate.

(5) Students will produce solidly argued and effective writing about literature.

(6) Students will come to appreciate the fundamental ambiguities and complexities inherent in problems posed by literary texts.

Courses

ENLS 101. Ways of Reading. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Introduction to the critical study of literature.

ENLS 103. Public Writing for Media: Rhetoric for a Digital Age. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will help students develop skills in effective writing for a public audience across a range of types of digital and print media--including journalism, blogs, short video scripts, email lists, and even social media such as Twitter. The course will draw on basics of Classical Rhetoric, the instructor's experience.

ENLS 108. Intro to Multiethnic Literatures of the US. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to multiethnic literatures of the United States, by writers from different historical time periods and ethnic backgrounds.

ENLS 109. Public Speaking in the 21st Century. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Introduction to public speaking with a focus on historical speeches. Study and practice of speech writing and organization, verbal and nonverbal communication.

ENLS 115. Introduction to Poetry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduces students to a range of poetic forms from various historical periods.

ENLS 116. Introduction to the Novel. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduces students to a wide array of novel forms and genres from the rise of the novel to the contemporary novel.

ENLS 117. Introduction to Dramatic Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to and focus on drama as an integral genre that is vital to the study of literature and performance. This course offers a sustained examination of plays and playwrights from various geographies, time periods, politics, and positions. Priority given to first year students.

ENLS 118. Introduction to Children's Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to children's literature. The course may be organized as a survey of the genre or may focus on special topics. Topics may include forms of the genre, including fiction and poetry, as well as literature for young readers of different ages, or may be thematic.

ENLS 120. Literature and the Environment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Interdisciplinary study of major texts which demonstrate an abiding interest in nature and in cultural and social values concerning the environment.

ENLS 125. Introduction to Law and Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the relationship between law and literature, from literature's fascination with legal process to the law's use of narrative, rhetoric and imagination. Students will study texts from various periods and cultural settings that explore the meaning of justice, the nature of legal institutions and the power of law in society.

ENLS 128. Introduction to LGBTQ+ Literatures & Media. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces literatures and media by and about LGBTQ+ individuals. In addition to the varied genres and media, this course will also introduce theories of gender, sexuality, and queerness.

ENLS 199. Introduction to Literary Studies. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
An introduction to themes and topics in Literary Studies with an emphasis on skills in literary analysis.

ENLS 1NT. Literary Studies Non-traditional Study. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies; Repeatable
Non-traditional study in Literary Studies. Prerequisite: permission of the instructor.

ENLS 201. Public Rhetoric and Literary Journalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
The art of rhetoric, including poetics, has roots in the ancient liberal arts, yet remains directly applicable to contemporary literary journalism in a digital environment. This course will apply this art, through study of past literary journalism, and projects in writing the same for public audiences online, to current issues.

ENLS 203. Introduction to Race and Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Examines the social construction of race as it is expressed, queried and subverted in literature. Students learn to understand and apply key concepts from critical race studies and ethnic studies. The course takes an intersectional and comparative approach to introduce how race functions in different times, places and ethnic contexts.

ENLS 205. Early American Colonial Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of American literature from Columbus through the American Revolution.

ENLS 208. 19th C American Lit American Realism and Naturalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of selected texts by American writers from 1865 to 1900.

ENLS 209. Modern American Literature 1900-1950. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of selected texts by American writers from 1900-1950.

ENLS 213. Special Topics in American Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected special topics in American literature.

ENLS 214. US Latino/a Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to literature written in English by Latinos/as in the United States. The course readings will include creative writing by various Latino/a groups, for example, Mexican-Americans, Puerto Ricans, Cuban-Americans, and Dominican-Americans. Additionally, the class will expose students to a variety of interpretive frameworks via secondary sources in US Latino/a Studies.

ENLS 217. Studies in Dramatic Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected movements and topics in drama such as Restoration drama, African American dramatic literature, the Theatre of the Absurd.

ENLS 219. Studies-Selected American Authors. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Authors selected from among Hawthorne, Emerson, Thoreau, Whitman, Dickinson, Cather, Melville, Wharton, James, H.D., Frost, Hemingway, Faulkner, O'Neill, Stein, Welty, O'Connor, and Morrison.

ENLS 220. Young Adult Fiction. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of literature that appeals to adolescent and young adult readers, with particular emphasis on British and American fiction and non-fiction prose from the 19th century to the present.

ENLS 221. Introduction to African American Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Provides a selection from across the vast array of examples collected under the inadequate rubric “African American Literature.” We'll read poetry, fiction, non-fiction, and drama in order to understand how a group of people who have been written out of American history and culture write themselves back into these stories. Crosslisted as CBST 221.

ENLS 222. Ethnic Comedy in the United States. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
History, theory, and practice of comedy in the United States, focused on works by comedians of many ethnicities. The course explores how comedy contributes to the national conversation on race, sometimes soothing social tensions with laughter and at other times sparking ethnic conflict.

ENLS 224. Visions of the Susquehanna. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines literature of the Susquehanna Valley. Prerequisite: permission of the instructor. Crosslisted as ENST 224.

ENLS 227. Caribbean Literature. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3
Introduction to selected literatures, cultures, and histories of the Caribbean, with close analysis of text and context. When taught in the summer, the course is the core of the Bucknell in the Caribbean summer study abroad program. Crosslisted as CBST 222 and LAMS 227.

ENLS 228. Gender and Sexuality in America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Literature and popular culture exploring such topics as construction of gender identities, sexualities, GLBT cultures and gender-based violence.

ENLS 229. Jewish American Comedy: Stage, Screen, Stand-up. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
We track the evolution of Jewish American comedy as a performance art from the early 20th century through the present, examining drama, film, and stand-up. Comedy is an important component of the Jewish American experience, and our course focuses particularly on questions of cultural assimilation and ethnic authenticity.

ENLS 239. Reading Race, Gender and Sexuality. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Exploiting the exclusionary nature of "High Modernism," this course highlights literature on the margins of modernism, revealing literature's political investment in race, class, and sexuality. Crosslisted as WMST 225.

ENLS 240. Medieval English Literature to 1485. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Survey of the poetry and prose of medieval England.

ENLS 241. The Green World. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the natural and environmental worlds revealed by British, American, or Anglophone literature.

ENLS 243. Chaucer. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The major works and language of Chaucer.

ENLS 244. Elvish Writing: Chaucer, Spenser and Ecopoetics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Major works of Chaucer and Spenser examined in the context of early Insular poetic traditions of intersubjectivity.

ENLS 245. Terror with a Human Face: Literary Resistance to Revolutionary Violence. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines how writers--in fiction, satire, and literary journalism--have resisted official justification of mass violence and cultural genocide in the name of social revolution. Explores works such as Orwell's 1984, Koestler's Darkness at Noon, Zamyatin's We, Solzhenitsyn's The Gulag Archipelago, and Arendt's The Origins of Totalitarianism.

ENLS 246. The Bible as Literature and Its Literary Legacy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the Bible as literature in the context of its emergence as a key text in early English literature, including issues of translation and connections with earlier biblical texts. It also examines examples of literature influenced by the Bible intertextually, across cultures and eras into modern times.

ENLS 247. Masculinity in Modern American Drama and Performance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
We track concepts and performance of masculinity in American theatre from the mid-1900s through the present and examine how contemporary expressions of masculinity bear the imprint of this legacy. Are contemporary codes of masculinity opening up or becoming more constrained? How is a man supposed to act?.

ENLS 250. Renaissance Literature, 1485-1660. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Survey of the poetry and prose of representative authors, including Spenser and Milton.

ENLS 251. Studies in Renaissance Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected major prose and poetry.

ENLS 254. Radical Black Drama & Performance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on a variety of playwrights who examine the predicament of blackness across a little more than a century. We pay particular attention to plays not just as artistic creations and entertainments, but also as political gestures that address that predicament.Crosslisted as CBST 255.

ENLS 255. Shakespeare and Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examine some of the interpretive and analytical question that the vast body of films based on the plays of Shakespeare invites.

ENLS 257. Shakespeare. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Selected plays.

ENLS 260. The Long Eighteenth Century. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Explores various British and Anglophone literary and textual forms from 1660-1820.

ENLS 261. Studies in Restoration and 18th-century Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected authors and various genres, including the relationship between literature and politics, history, and the sciences.

ENLS 266. Women Writing/Writing Women: Literature and Feminist Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to feminist thought with a special emphasis on the way in which women theorize their gender through writing and the way gender intersects with other identity categories such as race, class and sexuality in literature. Crosslisted as WMST 266.

ENLS 268. Jewish-American Literature and Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines the literary and cultural production of American Jews through the study of diverse series such as novels, short stories, plays and film.

ENLS 270. Romantic Literature, 1780-1832. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Examination of selected authors in poetry and prose, read in relationship to contemporary political and cultural influences.

ENLS 271. Studies in 19th-century English Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected major prose and poetry.

ENLS 272. Studies in Literature and the Environment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This course explores themes, currents, or topics in literature and the environment with a particular focus on theory, genre, and application.

ENLS 278. World Literature and Environmental Justice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines how writers from outside of Europe and the United States seek environmental justice through a range of literary forms. Crosslisted as ENST 278.

ENLS 279. Literature and Human Rights. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines literature in relation to human rights discourses from various time periods.

ENLS 280. Modern Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A selective introduction to the varied forms, significant authors, and literary movements from the turn of the century to the recent past.

ENLS 283. The Early English Novel. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The rise of the novel as a genre, and analysis of representative novels.

ENLS 284. The 19th-century English Novel. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Major developments in the novel as a genre and representative novels.

ENLS 285. Modern British and American Poetry, 1890-1960. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected major poets of England, the United States, and other English-speaking cultures.

ENLS 287. Modern Drama. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Studies in modern dramatic literature, theatre history, and performance theory.

ENLS 288. Studies in Contemporary Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
An intensive study of selected British and American authors of the past 40 years.

ENLS 289. Theatre in London. 1 Credit.
Offered Both Fall and Spring; Lecture hours:2,Other:3
This course is offered off campus in London through the Bucknell in London program. Introduces students to all aspects of the London theatre. Crosslisted as THEA 264.

ENLS 290. Special Topics. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3; Repeatable
Flexible in subject matter and in method. Topics such as Literature and Psychology, Literature and Myth, Science Fiction.

ENLS 297. The Teaching of English. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Discussion and practice related to the teaching of English in secondary schools. Required for 7 - 12 certification in English.

ENLS 2NT. Literary Studies Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3; Repeatable
Non-traditional study in Literary Studies. Prerequisite: permission of the instructor.

ENLS 300. Seminar in Literary Theory and Criticism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to graduate study, including literary and critical theory, research, and other elements of literary scholarship. Open to advanced undergraduates. Crosslisted as ENLS 600.

ENLS 301. Seminar in American Literature Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced topics, such as Cross-Cultural Encounters, The American Novel, Gender and American Poetics, and Beat Generations. Crosslisted as ENLS 601.

ENLS 302. Seminar in Selected American Writers. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of the works of one or more major American writers. Crosslisted as ENLS 602.

ENLS 305. Seminar in Early American Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Seminar in a special topic or genre of Early American and/or 18th-century American culture. Crosslisted as ENLS 605.

ENLS 306. US: Fever/Fantasy/Desire. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Seminar on American literature between 1770-1861 with an emphasis on psychoanalytic approaches to literary and cultural study. Authors may include Brown, Sansay, Poe, and Melville. Crosslisted as HUMN 306 and ENLS 606.

ENLS 310. Seminar in Modern American Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Seminar in a special topic, author, or genre of modern American literature and culture. Crosslisted as ENLS 610.

ENLS 311. Seminar in Contemporary American Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Seminar in a special topics, author, or genre of contemporary American literature and culture. Crosslisted as ENLS 611.

ENLS 319. Individual Projects in Literary Studies. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual special projects supervised by instructor. Prerequisite: permission of the instructor. Crosslisted as ENLS 619.

ENLS 320. Race & Gender in the 18th Century. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar explores and interweaves a variety of interdisciplinary approaches to apprehend eighteenth-century literature and culture (1660-1800). Focuses may include race, gender, sexuality, ability, class, postcolonialism, transnationalism, and environment. Crosslisted as ENLS 620 and HUMN 321.

ENLS 321. Seminar in African-American Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of selected thematic, aesthetic and ideological issues in Black American writing. Crosslisted as ENLS 621.

ENLS 324. Black Experimental Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar explores the theory, history and aesthetics of Black avant-garde cultural production spanning the twentieth and twenty-first centuries. Texts may include poetry, fiction, music and film. Crosslisted as CBST 324 and ENLS 624.

ENLS 327. Seminar in Caribbean Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of selected thematic, aesthetic and ideological issues in Caribbean writing.

ENLS 330. Nabokov and His Worlds. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Major works of one of the greatest authors of the 20th century. Nabokov's Russian and American periods examined in the context of both literary traditions. In English. Crosslisted as ENLS 630, RUSS 330 and RUSS 630.

ENLS 340. Seminar in Early Literature to 1485. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Literatures of the pre-modern world. Prerequisite: permission of the instructor. Crosslisted as ENLS 640.

ENLS 341. The Hidden God of Nature: Christian Ecopoetics from Chaucer to Dostoevsky. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3; Repeatable
Explores how great works of European and American literature related nature and culture in Christian traditions from the Middle Ages to today. Analyzes their legacy for environmental ethics and sustainable cultures. Includes non-Christian and secular critiques in considering poetic, rhetorical, symbolic, philosophical, and spiritual approaches to ecology. Prerequisite: instructor permission. Crosslisted as ENLS 641.

ENLS 350. Seminar in Renaissance Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Special topics. Student reports, oral and written. Crosslisted as ENLS 650.

ENLS 358. Seminar in Shakespeare. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Special topics on Shakespeare. Crosslisted as ENLS 658.

ENLS 362. Seminar in Translation Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Advanced seminar in the history, theory, and practice of translation, including investigation of the role of translation in intercultural communication and comparative studies. Facility in a language in addition to English is strongly recommended. Crosslisted as ENLS 662 and HUMN 340.

ENLS 370. Seminar in 19th-century English Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Examination of a wide range of poetry and prose by selected authors with emphasis given to the literature's historical and cultural groundings. Prerequisite: permission of the instructor. Crosslisted as ENLS 670.

ENLS 378. Thesis Workshop. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
A colloquium on problems arising from the writing of a scholarly thesis. Prerequisite: permission of the instructor. Crosslisted as ENLS 678.

ENLS 379. Senior Thesis. 1 Credit.
Offered Spring Semester Only; Lecture hours:Varies,Other:3; Repeatable
The writing of a scholarly or creative departmental senior thesis. Students must confer with and submit a proposal to an adviser prior to registering for the thesis.

ENLS 380. Honors Thesis. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
The writing of a scholarly or creative honors thesis. Students must confer with and submit a proposal to a departmental adviser and to the University Honors Council for approval. Prerequisite: senior status.

ENLS 382. Seminar in Contemporary Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A selective study of the most recent developments in English and American prose or poetry. Crosslisted as ENLS 682.

ENLS 391. Seminar in Poetry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A study of poetry as a genre and an analysis of the work of selected poets. Crosslisted as ENLS 691.

ENLS 392. Seminar in the Novel. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Special topics. Student reports, oral and written. Crosslisted as ENLS 692.

ENLS 393. Seminar in Contemporary Drama. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Special topics. Student reports, oral and written. Crosslisted as ENLS 693.

ENLS 394. History of Sexuality in Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of the history of sexuality through literature, interrogating issues of identity as related to fiction, poetry, and creative nonfiction. Crosslisted as ENLS 694.

ENLS 395. Seminar in Literature and the Environment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This advanced seminar emphasizes specialized currents in environmental humanities scholarship and theory (especially attuned to the field of literary study) with topics that may include environmental justice, environment and race, human-animal/plant relations, pollution/deforestation/environmental degradation, sea level rise, and climate change. Priority given to students in English. Crosslisted as ENLS 695.

ENLS 397. Seminar in Special Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics such as comparative literature, literature and the arts, queer theory, or satire. Crosslisted as ENLS 697.

ENLS 398. Issues in Literary/Critical Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
The study of Continental and American critical positions or schools from Modernism through Post-Structuralism. Crosslisted as ENLS 698.

ENLS 399. Seminar in Cultural Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Introduction to significant issues and debates characterizing the field known as Cultural Studies. Crosslisted as ENLS 699.

ENLS 3NT. Literary Studies Non-traditional Study. 1-1.5 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in Literary Studies. Prerequisite: permission of the instructor.

Environmental Studies & Sciences

Faculty

Professors: Matthew E. McTammany, Peter R. Wilshusen, Amanda Wooden

Associate Professor: Andrew Stuhl (Chair)

Assistant Professors: Janet Adomako, Jessica Pouchet

Affiliated Faculty: Claire Campbell (Professor-History), Kevin Gilmore (Associate Professor-Civil & Environmental Engineering), Duane A. Griffin (Associate Professor-Geography), Molly M. McGuire (Associate Professor-Chemistry)

Coordinating Committee: Janet Adomako (geography and environmental studies & sciences), Maria A. Antonaccio (environmental ethics), Claire Campbell (environmental history), Kevin Gilmore (civil and environmental engineering), Duane A. Griffin (geography), Molly M. McGuire (environmental chemistry), Matthew E. McTammany (ecology), Jessica Pouchet (environmental anthropology), Andrew Stuhl (environmental history), Peter R. Wilshusen (environmental planning and policy), Amanda Wooden (environmental politics and policy)

Environmental studies & sciences is the interdisciplinary examination of how natural sciences, policy studies, social sciences, humanities and engineering combine to inform inquiry of humanity's effects on and interrelationships with the natural world. This department educates the student to identify, analyze and respond to complex environmental issues by working with communities and experts in many fields. With a major in environmental studies, students have the latitude to create a course of study in an area of specialization and to develop a breadth of interdisciplinary and methodological knowledge in diverse environmental fields.

The department has two major tracks: a Bachelor of Arts in Environmental Studies and a Bachelor of Arts in Environmental Science. Each requires the interdisciplinary study of environmental issues and an understanding of the complexity of the relationship between humanity and the environment, while they allow the student to concentrate studies in a field of particular interest to that student. The B.A. in Environmental Studies is designed for those who want to develop core concentrations in the social sciences, policy, planning, law and the humanities, although a science concentration is also possible with this choice. The B.A. in Environmental Science is designed for students who want in-depth knowledge of natural sciences as the core of their interdisciplinary environmental education. **The B.A. in Environmental Science has an obligate second B.A. major in one of the following: biology, chemistry or geology.**

Most environmental studies and environmental science majors benefit from studying abroad. Field-based programs – such as School for Field Studies or School for International Training – are especially appropriate for environmental studies and environmental science students.

Bachelor of Arts in Environmental Studies

An interdisciplinary bachelor of arts major in environmental studies is offered for the student with an abiding interest in the general environmental problems faced by humans, and with special concern for their humanistic, policy and social sciences aspects. The B.A. in Environmental Studies is an integrative liberal arts degree that prepares students for a range of environmental and sustainability career paths such as: policy, planning, law, business, nonprofits, administration and education, or for graduate study in related fields.

The Bachelor of Arts in Environmental Studies major requires 10 courses distributed as follows:

ENST 201	Environmental Problems-Sustainable Futures	1
ENST 208	Environmental Biology	1
GEOL 203	Physical/Environmental Geology [1]	1
ENST 302	Community-Based Research Design	1
Two Integrative Elective courses (see list below) [2]		2
Two Thematic Depth Elective courses (see list below) [3]		2
One 300-level advanced seminar or practicum course (see list below)		1
ENST 411	Environmental Community Projects	1

1 GEOL 250 Geology for Engineers may be substituted with permission.
2 Integrative elective courses introduce major cross-disciplinary concepts and methods central to contemporary environmental studies.
3 Thematic depth courses explore environmental concepts and approaches from a wider range of disciplinary perspectives from across the University.

The ENST major includes five required courses and five elective courses. The five required courses are: ENST 201, ENST 208, ENST 302, ENST 411 and GEOL 203. ENST 201, ENST 302 and ENST 411 comprise the 'spine' sequence of the major designed to introduce students to the central concepts in environmental studies, environmental research and community-based applications. ENST 208 and GEOL 203 provide students with a foundation in the natural sciences.

The five electives include two "integrative" courses, two "thematic depth" courses, and one 300-level course. Integrative elective courses introduce major concepts and methods central to contemporary environmental studies. Thematic depth courses explore environmental concepts and approaches from a wider range of disciplinary perspectives from across the University; 300-level courses include seminar or practicum offerings that emphasize advanced concepts and content reflected, for example, in research projects and field-based activities.

Students should note that ENST 100 Introduction to Environmental Studies does not count toward the major or the minor in environmental studies.

The department has identified 10 integrative themes drawing on different cross-disciplinary domains in environmental studies and areas of strength at Bucknell. Environmental studies majors are expected to work closely with their academic advisers to develop a course of study oriented around one of these integrative themes or to develop a coherent self-designed course of study. Students are encouraged to consult with any faculty member in the department for more details about the integrative themes, including the selection of elective courses that align well with each area of study.

Integrative Themes:

- Environmental Change & Conservation
- Environmental History
- Environmental Policy, Politics & Governance
- Environmental Philosophy & Ethics
- Environmental Justice & Political Ecology
- Place, Nature & Community
- Environmental Planning & Sustainable Design
- Environmental Advocacy
- Critical Sustainability Studies
- Environmental Literature & Creative Writing

Integrative Elective Courses

ENST 207	American Environmental History (or ENST/HIST 213 North American Environmental History)	1
ENST/ANTH 210	Environmental Ethnography	1
ENST 211	Environmental Pollution and Control	1
ENST/GEOG 215	Environmental Planning	1
ENST 221	Hazardous Waste and Society	1

ENST 232	Identity, Inequality, and the Environment	1
ENST/GEOG 234	Human Ecology	1
ENST 236/RELI 226	Environmental Ethics	1
ENST/GEOG 240	Sustaining Nature	1
ENST 241	Environmental Health & Climate	1
ENST 245/POLS 291	Environmental Politics, Policy, & Justice	1
ENST 246	Environmental Activism	1
ENST 251	Environmental Issues in Indigenous Places	1
ENST 255	Environmental Injustice and Activism	1
ENST 254	Environmental Humanities	1
ENST 286	Imagining Sustainability	1

Thematic Depth Elective Courses

Thematic depth electives can be any ENST course as well as approved courses from other departments, including offerings listed under introductory courses (except ENST 100), integrative electives, and 300-level advanced seminar and practicum courses.

ENST 209/ANTH 202/LAMS 202	Rainforests and Eco-Politics in Latin America	1
ENST 212/UNIV 215	Stream Ecology and Restoration: The Science Behind Fly Fishing	1
ENST 214/GEOG 206/HIST 215	Mapping History: Nature, Place, and Power	1
ENST 216/CLAS 220	Preindustrial Environment	1
ENST 222	Concepts in Sustainability	1
ENST 226	Water & Power	1
ENST 227/ENCW 240	Ecopoetics	1
ENST/GEOG 235	Marine Environment	1
ENST 237	Oceans and Society	1
ENST 256	The Political Ecology of Extraction	1
ENST/CBST 263	Conservation in Africa	1
ENST 295	Topics in Environmental Studies	1
ENST 2NT	ENST Non-traditional Study	1-3
ENST 347/CEEG 447	Sustainable Cities (Bucknell in London only)	1
ANTH 260	Environmental Anthropology	1
CEEG 432	Sustainable Transportation Planning	1
ECON 231	Economics of Climate Change	1
ENCW 230	Topics: Writing Nature	1
ENCW 231	Environmental Writing	1
ENCW 233	Writing the Anthropocene	1
ENCW 241	Topics: Poetry, Mind, Nature	1
GEOG 204	Applied G.I.S. (or GEOL 230 Environmental GIS)	1
GEOG 257	Climate Change	1
GEOL 305	Introduction to Geochemistry	1
GEOL 316	Geomorphology	1
SOCI 220	Environmental Sociology	1
UNIV 200	Integrated Perspectives Course (Climate Change/The Anthropocene/River Tales) [1]	1

[1] Students interested in these UNIV courses should consult with their ENST adviser prior to course registration. For UNIV courses, instructors and topics can vary from year to year. For a UNIV course to count as a thematic depth elective for the ENST major, it is critical that students and advisers confirm that the particular UNIV course is one of the three above.

300-level Advanced Seminar (S) & Practicum (P) Courses

ENST 303	Diversity in the Great Outdoors	1
ENST 305	Gender, Environment & Health	1
ENST 315	Cold Places (S)	1
ENST 319	Directed Research (P)	.5-1

ENST 320/ANTH 307/LING 320	Language & Environmental Politics (S)	1
ENST/GEOG 325	Nature, Wealth and Power (S)	1
ENST/GEOG 345	Food and the Environment (S)	1
ENST 349	Senior Thesis (P)	.5-1
ENST 350	Senior Thesis (P)	.5-1
ENST/BIOL 353	Ecosystem Ecology (S)	1
ENST 355	Advanced Topics in Environmental Policy (S)	1
ENST/IREL/POLS 356	Nationalism, Nature & the Future (S)	1
ENST/POLS/RUSS 357	Petroleum Putinism & Plutonium	1
ENST 3NT	ENST Non-traditional Study (P)	1-3
HIST 301	Environmental History (S)	1

Bachelor of Arts in Environmental Science

The B.A. in Environmental Science is only available as a second major to students who major in biology, chemistry or geology, and therefore may be thought of as a means of adding an environmental concentration to a B.A. science degree. These three disciplines form the core of environmental science, and consequently, the first major ensures that students have sufficient depth of knowledge in a particular area of environmental science. Complementing the depth a student receives from the biology, chemistry or geology major, the B.A. in Environmental Science provides breadth across the interdisciplinary field of environmental science. The major is not intended as – nor can it be declared as – a stand-alone course of study. No courses may be counted for both majors.

The B.A. in Environmental Science requires eight courses distributed as follows:

ENST 201	Environmental Problems-Sustainable Futures	1
Select two of the following: [4]		2
BIOL 203	Integrated Concepts in Biology Fall	
or BIOL 204	Integrated Concepts in Biology Spring	
CHEM 205	Principles of Chemistry	
GEOL 203	Physical/Environmental Geology	
Select one integrative elective (except ENST 221, ENST 234), see list above.		1
Three science or engineering courses (see environmental science list below) one of which can come from Thematic Depth Elective Courses [5]		3
ENST 411	Environmental Community Projects [6]	1

4 From the disciplines within the environmental sciences, but outside the student's primary major.

5 These may not be from the same department as the student's primary major. Other courses not included in the regular catalog offerings (e.g. special topics courses) may be counted with permission.

6 Fulfills the Culminating Experience requirement. In this senior "clinic" course, students apply research methods and the broad perspectives gained in ENST courses in a group setting to a local environmental issue, thus culminating the major experience. Students will receive instruction in the other in-major components of the CASCC (writing, speaking and information literacy) as part of their major coursework.

List of Environmental Science Courses

ANBE/BIOL 314	Amphibian Biology and Conservation	1
ANBE/BIOL 382	Mass Extinctions	1
BIOL 203	Integrated Concepts in Biology Fall	1
BIOL 204	Integrated Concepts in Biology Spring	1
BIOL 266	Animal Behavior	1
BIOL 305	Vertebrate Ecology- with Lab	1
BIOL 312	Comparative Vertebrate Anatomy [7]	1
BIOL 313	Mammalogy [7]	1
BIOL 318	Principles of Physiology [7]	1
BIOL 321	Behavioral Ecology	1
BIOL 334	Limnology	1
BIOL 341	Evolution	1
BIOL 353	Ecosystem Ecology	1
BIOL 354	Tropical Ecology	1
BIOL 355	Social Insects	1

BIOL 357	Ornithology [7]	1
BIOL 358	Invertebrate Zoology [7]	1
BIOL 367	Plant Ecophysiology	1
BIOL 370	Primatology	1
CEEG 320	Water Resources Engineering	1
CEEG 340	Environmental Engineering	1
CEEG 421	Hydrology	1
CHEG 455	Atmospheric Chemistry and Physics [7]	1
CHEM 360	Advanced Environmental Chemistry [7]	1
ENST 211	Environmental Pollution and Control	1
ENST 221	Hazardous Waste and Society	1
ENST 234	Human Ecology	1
ENST 349 & ENST 350	Senior Thesis and Senior Thesis	1-2
GEOG 204	Applied G.I.S.	1
GEOG 205	Remote Sensing	1
GEOG/ENST 234	Human Ecology	1
GEOG 257	Climate Change	1
GEOL 117	Environmental Geohazards	1
GEOL 230	Environmental GIS	1
GEOL 304	Crystallography-Mineralogy	1
GEOL 305	Introduction to Geochemistry	1
GEOL 316	Geomorphology	1
GEOL 317	Paleontology	1
GEOL 334	Geophysics	1
GEOL 336	Hydrogeology	1
GEOL 338	Applied Environmental Geomorphology	1

[7] Additional coursework beyond the introductory course may be necessary as a prerequisite.

Minor in Environmental Studies

The minor in environmental studies requires five courses distributed across the three areas listed below. The following courses **do not** count toward the minor in environmental studies: ENST 100, ENST 201, ENST 208, ENST 302 and ENST 411.

1. Select at least one of the following natural science and environmental engineering courses

BIOL 203	Integrated Concepts in Biology Fall	1
or BIOL 204	Integrated Concepts in Biology Spring	
ENST/GEOG 113	Human Impact on Environment	1
ENST 211	Environmental Pollution and Control	1
ENST 212/UNIV 215	Stream Ecology and Restoration: The Science Behind Fly Fishing	1
ENST 221	Hazardous Waste and Society	1
ENST/GEOG 234	Human Ecology	1
ENST/GEOG 345	Food and the Environment	1
GEOL 203	Physical/Environmental Geology	1

2. Select at least one of the following "integrative" courses[1]

ENST 207	American Environmental History	1
ENST/GEOG 215	Environmental Planning	1
ENST 232	Identity, Inequality, and the Environment	1
ENST 236	Environmental Ethics	1
ENST/GEOG 240	Sustaining Nature	1
ENST 241	Environmental Health & Climate	1
ENST 245/POLS 291	Environmental Politics, Policy, & Justice	1

ENST 246	Environmental Activism	1
ENST 251	Environmental Issues in Indigenous Places	1
ENST 254	Environmental Humanities	1
ENST 255	Environmental Injustice and Activism	1
ENST 286	Imagining Sustainability	1

[1] Integrative courses introduce major concepts and methods central to contemporary environmental studies.

3. Select three elective courses

Electives may be any ENST course as well as approved courses from other departments, including those in Lists 1 and 2 above.

ANTH 260	Environmental Anthropology	1
CEEG 432	Sustainable Transportation Planning	1
ECON 231	Economics of Climate Change	1
ENCW 230	Topics: Writing Nature	1
ENCW 231	Environmental Writing	1
ENCW 233	Writing the Anthropocene	1
ENCW 241	Topics: Poetry, Mind, Nature	1
ENST 209/LAMS 202/ANTH 202	Rainforests and Eco-Politics in Latin America	1
ENST 214/HIST 215/GEOG 206	Mapping History: Nature, Place, and Power	1
ENST 216/CLAS 220	Preindustrial Environment	1
ENST 222	Concepts in Sustainability	1
ENST 226	Water & Power	1
ENST 227	Ecopoetics	1
ENST/GEOG 235	Marine Environment	1
ENST 256	The Political Ecology of Extraction	1
ENST/CBST 263	Conservation in Africa	1
ENST 295	Topics in Environmental Studies	1
ENST 2NT	ENST Non-traditional Study	1-3
ENST 315	Cold Places	1
ENST 319	Directed Research	.5-1
ENST 320/ANTH 307/LING 320	Language & Environmental Politics	1
ENST/GEOG 325	Nature, Wealth and Power	1
ENST 347/CEEG 447	Sustainable Cities	1
ENST 349	Senior Thesis	.5-1
ENST 350	Senior Thesis	.5-1
ENST/BIOL 353	Ecosystem Ecology	1
ENST 355	Advanced Topics in Environmental Policy	1
ENST/IREL/POLS 356	Nationalism, Nature & the Future	1
ENST 3NT	ENST Non-traditional Study	1-3
GEOG 204	Applied G.I.S.	1
GEOG 257	Climate Change	1
GEOL 305	Introduction to Geochemistry	1
GEOL 316	Geomorphology	1
HIST 301	Environmental History	1
UNIV 200	Integrated Perspectives Course (Climate Change)	1

Departmental Learning Objectives

Students completing the Bachelor of Arts degree in Environmental Studies will be able to:

Understand fundamental physical and biological principles that govern natural processes. (4, 6)

Understand fundamental concepts from the social sciences and the humanities underlying environmental thought and governance. (3, 4)

Integrate and apply perspectives from across the natural sciences, social sciences and the humanities in the context of complex environmental problems. (2, 3, 5)

Communicate integrated perspectives on complex environmental problems in the form of written and oral argument to both professional and lay audiences. (7, 8, 9)

Design and conduct independent research that contributes to environmental thought and/or problem solving. (4, 6)

Students completing the Bachelor of Arts degree in Environmental Science will be able to:

Demonstrate an in-depth understanding of one of the subdisciplines within environmental science (*i.e.* biology, chemistry or geology). (1, 4, 6)

Collect and interpret scientific data in both field and laboratory settings. (6)

Integrate information from across the scientific disciplines and apply these concepts to complex environmental problems. (2)

Identify the complex relationships between scientific approaches to environmental issues and political, social, economic and ethical perspectives on the environment. (3, 4, 5)

Communicate scientific information to both professional and lay audiences. (7, 8, 9)

Non-majors in Environmental Studies will be able to:

Demonstrate an understanding of current environmental challenges.

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

ENST 100. Introduction to Environmental Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of environmental issues intended for non-majors. Students will understand the cultural, political, historical, economic and ethical complexities of environmental problems and their responses. Intended for first-year students and sophomores. Does not count toward either the Environmental Studies or Environmental Science major.

ENST 113. Human Impact on Environment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Causes and effects of major environmental changes induced by humans, challenges to our future well-being, and opportunities for future sustainability. Prerequisite: open to first-year students only. Crosslisted as GEOG 113.

ENST 125. Environmental Sustainability Through the London Lens. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will help students to understand their personal connection to the environment through the analysis of environmental systems and cultural narratives that shape our relationship with the environment using London as our classroom. Numerous field trips to sights in and around London will be an important feature.

ENST 201. Environmental Problems-Sustainable Futures. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Develops a working understanding of the core concepts linked to ENST introduces skills such as posing researchable questions, gathering data, presenting oral arguments, applying these skills in group projects. For 1st 2nd yr. students majoring/intending to major in ENST or ENSC. Jr Sr by permission.

ENST 207. American Environmental History. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course examines how nature (soil, disease, water, climate, etc.) shaped American history and how Americans transformed the environment, from the colonial period to today.

ENST 208. Environmental Biology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
Introduction to ecology and evolutionary biology, organism interactions with environment, biodiversity, energy flow, and nutrient cycling, with emphasis on human influences on living systems and applications of evolutionary biology and ecology to solving environmental problems. This course is intended primarily for students majoring in environmental studies.

ENST 209. Rainforests and Eco-Politics in Latin America. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
We study how business interests, scientists, and indigenous peoples think and engage with rainforests in radically different ways. Attentive to these differences, the course explores how rainforests are being destroyed by some groups and protected by others. Crosslisted as ANTH 202 and LAMS 202.

ENST 210. Environmental Ethnography. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores environmental issues from around the world through scholarly readings in environmental anthropology. Students will also examine and practice the ethnographic methods that qualitative social scientists use to understand environmental phenomena. Not open to first-year students. Crosslisted as ANTH 210.

ENST 211. Environmental Pollution and Control. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Lab:2
Introduction for non-engineering students to the major areas of environmental engineering. Topics include environmental chemistry, biology and ecology, water and air pollution and treatment, solid and hazardous wastes, sustainability, and global climate issues. Not open to students who have taken CEEG 340.

ENST 212. Stream Ecology and Restoration: The Science Behind Fly Fishing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
Introduction to the interactions between water quality, hydrology, and aquatic ecosystems and their impact on stream ecosystem health. Stream restoration concepts will be studied including impacts of climate change, invasive species and land use. Fly fishing will be used as the common thread that ties these topics together. Crosslisted as UNIV 215.

ENST 214. Mapping History: Nature, Place, and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines maps as markers of environmental history. Focusing on the North Atlantic and North America from the seventeenth century onward, the course will emphasize critical analysis of visual artifacts, the politics of cartography, and maps as records of our changing ideas about and impact on the natural world. Crosslisted as GEOG 206 and HIST 215.

ENST 215. Environmental Planning. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Explores the main approaches to planning theory and their environmental applications. Considers how environmental planning can promote the socio-ecological health and sustainability of democratic communities. Crosslisted as GEOG 215.

ENST 216. Preindustrial Environment. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An introduction to global environmental history of the preindustrial world through three thematic lenses: how the natural environment shaped patterns of human life, how ideologies toward nature shifted over time, and how human activities and ideologies reshaped the ancient landscape. Crosslisted as CLAS 220.

ENST 221. Hazardous Waste and Society. 1 Credit.
Offered Occasionally; Lecture hours:3,Lab:2
Hazardous waste regulation, risk assessment and toxicology, overview of treatment technologies and site investigation, environmental audits, facilities siting and public participation, pollution prevention. Not open to engineering students, and also not open to students who have taken CEEG 444.

ENST 222. Concepts in Sustainability. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3,Other:2
This course explores the definitions and concepts of economic, social and environmental sustainability and utilizes the tools to evaluate sustainability metrics including life cycle assessment, systems thinking, and economic analysis. Not open to engineering students.

ENST 226. Water & Power. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course explores social, political, and economic power of water, and the water-energy relationship. We will consider historical cases around the world, shifting and competing philosophical approaches to water use, as well as the complex politics surrounding current water issues.

ENST 227. Ecopoetics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
An exploration of poetry as site-specific ecological practice. Intended for students interested in both Creative Writing and Environmental Studies. Prerequisite: permission of the instructor. Crosslisted as ENCW 240.

ENST 232. Identity, Inequality, and the Environment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
With a focus on race, ethnicity, class, and gender, this course examines environmental issues from around the globe. Students will learn how issues of identity and inequality are central to environmental problems and solutions. Topics include colonization, toxicity and health, climate change, grassroots environmentalism, and environmental leadership.

ENST 234. Human Ecology. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
A general science course in human ecology, to demonstrate the ways humans continue to adapt to their environment through biological, cultural, scientific, symbolic, political, and technical means. Crosslisted as GEOG 234.

ENST 235. Marine Environment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Understanding the ecological and physical systems of the ocean, understanding the processes of scientific discovery in the ocean, and exploring the many interactions of humans with ocean systems. Crosslisted as GEOG 235.

ENST 236. Environmental Ethics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of the major theories of environmental ethics, with particular attention to the challenge of developing an ethic commensurate with increasing human power. Crosslisted as RELI 226.

ENST 237. Oceans and Society. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this class we will uncover the many ways in which human societies are inextricable from the world's oceans and address themes such as scientific uncertainty, environmental racism, immigration, colonialism and urban sustainability. Walruses, anchovies, artisanal fishers, coastal cities and factories will all lie at the center of weekly discussions. Crosslisted as SOCI 227.

ENST 240. Sustaining Nature. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Critically explores contemporary and historical processes of human manipulation and conservation of nature. How do humans consume, transform, protect, and restore nature globally in relation to interrelated crises of inequality, biodiversity loss and climate change? Crosslisted as GEOG 240.

ENST 241. Environmental Health & Climate. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the connection between human-induced climate change, environmental exposures and health. We will situate climate/environmentally related health problems within social contexts by attending to everyday biological, physical and chemical agents of the environment. Crosslisted as GEOG 241.

ENST 245. Environmental Politics, Policy, & Justice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to understanding the role of political institutions, stakeholders and policy processes (in the U.S. and internationally) in addressing environmental problems. Crosslisted as POLS 291.

ENST 246. Environmental Activism. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course explores the geographies and practice of environmental activism. Drawing from national and international examples, we examine diverse means and methods of environmental protest.

ENST 251. Environmental Issues in Indigenous Places. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the values, politics and power relations that allow for the exploitation and conservation of nature in specific geographies. We will explore environmental and social justice issues emerging from such practices in Indigenous geographies and their intersection with those in Black and other minoritized geographies across the globe. Crosslisted as GEOG 251.

ENST 254. Environmental Humanities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores humanistic perspectives on the environment--from history, ethics, literature, religion, and the arts--including how these perspectives complement or unsettle knowledge about nature from the sciences.

ENST 255. Environmental Injustice and Activism. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Explores environmental injustice in United States and internationally. Includes discussion of: structural racism, class issues, ecological justice, morality and environmental policy, and the environmental justice movement.

ENST 256. The Political Ecology of Extraction. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Using a political ecology framework, this course explores politics of mining and fossil fuel extraction around the world to meet global energy and mineral demand. We will study the connection between mining and climate change politics and many examples of resistance to extractivism.

ENST 263. Conservation in Africa. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Through a series of case studies and a final research project, students will gain in-depth knowledge of conservation efforts on the African continent. Emphasizing local and global contexts, course themes include the colonial origins of protected areas, African environmental activists and scholars, and the multiple methods used in political ecology. Crosslisted as CBST 263.

ENST 278. World Literature and Environmental Justice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines how writers from outside of Europe and the United States seek environmental justice through a range of literary forms. Crosslisted as ENLS 278.

ENST 286. Imagining Sustainability. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course covers critical understandings and applications of sustainability across the humanities, the social sciences, and the natural sciences as integrative of environmental, social, economic, and cultural perspectives.

ENST 295. Topics in Environmental Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected issues in environmental studies.

ENST 2NT. ENST Non-traditional Study. 1-3 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in Environmental Science. Prerequisite: permission of the instructor.

ENST 302. Community-Based Research Design. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:1
Students will learn quantitative and qualitative research methods related to environmental studies including research design, data collection, and analysis. Prerequisite: junior or senior status. Preference to Environmental Studies majors, others by permission of the instructor.

ENST 303. Diversity in the Great Outdoors. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The great outdoors is for everyone, right? Perhaps it should be, but outdoor recreation has not always been so inviting to all. Through films, field trips, readings, speakers and projects, this course will challenge students to grapple with the complex intersection of social justice and environmental relationships in outdoor recreation.

ENST 305. Gender, Environment & Health. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores how gender (intersecting with other identities) shapes interactions with the environment and related health outcomes. We will attend to multiple forms of power structures that enable and constrain possibilities of well-being. Crosslisted as GEOG 305 and WMST 305.

ENST 315. Cold Places. 1 Credit.
Offered Occasionally; Lecture hours:3
A seminar exploring the nature and culture of cold places -- glaciers, mountain tops, Antarctica, and the Arctic -- through art, film, literature, science, and popular media. Crosslisted as ENST 615.

ENST 319. Directed Research. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Supervised research or thesis work on environmental issues. Prerequisite: permission of the instructor.

ENST 320. Language & Environmental Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Communication is central to how people perceive the environment, understand their relationship to it, and organize actions to change it. This course draws on concepts from linguistic anthropology, including discourse analysis, to examine debates about wildlife conservation, clean energy, eco-friendly products, environmental rights, and climate change. Crosslisted as ANTH 307 and LING 320.

ENST 325. Nature, Wealth and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A seminar in political ecology that explores the historical, social political and economic dimensions of environmental change in developing regions. First-year students and sophomores by permission only. Prerequisite: permission of the instructor. Crosslisted as GEOG 325.

ENST 345. Food and the Environment. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Nothing from the environment is more important than food production, nothing affects the environment more; we'll study both environmental and social circumstances. Crosslisted as GEOG 345.

ENST 347. Sustainable Cities. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:2
This team-taught course introduces students to the core concepts of sustainability and how they have been applied to promote sustainability in London, the UK, and Europe. This course is part of the Bucknell in London core course. Prerequisite: permission of the instructor. Crosslisted as CEEG 447.

ENST 349. Senior Thesis. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Independent thesis work under adviser's supervision. Prerequisite: permission of the instructor.

ENST 350. Senior Thesis. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Independent thesis work under adviser's supervision. Prerequisite: permission of the instructor.

ENST 353. Ecosystem Ecology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Interactions between organisms and the physical and chemical environment including nutrient cycling and energy flow, biogeochemistry, and temporal and spatial dynamics of ecosystems. Prerequisites: ENST 208, junior or senior status, and permission of the instructor. Crosslisted as ANBE 353, ANBE 653, BIOL 353, BIOL 653.

ENST 355. Advanced Topics in Environmental Policy. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Advanced seminar on environmental policy. Focus varies by semester. Consult class schedule for current topic. Prerequisite: permission of the instructor. Crosslisted as POLS 393.

ENST 356. Nationalism, Nature & the Future. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores: the politics and geographies of nationalism; how nature is nationalized; the various ways ethnocentrism, racism, and sexism become part of national identity construction; ideas about and representations of nature in environmental contestations and in reactions to nationalism; and the intersection of nationalism with other social constructions. Crosslisted as IREL 356 and POLS 356.

ENST 357. Petroleum Putinism & Plutonium. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the role of nationalism, alongside ideas about energy and nature, in the Russian state's current historical colonial relationships with neighboring countries, Central Asia and Indigenous communities of Siberia. Topics include Russian imperial/Soviet state extractivist economics, Russian/regional pipeline and petro politics, social resistance and climate change futures. Crosslisted as POLS 357 and RUSS 357.

ENST 3NT. ENST Non-traditional Study. 1-3 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in Environmental Science. Prerequisite: permission of the instructor.

ENST 411. Environmental Community Projects. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Community-based "clinic" course on environmental problems or projects for local stakeholders, based on integrative, interdisciplinary research and design. Preference to senior ENST, ENSC, and GEOG majors.

Food Systems Minor

Faculty

Coordinator: Clare Sammells

Coordinating Committee: John Penniman (Religious Studies), Clare Sammells (Sociology & Anthropology), Mark D. Spiro (Biology), Katie Tardio (Classics & Mediterranean Studies), Margot Vigeant (Chemical Engineering)

The minor in food systems takes an interdisciplinary approach to the study of the production, processing, distribution and politics of food, which are global challenges in the 21st century. The minor offers cultural, political, economic, environmental, scientific and geographic approaches that allow students to investigate the myriad ways in which individuals and societies produce, distribute, consume, understand and experience food.

The food systems minor covers topics such as food policies, nutrition, water, waste and the urban environment, ethics of consumption, local and global cuisines, cultural practices, and the aesthetics of dining. By exploring these issues with analytic tools developed in a range of academic disciplines, this minor leads to a critical examination of the role of food in historic and contemporary societies. A food systems minor enriches students' understanding of their respective majors and will prove useful to careers in a variety of fields, including agricultural sciences, policy, development, advocacy, media, and social and cultural analysis.

The food systems minor consists of five courses. At least two courses must come from the "Global Cultural Approaches" list; at least one must come from the "Applied Approaches" list; the other two may be from either list. No more than three courses may be from the same department. Only one 100-level course may count toward the minor. Please note that courses in a student's major department may not count toward their minor requirements.

Students or faculty instructors may request that relevant courses, including study abroad courses, be counted toward the minor by contacting the chair of the Coordinating Committee. Students may also count relevant internships or fieldwork experiences in the form of an independent study course. Students are encouraged to discuss their selection of courses for the minor with a member of the Coordinating Committee.

Global Cultural Approaches to Food Systems

ANTH 265	Food, Eating, and Culture	1
ANTH 310	Culture, Nature and Place	1
CLAS 255	Archaeology of Food	1
ENST 216	Preindustrial Environment	1
ENST 226	Water & Power	1

ENST 255	Environmental Injustice and Activism	1
FREN 282	Patrimoines gastronomiques	1
FREN 395	Seminar in French or Francophone Studies (when topic is food-related)	1
GEOG 345	Food and the Environment	1
PSYC 309	Appetite and Eating Behavior	1
RELI 312	Digesting Divinity: Religion, Food and Diet	1
RESC 220	Residential College Dinner Seminar (Food College)	.25
RESC 221	Residential College Dinner Seminar (Food College)	.25
SOCI 220	Environmental Sociology	1
SOCI 227	Oceans and Society	1
SPAN 361	Topics in Hispanic Literature ("Spain: Food, Futbol and Fiction")	1
UNIV 192	Food, Faith, Justice: Baltimore	.5
UNIV 200	Integrated Perspectives Course ("West, Cowboys, Nature, Myth")	1

Applied Approaches to Food Systems

BIOL 150	Plants, People, and the Environment	1
BIOL 351	Field Botany	1
CEEG 320	Water Resources Engineering	1
CHEG 242	Introduction to Food Science and Engineering for non-majors	1
CHEG 442	Food Science & Technology	1
CHEG 452	Bioprocess Engineering	1
CHEM 332	Instrumental Analysis (with Prof. Doug Collins)	1
CHEG 458	Fermentation Processes	1
CHEM 332L	Lab-Instrumental Analysis (with Prof. Doug Collins)	0
ECON 235	African Economic Development	1
FOUN 098	Foundation Seminar ("Sustainable Energy, Food & Lifestyle")	1
RESC 098	Foundation Seminar in Residential Colleges ("Food, Farming and Sustainability")	1
UNIV 200	Integrated Perspectives Course ("Farm to Table" and "Transforming Food")	1
UNIV 205	Confounding Problems ("Food, Faith, Justice: Baltimore")	.25-.5
UNIV 209	Tasting France: The Science and Culture of Terroir	1

Foundation Seminar

Each first-year student at the University enrolls in a small, writing-intensive seminar of about 16 students in the fall semester. Foundation seminars (FOUN or RESC) are offered by many different faculty and focus on a wide variety of subjects. Seminars with the RESC designation are linked to a residential college, a living-learning community. For more information, see bucknell.edu/ResColleges (http://www.bucknell.edu/ResColleges/).

Whatever the topic, Foundation Seminars are designed to cultivate the attitudes, skills and knowledge necessary for students to benefit maximally from a Bucknell University education and to negotiate the complexities of the modern world. The seminars stress active, independent and engaged learning, and development of skills students need to engage in intellectual endeavors at Bucknell and beyond. All foundation seminars are writing-intensive (W1) courses. For more information, see Writing Program (p. 441).

Courses

FOUN 098. Foundation Seminar. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A small writing-intensive first-year seminar. Also see RESC 098.

Geography

Faculty

Professor: Adrian N. Mulligan (Interim Chair)

Associate Professors: Duane A. Griffin, Vanessa A. Massaro

Assistant Professors: Janet Adomako, Ritwika Biswas, Joseph Odura Appiah

Visiting Assistant Professor: Jenna Christian

Geographers are devoted to thinking spatially about people, environments and relations among them. Human geography focuses on the cultural/social, economic and political processes that create and reproduce the built environments and social worlds in which we live. Environmental geography lies at the intersection of the physical and human worlds, studying topics such as resources, hazards and environmental impacts. Physical geography, a natural science, focuses on the natural processes that interact to create the biophysical environments we depend upon. What links these disparate foci is an overriding concern with *space* and the various ways in which it matters.

Geography courses promote a fuller understanding of the world in which we live by connecting our immediate, local surroundings to the global, where students develop critical thinking as well as contextual analysis skills, problem-solving, writing, researching, mapping, public speaking, information literacy and teamwork abilities. Students are also exposed to a range of methods from ethnography and archival research, to field and laboratory work; and using technologies such as Geographic Information Systems and Remote Sensing, thereby developing strong research and technical skills.

The geography major at Bucknell provides a strong background in the discipline while building a substantial foundation for a liberal arts education. Geography's inherently interdisciplinary nature complements and integrates material from related fields, such as environmental studies, international relations, economics, history, women's & gender studies, political science, geology, anthropology, sociology, climatology, philosophy and biology, making it an ideal choice for dual majors or as a minor. The geography major (or minor) provides strong preparation for careers or graduate study in the environmental and resource fields, international affairs, urban and regional planning, non-profits, government, business and marketing, journalism, law, health care, public service, teaching and a host of other fields.

Geography Major

The **major** in geography consists of a minimum of EIGHT courses which must include:

Two 200-level Human Geography courses (social science credit)		2
Two Environmental Geography courses (natural science credit) [1]		2
GEOG 204	Applied G.I.S.	1
Culminating Experience [2]		1
Two Geography electives [3]		2

1. This includes courses centered on the physical environment and human-environment relations. Some courses in other departments are accepted toward the major with geography department approval, for example geology, biology, and environmental studies & sciences.
2. Taken senior year (or second semester junior year with adviser and departmental approval). Courses fulfilling this requirement include 300-level or higher (non-methods/skills) geography courses or an independent study course designed for this purpose. In these courses, paper and/or project topics for the geography majors will be designed to ensure that the students draw upon their broader geographic education, thus providing them a more coherent appreciation of the discipline.
3. May be any 200-level or higher geography course, but may include up to two 100-level geography courses taken before declaring the major.

Geography Minor

The geography **minor** consists of five geography courses, at least one of which is a geography science course, and no more than one of which may be at the 100 level.

Majors in Geography will be able to:

1. Understand human-environment relations and spatial relations as a dynamic involving the interplay of social change and environmental change. (1, 3, 4, 6, 7)
2. Apprehend their role, both individually and collectively, in changing human-environmental relations and spatial dimensions of society. (1, 3, 4, 5)
3. Use space and spatial relations to understand society at different scales. (1, 3, 4)
4. Understand academic geographical study as providing a systematic framework for examining environmental and social problems. (1, 3, 4)
5. Engage in high-order, independent thinking, integrating spatial and human-environment relations into their analysis of problems at scales ranging from the global to the local. (1, 3, 4, 6, 7)
6. Synthesize insights in human and physical geography with those from cognate disciplines in social and/or natural sciences. (1, 2, 3)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

GEOG 101. Globalization, People, and Place. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Investigates the world from a spatial perspective to understand the complexity of places and the dynamic relationship between peoples and the world they inhabit. Open to first-years and sophomores.

GEOG 113. Human Impact on Environment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Causes and effects of major environmental changes induced by humans, challenges to our future well-being, and opportunities for future sustainability. Prerequisite: open to first-year students only. Crosslisted as ENST 113.

GEOG 201. Special Topics in Geography. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3; Repeatable
Topics related to current events/issues in Geography.

GEOG 204. Applied G.I.S.. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to the use of Geographical Information Systems to collect, structure, and display large or complex spatial data sets, using examples from human and physical geography.

GEOG 205. Remote Sensing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to satellite data acquisition, processing and extraction of information to understand complex environmental, geological and biological phenomena as well as the interactions between these phenomena.

GEOG 206. Mapping History: Nature, Place, and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines maps as markers of environmental history. Focusing on the North Atlantic and North America from the seventeenth century onward, the course will emphasize critical analysis of visual artifacts, the politics of cartography, and maps as records of our changing ideas about and impact on the natural world. Crosslisted as ENST 214 and HIST 215.

GEOG 208. Latina Feminisms US. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines the various experiences, perspectives and expressions of Latinas in the United States, which vary according to gender, sexuality, race, citizenship, region and language. Crosslisted as LAMS 218 and WMST 218.

GEOG 209. Economic Geography. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Inquiry into local and global changes in economic activity, location and spatial organization, especially focusing on implications for the well-being of people in particular places. Crosslisted as ECON 209.

GEOG 211. Geopolitics & Political Geography. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Considers political processes from a geographical perspective across a range of scales, in particular analyzing the geographical arguments which shape international political relations.

GEOG 215. Environmental Planning. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Explores the main approaches to planning theory and their environmental applications. Considers how environmental planning can promote the socio-ecological health and sustainability of democratic communities. Crosslisted as ENST 215.

GEOG 216. Borders and Politics of Mobility. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the politics of contemporary nation state borders, issues of territory, sovereignty, mobility, migration, identity, citizenship, statelessness, and focuses on borders at other scales. Crosslisted as IREL 216.

GEOG 220. Cultural Geography. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Role of culture in shaping places. How cultures are geographically expressed, and how geography is a basic element in the constitution of cultures. Prerequisite: permission of the instructor.

GEOG 227. Geographies of Uneven Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course, we will build a critical understanding of the nature and processes of development in the global south countries while exploring the role of colonialism, imperialism and capitalism. Includes topics such as global political-economic change, population growth, human capital, microfinance, food politics and gender inequality. Crosslisted as ECON 217.

GEOG 234. Human Ecology. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
A general science course in human ecology, to demonstrate the ways humans continue to adapt to their environment through biological, cultural, scientific, symbolic, political, and technical means. Crosslisted as ENST 234.

GEOG 235. Marine Environment. 1 Credit.
Lecture hours:3
Understanding the ecological and physical systems of the ocean, understanding the processes of scientific discovery in the ocean, and exploring the many interactions that humans have with ocean systems. Crosslisted as ENST 235.

GEOG 239. Popular Music, Identity, and the Politics of Place. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course utilizes popular music as a means of thinking geographically about people and their connections to place, but also people's interconnections with different places over time. Through different case studies, students will also consider the power of popular music to transform place, to challenge and overcome social divisions.

GEOG 240. Sustaining Nature. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Critically explores contemporary and historical processes of human manipulation and conservation of nature. How do humans consume, transform, protect, and restore nature globally in relation to interrelated crises of inequality, biodiversity loss and climate change? Crosslisted as ENST 240.

GEOG 241. Environmental Health & Climate. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the connection between human-induced climate change, environmental exposures, and health. We will situate climate/environmentally related health problems within social contexts by attending to everyday biological, physical, and chemical agents of the environment. Crosslisted as ENST 241.

GEOG 243. Placing the Past. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Through the integration and utilization of geographical and historical thinking, this course encourages students to explore forgotten, marginalized, and occluded moments in place and time, from the perspective of considering their potential significance and usefulness in the contemporary period. Crosslisted as HIST 243 and UNIV 243.

GEOG 251. Environmental Issues in Indigenous Places. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the values, politics and power relations that allow for the exploitation and conservation of nature in specific geographies. We will explore environmental and social justice issues emerging from such practices in Indigenous geographies and their intersection with those in Black and other minoritized geographies across the globe. Crosslisted as ENST 251.

GEOG 257. Climate Change. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Understanding, the global climate system, how it has changed in the past, how it is changing now in response to human activities, predicted future changes, and our options for mitigating and adapting to them.

GEOG 258. The Human Planet. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
How humanity became an environmental force dictating the future of life on Earth and implications of that fact for individual and societal choices and actions, and the future prospects for humanity and our fellow species in an Anthropocene world.

GEOG 301. Topics in Advanced Physical Geography. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:4
Specialized topics in physical geography. Prerequisite: permission of the instructor.

GEOG 305. Gender, Environment & Health. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores how gender (intersecting with other identities) shapes interactions with the environment and related health outcomes. We will attend to multiple forms of power structures that enable and constrain possibilities of well-being. Crosslisted as ENST 305 and WMST 305.

GEOG 306. Geographies of Infrastructure. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will examine how infrastructure is used as a tool to structure everyday life in highly uneven ways in varied social settings across the globe. The way infrastructure is planned and organized reflects upon the hierarchical power relations embedded in a place which we will uncover and challenge.

GEOG 308. Topics in Advanced Environmental Geography. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Specialized topics in environmental geography.

GEOG 309. Topics in Advanced Economic Geography. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Specialized topics in economic geography.

GEOG 316. Geographies of Nationalism. 1 Credit.
Lecture hours:3
The course explores nationalism and its increasing popularity by considering it geographically; for example, its dynamic scalar dimensions, its forging of race and gender spatially, and its naturalization in landscape and built form. In so doing, we will critically consider those interests that nationalism serves. Crosslisted as WMST 316.

GEOG 317. Carceral Landscapes: Understanding Geographies of Punishment, Policing and Detention. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will examine how power systems of control and confinement reverberate to reshape society and space. This course will investigate the cultural landscape produced by drives to punish and confine populations, especially drives based on race, gender presentation, and citizenship status. Crosslisted as WMST 317.

GEOG 318. Geographies of Justice, Globalization and Sustainability. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Explores social, economic and environmental issues surrounding globalization and focuses on the role of space for questions of justice, sustainability and social change. Drawing on scholarship in geography and cognate disciplines, students examine how social structures privileging dominant groups produce spatial inequality and marginality across global North and South countries.

GEOG 319. Undergraduate Research. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Supervised research, readings, and/or preparation of a paper on some aspect of geography. Prerequisite: permission of the instructor.

GEOG 320. Undergraduate Research. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Supervised research, readings, and/or preparation of a paper on some aspect of geography. Prerequisite: permission of the instructor.

GEOG 321. Special Topics in Geography. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Development and growth of geographic thought; investigation, report and/or seminar on currently significant topics in geography. Prerequisite: permission of the instructor.

GEOG 322. Special Topics in Geography. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Development and growth of geographic thought; investigation, report and/or seminar on currently significant topics in geography. Prerequisite: permission of the instructor. Crosslisted as GEOG 622.

GEOG 324. Geographies of Identity. 1 Credit.
Offered Occasionally; Lecture hours:3
Who are "we"? Seminar considers role of space in constituting society around the world. Explores nationalism, globalization, multiculturalism, citizenship, race, ethnicity, gender, sexuality, age, disability. Prerequisite: first-year students by permission only. Crosslisted as WMST 324.

GEOG 325. Nature, Wealth and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A seminar in political ecology that explores the historical, social political and economic dimensions of environmental change in developing regions. First-year students and sophomores by permission only. Crosslisted as ENST 325.

GEOG 326. Thinking Space: Critical Reflections on Research. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
With an eye toward research design, proposal and grant writing, students will critically engage the role of the University in imagining, creating and understanding place. Students will think about space, how to study it, and, in turn, how studying space produces it.

GEOG 333. Knowing the Forest. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
An immersive field-based course focused on understanding the environment from multiple perspectives including the natural/social sciences, the arts and the humanities. Class sessions will take place outdoors in nearby forests.

GEOG 345. Food and the Environment. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Nothing from the environment is more important than food production, nothing affects the environment more; we'll study both environmental and social circumstances. Crosslisted as ENST 345.

GEOG 420. Environmental Community Projects. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Community-based "clinic" course on environmental problems or projects for local stakeholders, based on integrative, interdisciplinary research and design. Preference to senior ENST, ENSC, and GEOG majors.

Geology & Environmental Geosciences

Faculty

Professors: Christopher G. Daniel, Mary Beth Gray, Robert Jacob (Chair), Jeffrey M. Trop

Associate Professor: Ellen K. Herman

Assistant Professors: Ellen P. Chamberlin, Lorelei Curtin

Geology is the natural science that involves the nature and history of Earth, including scientific analysis of environmental problems. The Bucknell geology curriculum engages students with concepts and issues related to Earth and its environments through coursework, field studies and scientific research. A geology degree equips students with analytical skills, problem-solving skills, communication skills, experience in teamwork and solid grounding in field-based science. Geoscience includes diverse subdisciplines, for example natural hazards, natural resources, interactions between environmental materials, non-invasive exploration of earth, history of climate change, engineering geology, and tectonics. At an introductory level, geology coursework provides students with basic knowledge of Earth and its systems and how that knowledge can provide an understanding of potential solutions to environmental problems. Knowledge of Earth, its processes, hazards, history, resources and limitations can be an important component of a liberal arts education and can provide a foundation for advanced work in the discipline.

An undergraduate degree provides the foundation needed for employment or graduate degree specialization. In addition to gaining acceptance to some of the most prestigious graduate programs in the country, recent graduates secured employment in environmental or engineering consulting firms, governmental agencies, oil and gas companies, and educational institutions. Students also have used our courses toward certification as teachers in Earth and space sciences.

At Bucknell University, students majoring in geosciences in either Bachelor of Arts or Bachelor of Science degree programs are expected to take courses to explore the breadth of the science culminating with a common course (GEOL 450 Geosciences Futures). Majors will be introduced to the science by one of the 200-level lab courses and then diving deeper into the science by taking a series of 300-level lab courses that span the complex nature of the earth.

A Bachelor of Science track is appropriate for students who have decided to begin a career in geoscience or pursue a graduate degree in an environmental/economic geoscience profession. Students who elect a Bachelor of Arts track have greater curricular flexibility, allowing for a second major. Recent Bachelor of Arts graduates have attended graduate school or secured employment in geoscience, environmental science, environmental law or policy, education, business, medicine and science writing.

Bachelor of Arts Major in Geosciences

Requires nine GEOL courses and two additional courses (10.5 credits).

Select one of the following courses (1 credit):		
GEOL 203	Physical/Environmental Geology	1
or GEOL 204	Evolution of the Earth	
or GEOL 208	Surface Mapping & Subsurface Imaging	
or GEOL 250	Geology for Engineers	
Select seven GEOL courses 300 level or above with the exception of GEOL 318, GEOL 319, and GEOL 320 (7 credits):		7
GEOL 450	Geosciences Futures	.5
Additional two requirements for the major include (2 credits):		
MATH 201	Calculus I	1
or MATH 216	Statistics I	
PHYS 211	Classical and Modern Physics I	1
or CHEM 205	Principles of Chemistry	
or BIOL 203	Integrated Concepts in Biology Fall	
or BIOL 204	Integrated Concepts in Biology Spring	
BA students are encouraged to take a summer field course in the geosciences, to elect additional courses in science and mathematics, and to participate in independent study research opportunities through GEOL 318, GEOL 319, or GEOL 320.		
Total Credits		**10.5**

Bachelor of Science Major in Geosciences

Requires 11 GEOL courses, six additional courses (16.5 credits), and a supervised research experience.

Select one of the following approved 200-level courses (1.0 credit):		
GEOL 203	Physical/Environmental Geology	1

or GEOL 204	Evolution of the Earth	
or GEOL 208	Surface Mapping & Subsurface Imaging	
or GEOL 250	Geology for Engineers	
The following eight CORE courses are required (7.5 credits):		
GEOL 304	Crystallography-Mineralogy	1
GEOL 305	Introduction to Geochemistry	1
or GEOL 344	Paleoclimatology	
GEOL 309	Sedimentology and Stratigraphy	1
GEOL 314	Structural Geology	1
GEOL 316	Geomorphology	1
GEOL 334	Geophysics	1
GEOL 336	Hydrogeology	1
GEOL 450	Geosciences Futures	.5
Select two additional GEOL 300-level or above electives with the exception of GEOL 318, GEOL 319, or GEOL 320 (2 credits).		2
Additional six requirements for the major include (6 credits):		
GEOL 230	Environmental GIS	1
or GEOL 311	Landscapes in GIS	
or GEOG 204	Applied G.I.S.	
PHYS 211	Classical and Modern Physics I	1
CHEM 205	Principles of Chemistry	1
MATH 201	Calculus I	1
MATH 202	Calculus II	1
CHEM 230	Principles of Chemistry 2	1
or MATH 211	Calculus III	
or MATH 216	Statistics I	
or PHYS 212	Classical and Modern Physics II	
A summer course in field geology is recommended.		
BS students are also required to conduct supervised summer research OR 1 credit of supervised research (GEOL 318, GEOL 319, or GEOL 320) AND present their research in an approved forum.		
Total Credits		**16.5**

To satisfy the Supervised Research Experience, BS students plan and execute a research project supervised by a faculty member during their junior and/or senior year. The following steps and timing based on spring graduation are suggested:

1. Determine your research topic: You are encouraged to consult with multiple, potential faculty research advisers during the fall semester of your junior year and select a project in collaboration with at least one member of the department faculty preferably by the end of the fall semester of the junior year, and no later than the last day of class of the spring semester, junior year.
2. Propose your research project: In consultation with your research adviser, students will develop a written proposal summarizing the research objective, work plan and significance. The research proposal must be completed at a time agreed upon by the student and their research adviser, but no later than the fourth week of classes in the fall semester, senior year.
3. Conduct the research: Research projects are one-semester minimum duration during the academic year or eight weeks minimum duration during the summer. Research may be conducted off-campus under the supervision of an off-campus co-adviser. If the research takes place during the academic year, students must successfully complete GEOL 319 and/or GEOL 320.
4. Disseminate your results: Students must present the results of their work in an approved format by their research adviser and the department chair to successfully complete the Research Experience.

Below is the recommended sequence for the Bachelor of Science major.

First Year

First Semester	Credits	Second Semester	Credits
GEOL Course (approved 200-level)	1	GEOL Core Course	1
MATH 201	1	MATH 202	1
Elective	1	Elective	1

FOUN/RESC		1 Elective	1
		4	**4**

Sophomore

First Semester	Credits	Second Semester	Credits
GEOL Core Course	1	GEOL Core Course	1
GEOL Core Course	1	CHEM 205	1
GIS Course	1	IP	1
Elective	1	Elective	1
	4		**4**

Junior

First Semester	Credits	Second Semester	Credits
GEOL Core Course	1	GEOL Core Course	1
GEOL Core Course	1	CHEM, MATH, or PHYS	1
PHYS 211	1	Elective	1
Elective	1	Elective	1
	4		**4**

Senior

First Semester	Credits	Second Semester	Credits
GEOL 450	.5	GEOL Elective	1
GEOL Elective	1	Elective	1
Elective	1	Elective	1
Elective	1	Elective	1
Elective (0.5 cr)	.5		
	4		**4**

Total Credits: 32

Additional Notes

Independent supervised research experiences are strongly encouraged for all majors by the department. Research opportunities are available through summer research fellowships (e.g. P.U.R. and McKenna Environmental) or Undergraduate Research Courses (GEOL 318, GEOL 319 or GEOL 320).

The department encourages majors (either BA or BS) who are completing independent research experiences and who meet requirements to become candidates for Honors in geosciences. Honors is given to those students who are accepted to the University Honors Program and successfully complete and defend an honors thesis and research presentation in geosciences.

The department attempts to make it possible for students to enroll in study abroad programs. At times this involves changing sequences of recommended courses. Consultation with an academic adviser well in advance is essential.

Courses in all of our degree programs are designed to provide students with many opportunities to practice and develop their writing, speaking, and information literacy skills, consistent with the learning objectives of the College of Arts & Sciences Core Curriculum (CASCC).

Students in our department also satisfy the Culminating Experience component of the College of Arts & Science Core Curriculum (CASCC) by taking GEOL 450 Geosciences Futures, a required course for both B.S. and B.A. majors, in the fall of either their junior or senior year.

A geoscience major is also available in combination with a bachelor of science in engineering in a five-year program.

Students wishing to become certified as secondary school Earth Science teachers should consult with the Department of Education and the chair of the Geology & Environmental Geoscience Department to arrange a plan of study that ensures that all of the requirements for certification will be met.

Students may choose from three **minors** in the area of geoscience:

Geosciences Minor

Requires four courses.

GEOL 203	Physical/Environmental Geology	1
or GEOL 250	Geology for Engineers	
GEOL 204	Evolution of the Earth	1

Select two 300-level geology courses except GEOL 319, GEOL 320	2
Total Credits	**4**

Engineering Geology Minor

Requires four courses.

GEOL 250	Geology for Engineers	1
GEOL 314	Structural Geology	1
Select two 300-level geology courses except: GEOL 319, GEOL 320		2

Environmental Geosciences Minor

Requires four courses.

Select one of the following:		
GEOL 203	Physical/Environmental Geology	1
or GEOL 250	Geology for Engineers	
Select two of the following:		2
GEOL 305	Introduction to Geochemistry	
GEOL 316	Geomorphology	
GEOL 334	Geophysics	
GEOL 336	Hydrogeology	
GEOL 338	Applied Environmental Geomorphology	
Select one 200-level or 300-level geology course except: GEOL 319 or GEOL 320		1
Total Credits		**4**

Majors in Geosciences (B.A. and B.S.) will:

- Meet all of the expectations of students in introductory courses
- Understand core areas of geology and environmental geology, and interpret a wide range of earth processes on different temporal and spatial scales.
- Demonstrate competence in collecting scientific data, including field observation and field and analytical measurements.
- Demonstrate the skills of interpretive analysis and critical thinking with respect to geological problems involving temporal and spatial relationships.
- Make informed decisions on issues of local and global environmental significance based on an understanding of: 1) The interconnectedness of the natural sciences; 2) The linkages of processes and systems that characterize Earth systems; and 3) The interrelationships between humans and natural Earth systems.
- Conduct effective independent and collaborative investigations.
- Execute a formal research project, including the use of primary literature, development of a scientific proposal, collection of new primary data, interpretation of new data, and dissemination of results (B.S. majors only).

Non-majors in Geosciences (meeting laboratory science requirements) will:

- Have a basic understanding of the following: 1) how science works (the scientific method); 2) tectonics; 3) geologic time; 4) Earth materials (e.g. the rock cycle, minerals, critical metals); and 5) climate change.
- Develop an appreciation for the methods of scientific inquiry in geosciences through hands-on laboratory experiences.
- Demonstrate the critical thinking and problem solving skills required in scientific disciplines.

Courses

GEOL 108. When Rocks Attack. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students explore popular depictions of natural disasters to assess their geologic plausibility. Not open to students who have taken GEOL 117 or GEOL 203 or GEOL 250.

GEOL 109. Energy and Natural Resources. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Origin, development, and use of natural resources for energy production with an emphasis on petroleum, natural gas, and nuclear energy and their impact on the environment. Not open to students who have taken GEOL 117, GEOL 203, or GEOL 250. Only open to first-years and sophomores.

GEOL 117. Environmental Geohazards. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Geologic environmental hazards. Emphasis on hazards recognition and assessment in seminars, and field applications. Topics include: soils, slopes, floods, fans, earthquakes, land use, coastal, and groundwater hazards. Preference given to first-years and sophomores. Not open to Geology majors, except by permission of instructor, or students who have taken GEOL 108 or GEOL 316.

GEOL 201. Earth and the Environment. 1 Credit.
Offered Summer Session Only; Lecture hours:3,Other:2
Earth and the Environment examines the fundamental geological processes that govern how the earth works. The topics include plate tectonics, types of rocks and minerals, the rock cycle, volcanism, seismicity, surface processes and introduction to geologic mapping. Finally, it examines the human impact on the geological environment.

GEOL 203. Physical/Environmental Geology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:4
Introduction to Earth's dynamic systems, plate tectonic processes that make Earth a unique planet, and human interaction with Earth. Geologic factors and limitations that affect use or management of the environment. Not open to students who have taken GEOL 250. Prerequisite: first- or second-year status, others by permission.

GEOL 204. Evolution of the Earth. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:4
Introduction to the evolution of life, climate, plate tectonics, and catastrophes through time provides perspective for making decisions about ongoing and future environmental change. Preference given to first-years and sophomores.

GEOL 208. Surface Mapping & Subsurface Imaging. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Course is designed for students without prior exposure to geoscience, to learn how to detect subsurface features (walls, roads, groundwater, bedrock). Students learn how to collect geospatial data over the earth’s surface, present/analyze data in a GIS environment. Not open to students who have taken GEOL 230 or GEOL 334.

GEOL 230. Environmental GIS. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Geographic Information Systems (GIS) in geologic mapping, environmental monitoring, and hydrologic modeling. Introduction to global positioning, (GPS), environmental databases, spatial analyses, and terrain modeling.

GEOL 250. Geology for Engineers. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:4
Basic principles, including properties of rocks and soils, hydrology, surface processes, rock mechanics, environmental parameters, geological hazards, and engineering case histories. Not open to students who have taken GEOL 203. GEOL 250 is restricted to first- and second-year civil and environmental engineering students and others by permission.

GEOL 304. Crystallography-Mineralogy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
Principles of crystallography and mineralogy; crystal morphology, structure, chemistry, physical properties, genesis, occurrence, and identification of important minerals by various techniques including chemical analysis. Prerequisite: GEOL 203 or GEOL 204 or GEOL 250 or permission of the instructor.

GEOL 305. Introduction to Geochemistry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:4
Composition of natural waters and sediments, basic thermodynamics and kinetics, acid-base and oxidation-reduction reactions, chemical weathering, stable and radioactive isotopes, carbon and nutrient cycles, anthropogenic impacts on geochemical cycles. Prerequisites: CHEM 203 or CHEM 205 or CHEM 207 or permission of the instructor. Crosslisted as GEOL 605.

GEOL 309. Sedimentology and Stratigraphy. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:4
Principles and techniques of the study of depositional processes and environments. Emphasis on semester-long sedimentary basin analysis project including analysis of Paleozoic outcrops near campus. Prerequisite: GEOL 204.

GEOL 311. Landscapes in GIS. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
Introduction to GIS applied to studying landscape processes and solving geologic problems, including coastal, volcanic, and desert landscapes, and geologic resource mapping. Course focuses on mastery of basic skills using ESRI ArcGIS software and using geologic spatial datasets. Not open to students who have taken GEOL 230.

GEOL 314. Structural Geology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:4
Orientation and geometric analyses of rock structures, kinematics and mechanics of rock deformation at all scales. Prerequisite: GEOL 203 or GEOL 250 or permission of the instructor. Crosslisted as GEOL 614.

GEOL 316. Geomorphology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:4
Physical processes shaping the Earth's surface and evolution of resulting landforms. Emphasis on linkages between landscape components and understanding complex relationships between process and form. Prerequisite: GEOL 203 or GEOL 204 or GEOL 250 or permission of the instructor. Crosslisted as GEOL 616.

GEOL 317. Paleontology. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3,Lab:4
Principles of evolution and ecology applied to investigation of ancient life. Emphasis on analysis of field collections of marine invertebrate fossils from Paleozoic outcrops near campus. Prerequisites: (BIOL 203 or BIOL 204) or (GEOL 203 or GEOL 204) and permission of the instructor.

GEOL 318. Undergraduate Research. .5-1 Credits.
Offered Summer Session Only; Lecture hours:Varies; Repeatable
Research course for qualified students in any branch of geology. Prerequisite: permission of the instructor.

GEOL 319. Undergraduate Research. .5-1 Credits.
Offered Fall Semester Only; Lecture hours:Varies; Repeatable
Research course for qualified students in any branch of geology. Prerequisite: permission of the instructor.

GEOL 320. Undergraduate Research. .5-1 Credits.
Offered Spring Semester Only; Lecture hours:Varies; Repeatable
Research course for qualified students in any branch of geology. Prerequisite: permission of the instructor.

GEOL 321. Special Topics in Geology. .5-1 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Lab:Varies; Repeatable
Investigation, report, or discussion on currently significant topics in geology. Prerequisite: permission of the instructor.

GEOL 322. Special Topics in Geology. .5-1 Credits.
Offered Spring Semester Only; Lecture hours:Varies; Repeatable
Investigation, report, or discussion on currently significant topics in geology. Prerequisite: permission of the instructor. Crosslisted as GEOL 622.

GEOL 325. Independent Study. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Independent study course for qualified students in any branch of geology. Prerequisite: permission of the instructor.

GEOL 334. Geophysics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:4
Introduction to geophysical principles and methods (seismic, gravity, magnetic, electrical, electromagnetic and GPR) applied to both near-surface and solid earth studies. Emphasis placed on active learning by hands-on geophysical data collection focused on environmental and engineering applications. Prerequisites: (One 200-level geology course and MATH 201) or PHYS 211P. Crosslisted as GEOL 634.

GEOL 336. Hydrogeology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:4
Water properties, fundamental flow equations, surface and subsurface flow, well hydraulics, regional flow, and contamination. Prerequisites: GEOL 203 or GEOL 250 and MATH 192 or MATH 201, or permission of the instructor.

GEOL 338. Applied Environmental Geomorphology. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3,Lab:4
Surviving on a complex and dynamic earth surface. Understanding environmental problems and geologic hazards with geologic principles set in a multidisciplinary framework. Prerequisites: GEOL 316 and permission of the instructor.

GEOL 340. Igneous and Metamorphic Petrology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:4
This class examines the mineralogy, petrography, geochemistry, origin and tectonic significance of igneous and metamorphic rocks. Prerequisite: GEOL 304.

GEOL 342. Caves and Karst. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:4
Students will learn how karst systems and associated landforms, like caves, form. We will explore the geochemistry and hydrogeology of karst aquifers and other topics using collected data, computer modeling, peer-reviewed literature and group projects. Students will be required to attend at least one of two weekend field trips.

GEOL 344. Paleoclimatology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:4
Course will focus on current questions in paleoclimatology and local paleoclimate history through the production of novel paleoclimate records. Survey of paleoclimate archives and proxies, geological controls on climate, Quaternary glacial cycles, warm periods as analogs for modern climate change, millennial-scale climate oscillations, Holocene and Common Era climate.

GEOL 450. Geosciences Futures. .5 Credits.
Offered Either Fall or Spring; Lecture hours:1.5
Geosciences majors (BS BA) will take this course as their culminating experience. Also appropriate for any student interested in geosciences-related careers or graduate education. Students will explore career and graduate school options in the geosciences by way of guest speakers, resume workshops, alumni contacts and preparation for geologist-in-training certification.

Greek

Faculty

Professors: Kevin F. Daly, Stephanie Larson

Associate Professors: Ashli Baker, Kristine Trego (Chair)

Assistant Professor: Katie Tardio

See Classics & Ancient Mediterranean Studies (p. 67).

Health Humanities Minor

Faculty

Coordinator: John Penniman (Religious Studies)

Coordinating Committee: Janet Adomako (Environmental Studies & Sciences), Olivia Boerman (Biomedical Engineering), Carly Boxer (Art & Art History), Theo Hopper (Biomedical Engineering), Jayne A. Kubat (Biology), Katharine McCabe (Women's & Gender Studies), Apollonya Maria Porcelli (Sociology), Jennifer Thomson (History), Allen L. Tran (Anthropology), Katherine Ward (Philosophy)

The health humanities is an interdisciplinary approach to the cultural, historical and ethical dimensions of health and medicine. Courses in the health humanities examine health and illness as concepts that are intimately connected to human bodies, human experiences and human cultures. Health contains and exceeds the human, and so humanities disciplines provide an expansive and interdisciplinary perspective on what it means to be healthy, ill, flourishing, languishing, living and dying. To explore health and illness in this framing is to engage in a wide spectrum of cultural literacies that are the hallmarks of a liberal arts education.

Bucknell's health humanities minor is designed for students from all three colleges and complements their studies in any other discipline. Students will explore the hidden, abandoned or neglected connections between health and its cultural, historical and environmental contexts. The courses of the minor prioritize textual and visual analysis, historical literacy, ethical reasoning, archival research, ethnography, as well as advanced levels of written and oral communication. In an age marked by historic global pandemics, health and illness remain urgent and contested categories requiring increasingly nuanced analysis and creative engagement. Students pursuing the health humanities minor will be uniquely prepared for a range of careers within and beyond health care.

Requirements of the Minor

The health humanities minor consists of five courses: HLTH 100 Intro to Health Humanities, one course from each of the three core categories, and one additional course at the 300 level from any core category. Students may request that credit from courses not listed here be counted toward the minor by contacting the director of the health humanities program.

HLTH 100	Intro to Health Humanities	1
Ethical and Philosophical Dimensions of Health		1
PHIL 220	Philosophy of Science	
PHIL 272	Philosophy of Biology	
PHIL 274	Bioethics	
RELI 226	Environmental Ethics	
Historical Engagements in Health and Medicine		1
ARTH 209	Art, Science, and Magic in the Medieval World	
ARTH 310	The Body in Premodern Art	
EAST 227	Health and Healing in Chinese History	

ENLS 250	Renaissance Literature, 1485-1660 (only when titled Reading the Renaissance Body, taught by Emily Loney)	
ENLS 290	Special Topics (only when titled Plague, Contagion, and Illness, taught by Emily Loney)	
ENLS 350	Seminar in Renaissance Literature (only when titled Performing Disability in Early Modern Literature, taught by Emily Loney)	
ENLS 397	Seminar in Special Topics (only when titled Narrating Disability, taught by Emily Loney)	
HIST 171	Introduction to the History of Medicine	
HIST 212	Histories of Environmental Health and Justice	
HIST 271	Health and Medicine in the 20th Century U.S.	
HIST 279	Topics in the History of Science and Medicine	
HIST 370	History of Science and Medicine	
RELI 250	How to Be Alone: Religion, Solitude, and Loneliness	
RELI 257	Yoga: Religion, History, Culture	
Social Contexts and Inequalities of Health		1
ANTH 290	Medical Anthropology	
ANTH 306	Culture and Madness	
ANTH 311	Mind, Madness and Medicine	
ANTH 312	Global Health	
CBST 315	Race, Sports and Politics	
ENLS 213	Special Topics in American Literature (only when titled Fiction and Reproductive Justice, taught by Chase Gregory)	
ENST 241	Environmental Health & Climate	
ENST 305	Gender, Environment & Health	
RELI 312	Digesting Divinity: Religion, Food and Diet	
SOCI 232	Sociology of Health and Medicine	
WMST 262	Gender, Race and Health	
WMST 350	Reproductive Justice & Health	
One 300-Level Course from Any Core Area		1

Courses

HLTH 100. Intro to Health Humanities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to the social, historical, environmental and ethical dimensions of health and medicine. It will prepare students to engage with health and illness as products of cultural processes by educating them in core concepts, historical case studies and research methods essential to the humanities.

History

Faculty

Professors: Claire Campbell (Chair), John P. Enyeart, Cymone Fourshey

Associate Professors: Paul Barba, David W. Del Testa, Mehmet Dosemeci, Jennifer Thomson

Assistant Professors: Zukhra Kasimova, Cassie Osei

The study of history stimulates our imagination, cultivates critical thinking and develops the skills necessary for communicating complex arguments. The fundamental academic work of researching, writing and speaking, as well as learning to analyze various sources (i.e., information literacy), are integral to the discipline of history and figure strongly in all of the department's courses.

History Major

Majors in history are allowed great latitude in designing a program to have depth and breadth. To ensure depth of historical understanding, we require majors to eventually focus upon a special particular field of study, such as (1) a specific historical theme (e.g., the history of women, gender, revolutions, colonialism); (2) a historical approach (e.g., intellectual and cultural history; science, technology and the environment; social and economic history); or (3) a period. *The department encourages students to select topics by the end of their junior year.*

To ensure breadth, the program must include: (1) at least one course in the history of Africa, Asia, Latin America or the Middle East; and (2) at least one course in pre-modern history (pre-1800).

Overall, the major requires nine courses, including a 100-level history course (taken before the subsequent requirement of 300-level courses), two 300-level seminars, and HIST 400 Undergraduate Research Seminar. Seven of the nine courses and all 300 and 400-level work must be taken at Bucknell. AP credits may not be applied toward the major. The department strongly recommends foreign language competence beyond the intermediate level.

In their senior year, majors will take HIST 400 Undergraduate Research Seminar. Students who write an honors thesis are exempt from this requirement. In addition, HIST 400 Undergraduate Research Seminar will serve as the Culminating Experience (CE) requirement for the history department.

Nine courses, including: [1]		
1 100-level HIST course [2]		1
2 300-level HIST seminars		2
5 additional HIST courses		5
HIST 400	Undergraduate Research Seminar [3]	1

1 These must include at least one course in the history of Africa, Asia, Latin America or the Middle East and at least one course in pre-modern history (pre-1800). Seven of the nine courses and all 300 and 400-level work must be taken at Bucknell.
2 This course must be taken before the subsequent requirement of 300-level courses.
3 This seminar serves as the Culminating Experience (CE) requirement for the history department.

Refer to the History Blog (https://history.blogs.bucknell.edu/) for more information.

Additional Course Accepted for History Credit:

EAST 227	Health and Healing in Chinese History	1

Minor in History

A **minor** in history consists of a minimum of five courses. One of these five courses must be a 300-level seminar. Only one HIST course at the 100 level may count toward the minor.

History Learning Objectives

Majors in History will be able to:

- Demonstrate a base of knowledge about important periods, events and ideas in different cultures. (1, 2, 3, 4, 5, 8, 9)
- Understand the historical context of ideas and events and evaluate differing scholarly interpretations of the past. (1, 2, 3, 4, 5, 8, 9)
- Critically evaluate and analyze historical evidence, when appropriate, in the form of primary documents. (1, 2, 3, 4, 5, 8, 9)
- Write articulately and persuasively on historical themes and issues based on critical understanding and logical, rigorous and creative thinking. (1, 2, 3, 6, 7, 8, 9)
- Speak articulately and persuasively on historical themes and issues based on critical understanding and logical, rigorous and creative thinking. (1, 2, 3, 6, 7, 8, 9)
- Demonstrate basic research skills and understanding of historical methods, including an ability to use the library and read intelligently and with purpose. (1, 2, 6, 8, 9)
- Demonstrate a synthesis of all of the above in an encompassing historical literacy. (1, 2, 6, 7, 8, 9)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

HIST 100. Thinking about History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Focus and content vary. An introductory history course for the development of informed historical analysis among its students. Primarily for first-year students.

HIST 111. Early America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to North American history from the pre-colonial period through the mid-nineteenth century. Open to first-year and sophomore students. Others by permission of the instructor.

HIST 112. The United States Since 1865. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the history of the United States following the Civil War. Open to first-year and sophomore students.

HIST 131. European Empires. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of Europe in the pre-industrial era. Content will vary with instructor. Open to first-year and sophomore students. Others by permission of the instructor.

HIST 132. Europe in the Twentieth Century. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of modern European History. Content and goals vary with instructor. Open to first-year and sophomore students.

HIST 171. Introduction to the History of Medicine. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A cross-cultural survey of medicine and public health, emphasizing how different societies have interpreted and responded to epidemic diseases. Open to first-year and sophomore students.

HIST 175. Africa: Pharaohs to Presidents. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to themes and trends in Africa's social and political histories from ancient to modern times. Open to first-year and sophomore students.

HIST 185. Visualizing Latin America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introductory survey of Latin American history from pre-contact origins to the present. Examines cross-cultural exchange and conflict through analysis of primary sources through multimedia (audio and visual images). Open to first-year and sophomore students.

HIST 191. World History I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introductory survey of world history. Examines how cross-cultural encounters and global exchanges of ideas, people and goods have shaped world history, from prehistory to 1500CE.

HIST 192. World History II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introductory survey of world history. Examines how cross-cultural encounters and global exchanges of ideas, people and goods have shaped world history since 1500 CE.

HIST 201. Introduction to Historical GIS. 1 Credit.
Offered Either Fall or Spring; Lecture hours:1,Other:2
This course analyzes events of the historical past using geographic information systems (GIS) digital mapping software. Not open to first-year students.

HIST 203. Digital Methods in Chinese Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:.5,Other:2.5
This course introduces students to digital tools and resources in Chinese studies. Topics include data mining, database design, and data visualization. It combines discussion of digitally#empowered scholarship in Chinese studies and training in the technical know#how. Knowledge of Chinese language, Chinese history, or programming is not required. Crosslisted as EAST 203.

HIST 204. American Identities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course challenges you to think about what it means to claim an American identity and who gets to determine that status. It covers issues related to notions of race, immigration, nationalization, deportation, and citizenship.

HIST 207. From Communism to Terrorism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the intertwining of diplomatic and domestic relations in the U.S. mostly from the Cold War through the "War on Terror." Although U.S. focused, we will discuss democracy, Communism, imperialism, and terrorism from a global perspective.

HIST 209. Society and Culture in Imperial China. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This course explores, in depth, a diversity of topics in pre-modern Chinese history from an interdisciplinary and comparative perspective. Besides Chinese history, we also discuss sociological/anthropological theories and history of other parts of the world. Thematic and temporal focus changes in each offering. Possible topics include economy, state, elite, religion. Crosslisted as EAST 209.

HIST 210. Urban America. 1 Credit.
Lecture hours:3
Cities are microcosms of the nation as a whole, places where debates about race, class, gender, nature, power, and technology take physical form, as Americans argue about how to share crowded spaces. U.S. cities and suburbs provide clues to the economic, cultural, social, and political context.

HIST 211. American West. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the development of the American West to 1900.

HIST 212. Histories of Environmental Health and Justice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
What does environmental health mean, and who gets to define it? This course examines the historical intersections of environment, race, economics, and health in the United States.

HIST 214. Topics in American History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary.

HIST 215. Mapping History: Nature, Place, and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines maps as markers of environmental history. Focusing on the North Atlantic and North America from the seventeenth century onward, the course will emphasize critical analysis of visual artifacts, the politics of cartography, and maps as records of our changing ideas about and impact on the natural world. Crosslisted as ENST 214 and GEOG 206.

HIST 216. England and France During The Hundred Years' War. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course explores how the traumas of the Hundred Years' War (1337-1460s) and the Black Death (1348) affected patterns of daily life, religious practice, class structure, peasant rebellions, knighthood, views of women, views of monarchy, university curricula, treatment of minorities. The focus is a cultural approach, not a military one.

HIST 218. American Revolution. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the war for independence and the origins of the United States.

HIST 219. American Abolition. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of social problems and movements during this era. Focus may vary. Slavery and slave narratives; underground railroads; utopian visions; abolitionists; strikes and labor protests.

HIST 220. American Civil War and Reconstruction. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The period is studied in depth as a revolutionary era through attention to political, economic, social, constitutional/legal, intellectual trends, events, personae, movements, and institutions.

HIST 222. U.S. History from the 1940s to the Present. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the creation of modern America from World War II to the present.

HIST 224. Eighteenth-century North America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A course that explores how different peoples (British, French, and American) claimed and fought over the environments of North America, shaping today's national borders.

HIST 225. Topics in American Political and Economic History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Intensive study of leading themes, in American history since 1600. Topics vary from year to year, but may include economic and political structures; intellectual movements, or social and cultural history.

HIST 226. American Capitalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the origins and development of capitalism in the United States. Property rights, how notions of time and space changed markets, prolitarianization, alienation, commodification and the role the government played (or not) in shaping the economy are some of the topics that we will cover. Crosslisted as ECON 246.

HIST 230. Europe from 11th to 17th Cen. 1 Credit.
Lecture hours:3
Survey of early modern European history 1000-1648.

HIST 232. Baseball and U.S. History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This is a history course that uses baseball as its lens to examine issues that fundamentally shape life in the U.S. Students in this course will explore topics such as segregation, racism, workplace struggles, gender divisions, battles over urban spaces, and the role sports plays in shaping our national identity.

HIST 237. The Renaissance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses upon the major religious, social, artistic, literary, and political constructs of the influential thinkers of the European Renaissance, 1300-1600.

HIST 239. Contemporary Europe, 1890-1995. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
The crises of European cultures: world wars, economic depression, social unrest, and the decline of hegemony, the struggles for revitalization.

HIST 240. Greek History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
From the heroic Bronze Age down through the Persian invasion, the flourishing of Classical Athens, and the Peloponnesian wars to the death of Socrates, focusing on political, social and economic developments. Crosslisted as CLAS 217.

HIST 241. Roman History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Roman history from Rome's foundations as a backwater village ca. 753 BCE, through its rise as a world-power to its fall in the fourth century CE, focusing on economic and political issues. Crosslisted as CLAS 218.

HIST 242. Topics in French History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Specific focus will vary but always a study of aspects of the constitution and transformation of major political-cultural formations which shape French society.

HIST 243. Placing the Past. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Through the integration and utilization of geographical and historical thinking, this course encourages students to explore forgotten, marginalized, and occluded moments in place and time, from the perspective of considering their potential significance and usefulness in the contemporary period. Crosslisted as GEOG 243 and UNIV 243.

HIST 245. Topics in German History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary. Intensive study of leading themes in German history since 1400.

HIST 247. Topics in European History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Intensive study of leading themes in European history since 1400. Topics will vary but may include economic and political structures, intellectual movements, or social and cultural history.

HIST 248. Topics in Russian History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary. This course aims to introduce new approaches to the history of the USSR as a multinational imperial formation from its inception to its collapse.

HIST 249. The Reformation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This interdisciplinary course explores how five 16th-century reformations -- Lutheran, Calvinist, Zwinglian, Anabaptist, Catholic -- altered practices of daily life. Students will "re-live" debates that occurred regarding the perceived advantages and disadvantages of these theologies, and explore how class, gender, occupation, and local economy affected the reception of these systems.

HIST 250. Medieval and Early Modern Russia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides a survey of the principal events and themes in Russian history from the ninth through the early 18th century.

HIST 251. Russian Empire. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the history of the Russian Empire, the Soviet Union and the present Russian Federation through the lens of imperial domination, expansion and the challenges of diversity.

HIST 252. Topics in Soviet History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics in political, intellectual, cultural, and social history of the Soviet Union from its inception to its demise.

HIST 253. Witches, Wenches, and Wives. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to key themes in women's and gender history during the early modern period, roughly 1500-1800. The course explores the complex material, political, social, and cultural factors that shaped perceptions of women and gender, as well as women's own experiences in early modern Europe.

HIST 254. Age of Enlightenment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the major social, cultural, intellectual, and political developments associated with the European Enlightenment, or "Age of Reason".

HIST 255. Under Siege: The Modern Middle East 1914-2014. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course surveys the history of the modern Middle East from the outbreak of WWI to aftermath of the Arab revolutions of 2011.

HIST 258. Topics in Women's and Gender History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary. Instructors shape the content according to their own interests in seeking insights into the historical construct of gender.

HIST 260. Black Women's History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines the history of Afro-descendant women beginning in pre-colonial West Central Africa to the present, emphasizing the experiences of Black women's political, civic, community and reform activities in the United States, Latin America and the Caribbean and Africa, analyzed within the context of racism, sexism and economic deprivation.

HIST 268. Power, Ideology, Existence: The History of Post-Enlightenment European Thought. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will survey the major currents and impulses that informed European thought over the past 200 years. Texts include works by Hegel, Marx, Nietzsche, Benjamin, Adorno, Heidegger, and Foucault.

HIST 271. Health and Medicine in the 20th Century U.S.. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines American experiences of health and sickness across gender, race, and class, and developments in medicine and public health from colonial times to the present.

HIST 274. Africa and International Relations in Historical Perspective. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
From popular culture: music, film, fashion to digital technologies: cell phones, computers, fit-bits, and GOOGLE-glass to our food: morning coffee, sugar, and spices, we rely on African ideas and resources. Through novels, films, and scholarly articles we examine how International Relations across Africa and with Africa matter in our lives. Crosslisted as CBST 274 and IREL 274.

HIST 275. Race and Colonial Regimes in Africa. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an overview of Africa between the 18th and 20th centuries. Of particular interest are the ways Africans dealt with European colonial regimes as they deployed race as a technology of control and how Africans challenged racial constructs.

HIST 276. Popular Culture in Africa. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course allows students to explore, experience, and analyze aspects of popular culture in contemporary sub-Saharan Africa. Manifestations of popular culture are considered as markers of modern African identities, embedded in complex and varied socio-cultural, -historical and -political contexts. Crosslisted as IREL 271.

HIST 277. Gender in Africa. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines gender and sexuality in Africa historically and contemporarily, using an examination of Africanist gender theory along with a critical examination of Western conventional categories and a critical approach to issues of family, generational tensions, sexuality, and power as useful ways for thinking through change in African history. Crosslisted as IREL 273 and WMST 277.

HIST 278. Photographing Race. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The history of photography is inseparable from histories of race, imperialism, and slavery. This course examines how camera and film technologies affected depictions of race globally. Beginning with the invention of the modern camera, this course traces dynamics of voyeurism, othering, and personhood in photography to the present day. Crosslisted as CBST 278.

HIST 279. Topics in the History of Science and Medicine. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary: non-orthodox medicine; women and science; women and medicine; technology and social change.

HIST 280. Topics in Latin American History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Examines the histories of Mexico and Central America, Brazil, and Argentina and the Southern Cone on a rotating basis. Topics vary.

HIST 281. Radical Democracy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Covering everything from Pirate Utopias to Slave Republics, Revolutionary Communes to Occupy Wall Street, this course examines the theoretical and historical attempts to practice democracy outside of the liberal representative model.

HIST 282. Modern Latin America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course traces and analyzes major developments in Latin American politics, society and culture from 1800 to the present. Crosslisted as LAMS 295.

HIST 285. The Middle East in Global Perspective. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will introduce students to a broad history of the Middle East and how it became known as a regional unit. The course examines the rise and fall of empires, revolutions, and emergent nation-states as well as questions of everyday life and how lives changed during different political periods.

HIST 286. Contemporary Japanese History. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:1
Political and cultural history of post-World War II Japan using various sources including film, anime, art, political cartoon, popular song. Crosslisted as EAST 256.

HIST 287. Perspectives: The Vietnam War. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A comprehensive examination of the conflicts in Vietnam from 1940 to 1981.

HIST 288. The History of Vietnam. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Intensive study of the history of Vietnam from the era of Chinese occupation in the second century BC to the present.

HIST 290. Europe Imperialism and Colonialism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Considers the rise, development, and fall of Western political and economic hegemony over the peoples and states of Asia and Africa since the late 19th century.

HIST 291. Africa: Ancient to Early Modern Times 4000BCE-1400CE. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of Africa from Ancient economic, social, cultural, economic, and political developments to the Early Modern Era and the rise of Atlantic era trade. This course focuses on social, cultural, political, and economic changes generated by populations across the continent. Crosslisted as CBST 291 and IREL 291.

HIST 292. Making Contemporary Africa: 'Early Modern' to the 'Post-Modern' World - 1400 to the Present. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of African history from the 15th century to the contemporary period. We explore six major themes in African History: The Indian Ocean World, Making of the Atlantic World, Colonialism in Africa, Nationalism and Independence Movements, Post-Colonialism and Issues in the Making of Contemporary Africa. Crosslisted as CBST 292 and IREL 293.

HIST 293. China from Ancient Times to the 18th Century. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Chinese history and culture from their beginning to the middle of the Qing Dynasty, before that dynasty and China were challenged by the West. Crosslisted as EAST 233.

HIST 294. China since 1800. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
China from the eve of its modern confrontation with the West to the present through years of traumatic challenge and change. Crosslisted as EAST 234.

HIST 295. From Shinto to Shogun: Pre-modern Japan. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course will examine the cultural and institutional developments which constitute the Japanese heritage, with emphasis on classical Heian and early medieval court culture and late medieval samurai society. Crosslisted as EAST 254.

HIST 296. Modern Japanese History. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Japan from a few hundred samurai-ruled domains loosely held together by a shogun to a bureaucratic modern nation-state in service to an emperor: small wars won, expansive empire gained, cosmopolitan cities built, and a big war lost. Crosslisted as EAST 255.

HIST 297. The People's Republic of China. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
A historical look at life in China under the rule of the Communist Party. Unprecedented triumphs and tribulations. Crosslisted as EAST 267.

HIST 299. Topics in Non-western History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected major issues in the study of imperialism and colonialism.

HIST 301. Environmental History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A seminar exploration of aspects of human interactions with the natural world over time. Not open to first-year students.

HIST 310. U.S. History to 1865. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary.

HIST 311. U.S. History since 1865. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary.

HIST 315. Urban Crisis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the history of towns, cities, and suburbs mostly in US history. Of particular focus will be incidents of urban unrest, which means taking a closer look at the roots exploring joblessness, state violence, the backlash against civil rights, new immigration, and interracial strife.

HIST 316. Independent Study. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Selected topics. Prerequisite: permission of the instructor.

HIST 319. African-American History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Focuses on recent developments in the field. Topics vary but may include slavery; African-American intellectual history; black feminism; race, class and gender; social and political movements; and cultural criticism.

HIST 330. European History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Intensive study of selected issues. Topics vary.

HIST 333. 20th Century Germany. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will examine the history of Germany in the 20th Century. We will unearth all the ways that German history has made us - i.e., how its history has sculpted the very ways we think about ethics, sex, politics, and culture today.

HIST 335. Russia and the World. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Challenging the popular image of Russia as an inward-looking power that has pursued its own Sonderweg (special path), this seminar will examine Russia’s connections to and interactions with the outside world in the early modern and modern periods.

HIST 337. Topics in Central Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This course will examine the history of Central Asia from the late 19th century to the present, from the Russian Imperial conquest to Soviet rule and the creation of the independent post-Soviet states.

HIST 350. Honors Thesis. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Credit may be taken either in one semester of the senior year or throughout the senior year.

HIST 355. Undergraduate Research. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies
Undergraduate research projects in collaboration with a history faculty member. Prerequisite: permission of the instructor.

HIST 370. History of Science and Medicine. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Intensive study of selected issues. Topics vary.

HIST 374. Human Trafficking: Ancient to Present Day. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course covers the very real and challenging topic of human trafficking in Africa and other parts of the world. Human Trafficking illuminates the interconnectedness of multiple systems of economics, politics, and culture through the transfer and control of labor. Crosslisted as IREL 474.

HIST 380. Topics in Global History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Global history examines interactions and collisions between and among cultures from a transnational perspective. It applies historical insights to diverse peoples in ways not possible from the vantage point of established regional and national history. Prerequisite: permission of the instructor.

HIST 385. Latin American History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary. Prerequisite: Permission of the instructor.

HIST 399. Non-western History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Intensive study of selected issues. Topics vary. Not open to first-year students.

HIST 3NT. History Non-traditional. 1-2 Credits.
Lecture hours:Varies
Non-traditional study in history.

HIST 400. Undergraduate Research Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies
Undergraduate research seminar required for the major. Prerequisite: permission of the instructor.

Interdepartmental

The Individual Interdepartmental Major

Students in the bachelor of arts curriculum who wish to study subjects, issues or interests that cannot be met by the offerings of an established major may do so by proposing an interdepartmental major. This major shall consist of no fewer than eight and no more than 12 courses chosen from among the offerings of two or more departments. The major also requires the successful completion of a senior project for academic credit to serve as the Culminating Experience for the interdepartmental major. All proposals for individual interdepartmental majors are submitted to the College of Arts & Sciences dean's office. Any subsequent requirements or special adjustments in this program will be proposed by the student and the primary adviser and submitted to the dean's office as well. Proposals will then be submitted to the Interdepartmental Major Subcommittee of the Arts & Sciences Curriculum Committee for review and approval.

For an interdepartmental major, students should follow this procedure:

1. Review the application process for the interdepartmental major by either searching for the most current version of the application on the Bucknell website or obtaining a hard copy or PDF copy of the application form from the college dean's office.
2. Identify and request a faculty member in one of the appropriate academic departments to serve as primary academic adviser.
3. Identify and request two additional faculty members in one or more of the appropriate academic departments to serve as secondary academic advisers.
4. In consultation with the primary adviser and professors in the departments offering courses clearly related to their special interests, define the limits and the central purpose of a major program of interdepartmental study.
5. With the assistance of the advisers, prepare a formal proposal including:
   a. a statement of the reasons to pursue an interdepartmental major,
   b. a list of the courses that will constitute the program of study, and
   c. a preliminary description of the senior project and the ways in which it will serve to unify and integrate the various courses of study. (A complete and detailed description must be submitted before registration in the spring of the student’s junior year.) This formal application is normally due before spring break of the sophomore year.
6. Having satisfied the above obligations, obtain signature endorsements of their proposals on the application form from their primary and secondary faculty academic advisers with whom they have conferred, as well as from the heads of the departments in which they plan to take courses to complete their major.
7. Submit the completed, signed form to the College of Arts & Sciences dean's office for submission to the Interdepartmental Major Subcommittee of the Arts & Sciences Curriculum Committee for review and final approval.

Courses

IDPT 320. Interdepartmental Independent Studies. .25-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Independent study on a topic of interest to the individual student. This course may fulfill a requirement for an interdepartmental minor. Prerequisite: permission of the instructor.

IDPT 352. Interdepartmental Major Project. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Independent research designed to unify and integrate the various courses that comprise the interdepartmental major. Prerequisite: permission of the instructor.

IDPT 379. Interdepartmental Thesis. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies
Interdepartmental major thesis.

IDPT 380. Interdepartmental Honors Thesis. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies
Interdepartmental Honors Thesis.

International Relations

Faculty

Professors: Cymone Fourshey, Emek M. Uçarer (Chair), Zhiqun Zhu

Associate Professors: David Mitchell, Ron J. Smith

Assistant Professors: Emma L. Banks, Manuel Larrabure

Visiting Assistant Professor: Aynal Haque

International relations is a field of study concerned with the cultural, economic, environmental, historic, military and political interactions among the major units of the world, such as states, international organizations, transnational corporations, nongovernmental organizations, groups and individuals. Courses from a number of departments and programs are drawn upon to offer a multidisciplinary major in international relations for the bachelor of arts degree.

The purposes of the major are to increase general knowledge about the history, institutions, interactions and events of the international system; to develop insight into the objectives, decisions and policies of state and nonstate actors; to provide a conceptual vocabulary and diverse theoretical perspectives to help explain and interpret international behavior; to build skills in critical analysis and evaluation of global issues; to develop an appreciation of commensurability and difference and acceptance of "others;" and to encourage evaluation and the solving of global problems. International relations majors will develop skills in writing, speaking and information literacy throughout their studies, but particularly in IREL 250 Theories of International Relations and their senior seminar Culminating Experience.

The international relations major provides a general education for students seeking greater knowledge about world affairs. It also provides a sound preparation for students interested in pursuing an M.A. or Ph.D. in international relations and related social sciences, a J.D. in law, or for careers in the Foreign Service, the federal government, international law, international business, banking and finance, international organizations, think tanks, nongovernmental organizations, and the Peace Corps. International relations alumni have been accepted to the nation's top graduate programs and law schools and are well represented in all of the listed international careers.

Major Requirements

The international relations **major** consists of at least 11 courses to count exclusively toward the major.

Undeclared students interested in majoring in international relations are encouraged to contact the IR chairperson with questions about their academic progress. While students who start taking courses toward the major during the second semester of their sophomore year will be able to complete the major in their remaining time at Bucknell, the department recommends the following sequence of progress through the major:

First year: Students can take POLS 170 or IREL 101 and ECON 101 during their first year. They should also take a language appropriate for the major. This language should align with their intended area concentration for the major.

Sophomore year: Students declare their major in the spring semester of the sophomore year. They should continue taking language courses. IREL 250 Theories of International Relations should be taken during the second semester of the sophomore year.

Junior year: IREL 250 should be taken during the first semester of junior year if not already completed in the sophomore year. Students should take IREL 350 Globalization as juniors. Students should also take the anchor courses for their thematic concentration and a course fulfilling the history requirement for their area concentration. They should continue to make progress in their language. Students are encouraged to study abroad for one or two semesters during their junior year.

Senior year: Students should complete their Culminating Experience requirement by enrolling in a senior seminar. They should also complete their language requirements and the remaining requirements for the major.

ECON 101	Economic Principles/Problems	1
POLS 170	International Politics (to be completed by end of sophomore year)	1
or IREL 101	War, Peace, Power & Prosperity	
IREL 250	Theories of International Relations [1]	1
IREL 350	Globalization [2]	1
Area concentration history course [3]		1

Two area concentration courses (see list below) [4]	2
Thematic concentration core course (see list below) [5]	1
Two thematic concentration courses [5]	2
One Culminating Experience seminar [6]	1
Total Credits	**11**

1 IREL 250 Theories of International Relations should be taken in the second semester of the sophomore year or in the first semester of the junior year. Students planning to spend a full year abroad should make sure that they complete IREL 250 before they go abroad. Students will ordinarily take POLS 170 International Politics before enrolling in IREL 250 Theories of International Relations, which is a W2 and will develop skills in writing, speaking and information literacy.

2 IREL 350 Globalization should ordinarily be taken during the fall of the junior year. If a student is spending the entire junior year abroad, it may be taken during the senior year. Students will ordinarily take ECON 101 Economic Principles/Problems before enrolling in IREL 350.

3 One course must satisfy the history requirement for this area. The acceptable history courses for each area concentration are indicated by an asterisk (*) in the area concentration course lists. History courses taken abroad that are to be counted toward the area concentration must focus on the region or country of study. Histories of individual cities will not be accepted as satisfying the history requirement for the area concentration.

4 No more than two of these courses may be in the same department. A course that is counted toward the area concentration may not count toward a thematic concentration.

5 All core thematic concentration courses must be completed on campus. It is recommended that students take the core course first. A course that is counted toward a thematic concentration may not count toward an area concentration.

6 Students must enroll in a seminar during either semester of the senior year. This seminar, taught by international relations faculty and enrolled by international relations students, will serve as the College of Arts & Sciences Core Curriculum (CASCC) Culminating Experience requirement. These courses will be taught as W2s and will develop skills in research writing, speaking, presenting and information literacy. IR seminars that are Culminating Experiences are designated by IREL 4XX course number.

Area Concentrations

The area concentrations offered are:

Africa

ECON 224	African Women & Social Action	1
ECON 235	African Economic Development	1
ENST/CBST 263	Conservation in Africa	1
FREN 336	Francophone Worlds	1
HIST 275	Race and Colonial Regimes in Africa	1
HIST 276/IREL 271	Popular Culture in Africa	1
HIST 290	Europe Imperialism and Colonialism *	1
HIST/IREL 291	Africa: Ancient to Early Modern Times 4000BCE-1400CE	1
HIST/CBST 292/IREL 293	Making Contemporary Africa: 'Early Modern' to the 'Post-Modern' World - 1400 to the Present *	1
IREL 273/HIST 277/WMST 277	Gender in Africa	1
IREL/HIST 274	Africa and International Relations in Historical Perspective	1
POLS 211	Politics of the Developing World	1
Language Competency:		
ARBC 217	Advanced Arabic I	

A one-credit, 200-level course taught in French.

Asia

ANTH/WMST 232	Gender and Sexuality in South Asia	1
ANTH 243	Violence and Politics in Southeast Asia	1
EAST 228	China Through the Lens	1
EAST 234/HIST 294	China Since 1800 *	1
EAST 255/HIST 296	Modern Japanese History *	1
EAST 256/HIST 286	Contemporary Japanese History	1
EAST 267/HIST 297	The People's Republic of China *	1
ECON/EAST 339	China & East Asian Economics	1
ENST/POLS/RUSS 357	Petroleum Putinism & Plutonium	1
IREL/POLS 225/EAST 269	Chinese Politics	1

IREL/POLS/EAST 226	East Asian Politics	1
IREL/POLS 283/EAST 248	International Relations of East Asia	1
RELI 200/EAST 251	Buddhism	1
RELI 202	Hinduism	1
RELI 245/EAST 252	Chinese Communist Religion	1
Language Competency:		
CHIN 201	Chinese III	
JAPN 201	Japanese III	

Europe, Eurasia & Russia

ECON 405	Comparative Economic Systems	1
FREN 270	La France actuelle	1
FREN 370	Topics in Civilization (when relevant)	1
GRMN 270	The Bourgeois Era: 19th-century Germany	1
GRMN 272	Modern German Culture 1945-1990	1
GRMN 295	Topics in German Studies (when relevant)	1
GRMN 393	Advanced Seminar in Selected Cultural Topics (when relevant)	1
HIST 132	Europe in the Twentieth Century *	1
HIST 239	Contemporary Europe, 1890-1995 *	1
HIST 247	Topics in European History (when relevant and must be taken on campus)	1
HIST 290	Europe Imperialism and Colonialism *	1
HIST 330	European History (when relevant) *	1
IREL 218/POLS 284	International Relations of Europe *	1
ITAL 295	Topics in Italian Studies (when relevant)	1
POLS 223	European Politics	1
RUSS 330	Nabokov and His Worlds	1
SPAN 270	Spanish Cultural Tradition	1
SPAN 295	Topics in Spanish (when relevant)	1
Language Competency:		
Select one of the following: (or equivalent taken elsewhere)		1
A one-credit, 200-level French course taught in French		
GRMN 204	Introduction to German Studies	
ITAL 205	Discovering Italy	
A one-credit, 200-level Russian course taught in Russian		
SPAN 207	Toward Advanced Spanish	

Latin America & Caribbean

ECON 273/IREL 278	Latin American Economic Development	1
GEOG 309	Topics in Advanced Economic Geography	1
HIST 185	Visualizing Latin America	1
HIST 280	Topics in Latin American History	1
HIST 282/LAMS 295	Modern Latin America *	1
HIST 311	U.S. History since 1865 *	1
IREL 201	Modernization and Social Revolution in Latin America	1
IREL 205	Violence, Conflict and Peace in Latin America	1
IREL 208	Global Indigenous Politics and Law	1
IREL 227	Latin American Politics and Development	1
IREL 278/LAMS 273	Latin American Economic Development	1
LAMS 150	Latin America: An Introduction *	1
LAMS 202/ENST 209/ANTH 202	Rainforests and Eco-Politics in Latin America	1
LAMS/CBST 204	Racism(s) Across the Americas	1
POLS 211	Politics of the Developing World	1
POLS 219	Latin American Politics	1

Language Competency:		
SPAN 207	Toward Advanced Spanish	1

Middle East

ARBC 250	Topics in Arabic Studies (Feminist Movement in the Arab World)	1
HEBR/UNIV 236	Israel: Literature, Film, Culture	1
HEBR/UNIV 292	After the Holocaust: Israel & United States	1
HIST 285	The Middle East in Global Perspective	1
HIST 290	Europe Imperialism and Colonialism *	1
HIST 299	Topics in Non-western History (when relevant)	1
IREL 229	Middle East Conflict and Revolution	1
POLS 224	Government and Politics of the Middle East *	1
POLS 290	Topics in Politics (Violent Nonstate Actors)	1
RELI 201	Islam	1
RELI 209	Israel: Land, People, and Tradition *	1
RELI 210	Judaism	1
Language competency:		
ARBC 217	Advanced Arabic I	

Thematic Concentrations

Each concentration is anchored by a required core course.

Culture & Identity

ANTH/WMST 232	Gender and Sexuality in South Asia	1
ANTH 243	Violence and Politics in Southeast Asia	1
ANTH 256	Anthropology of Native North America	1
EAST 120	Introduction to Chinese Culture	1
EAST 228	China Through the Lens	1
ENLS 227	Caribbean Literature	1
ENST 232	Identity, Inequality, and the Environment	1
ENST 320/ANTH 307/LING 320	Language & Environmental Politics	1
FREN 236	Topics in Francophone Literature and Culture (when appropriate)	1
HIST 239	Contemporary Europe, 1890-1995	1
HIST/IREL 274	Africa and International Relations in Historical Perspective	1
HIST 276/IREL 271	Popular Culture in Africa	1
HIST 286/EAST 256	Contemporary Japanese History	1
HIST 292	Making Contemporary Africa: 'Early Modern' to the 'Post-Modern' World - 1400 to the Present	1
IREL 208	Global Indigenous Politics and Law	1
IREL/GEOG 216	Borders and Politics of Mobility	1
IREL 265	Culture, Identity, and Power (core course)	1
IREL 273/HIST 277/WMST 277	Gender in Africa	1
ITAL 385	Corsets and Curses	1
WMST/ECON 224	African Women & Social Action	1

Development & Sustainability

ANTH 251	Gender, Power and Global Development	1
ECON 235	African Economic Development	1
ECON/LAMS 273	Latin American Economic Development	1
ECON/EAST 339	China & East Asian Economics	1
ECON 357	Economic Development	1
ENST/GEOG 215	Environmental Planning	1
ENST 226	Water & Power	1
ENST 232	Identity, Inequality, and the Environment	1
ENST 245/POLS 291	Environmental Politics, Policy, & Justice	1

ENST 255	Environmental Injustice and Activism	1
ENST/CBST 263	Conservation in Africa	1
ENST 320/ANTH 307/LING 320	Language & Environmental Politics	1
ENST/GEOG 325	Nature, Wealth and Power	1
ENST/POLS/RUSS 357	Petroleum Putinism & Plutonium	1
GEOG 209	Economic Geography	1
GEOG 227	Geographies of Uneven Development	1
GEOG 257	Climate Change	1
GEOG/ENST 345	Food and the Environment	1
IREL 208	Global Indigenous Politics and Law	1
IREL 217	Environment Conflict and Security	1
IREL 234	Environment & Development	1
IREL 240	Human Security	1
IREL 252	Political Economy of Global Resources (core course)	1
LAMS 202/ENST 209	Rainforests and Eco-Politics in Latin America	1
POLS/IREL 277	International Political Economy	1

Foreign Policy & Diplomacy

EAST 248	International Relations of East Asia	1
ECON/EAST 339	China & East Asian Economics	1
ECON 418	American Economic History	1
GEOG 211	Geopolitics & Political Geography	1
HIST 214	Topics in American History (when relevant)	1
HIST 247	Topics in European History (when relevant)	1
HIST 287	Perspectives: The Vietnam War	1
HIST 290	Europe Imperialism and Colonialism	1
HIST 299	Topics in Non-western History (when relevant)	1
HIST 311	U.S. History since 1865 (when relevant)	1
HIST 399	Non-western History (when relevant)	1
IREL 201	Modernization and Social Revolution in Latin America	1
IREL 203	Social Justice and the Politics of Global and International Health	1
IREL/GEOG 216	Borders and Politics of Mobility	1
IREL 218/POLS 284	International Relations of Europe	1
IREL 240	Human Security	1
IREL 274	Africa and International Relations in Historical Perspective	1
IREL/POLS 275	Global Governance	1
IREL 276	Foreign Policy Analysis (core course)	1
IREL/POLS 283	International Relations of East Asia	1
POLS 271	American Foreign Policy	1
POLS 272	U.S. National Security Policy	1
POLS 280	War	1
POLS 288	French Foreign Policy Since 1945	1

Global Governance & Conflict Resolution

ENST 245/POLS 291	Environmental Politics, Policy, & Justice	1
HIST 311	U.S. History since 1865 (when relevant)	1
HIST 399	Non-western History (when relevant)	1
IREL 200	International Relations: Topics/Issues (when relevant)	1
IREL 203	Social Justice and the Politics of Global and International Health	1
IREL/LAMS/ANTH 205	Violence, Conflict and Peace in Latin America	1
IREL 207	Development, Disasters and Displacement	1
IREL/LAMS/ANTH 208	Global Indigenous Politics and Law	1
IREL/GEOG 216	Borders and Politics of Mobility	1

IREL 217	Environment Conflict and Security	1
IREL 218/POLS 284	International Relations of Europe	1
IREL 229	Middle East Conflict and Revolution	1
IREL 240	Human Security	1
IREL 252	Political Economy of Global Resources	1
IREL 255/POLS 278	International Law	1
IREL/POLS 275	Global Governance (core course)	1
IREL/POLS 277	International Political Economy	1
IREL/POLS 286	Nonstate Actors in International Relations	1
POLS 280	War	1
POLS 290	Topics in Politics (Violent Nonstate Actors)	1

Additional Requirements

There are three additional requirements and rules for the international relations major as stipulated below:

- Of the 11 courses recorded for the major, no more than six courses may be taken from one department.
- No more than two off-campus courses will count toward the major per semester of study abroad. Students studying abroad for one semester may count two courses toward the major. Students studying abroad for a full year may count four courses toward the major.
- Competence must be demonstrated in a foreign language that is compatible with the area concentration, normally by successfully completing a one-credit, fifth-semester equivalent course in the target language on the culture or society of a country or region. The language(s) appropriate to each area concentration, and the Bucknell equivalent levels that are required to satisfy the major's language requirement, are noted in the area concentration course list. International students whose native language is not English are exempt, in consultation with the department chair, from the language requirement if they select an area concentration suitable for the native language.

One semester of study abroad is strongly recommended in a country within the area concentration and where the language being used for the language requirement is spoken. To receive credit for study abroad, it is expected that the country visited will fit with the area of concentration. With prior approval, students may transfer credit from study abroad that is outside their area of concentration if the study abroad is intended to complement a thematic concentration.

Other Considerations

Off-campus study in Washington, D.C., including the Washington Semester or Washington Center, also is recommended, but not as highly as overseas study. Students should contact the Office of International Education for information about off-campus study.

The department encourages students to pursue summer internships in positions related to international relations. Students have interned in embassies abroad as well as in government agencies in Washington, D.C.

Students who are interested in pursuing a subject in greater depth are encouraged, in consultation with their academic adviser, to consider independent study or honors thesis. Students planning to pursue graduate study in international relations should consider taking a course in social science methods, and microeconomics and macroeconomics.

For additional information, students are encouraged to visit the Department of International Relations website at bucknell.edu/InternationalRelations (http://www.bucknell.edu/InternationalRelations/).

International Relations Minor

The international relations **minor** consists of a minimum of five courses.

POLS 170	International Politics	1
or IREL 101	War, Peace, Power & Prosperity	
IREL/POLS 277	International Political Economy	1
or ECON 101	Economic Principles/Problems	
Select one of the following:		3
Three courses from one area concentration (see lists on the major's page).		
Three courses from one thematic concentration (see lists on the major's page).		

Students who choose to complete their international relations minor through an area concentration are encouraged to take one of the designated history courses, which are noted with an asterisk (*) in the lists on the department's webpage. Students who choose to complete their international relations minor through a thematic concentration are encouraged to take the appropriate core course indicated in the thematic track list. Students minoring in international relations are strongly encouraged, but not required, to develop competence in a suitable language.

1. Understand the major concepts of international relations, including: power, the international system, balance of power, hegemony, conflict, cooperation, integration, globalization, interdependence, dependence, regimes, equality, justice, sustainability and international political economy.
2. Understand and critically evaluate the theories and approaches to international relations, including realism, liberalism, classical and neo-Marxism, Neo-Gramscian, critical, post-modernist, post-colonial, sexuality and feminist.
3. Identify the key actors in international relations—including states, intergovernmental organizations, non-governmental organizations, transnational corporations, global civil society, and individuals—and understand how these actors interact to give substance to international relations.
4. Demonstrate a knowledge of the key dimensions, events and processes of international relations within their historic context, such as: the formation of the modern state system, the Treaty of Westphalia, the evolution of global capitalism, the origins of the Cold War, the shift to the post-Cold War system, the role of race, gender and class in the structure of the modern world system, major conflicts, such as the world wars, U. S. intervention in various places in the world, ascendant conflicts, the features and effects of globalizing market capitalism, growing environmental problems and human rights.
5. Demonstrate knowledge of the multi-disciplinary nature of international relations by establishing connections with the disciplines that have shaped and continue to influence international relations: politics, economics, society, culture, history, language, race, ethnicity, gender and sexuality.
6. Demonstrate skills of critical analysis and written and oral communication, including the ability to:
   a. Read and reflect on disciplinary materials and literature carefully, critically and insightfully;
   b. Write well-organized, informed, logically argued, clear, persuasive and stylistically correct essays and papers;
   c. Participate actively in class discussions, verbally expressing ideas clearly, logically and persuasively.
7. Work effectively in teams and project groups.

Courses

IREL 100. Globalization & World (Dis)Order. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore the restructuring of the political, economic, and cultural dimensions of the global world by a way of the theoretical literature on globalization and a series of case studies. This course cannot be taken for IR major credit.

IREL 101. War, Peace, Power & Prosperity. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This multidisciplinary introduction to international relations draws on history, geography, anthropology, economics and politics. It introduces students to global affairs through geographic regions and discusses themes such as intercultural relations, identity, development, sustainability, conflict, power, governance and foreign policy. It applies these frames to a variety of contemporary global issues.

IREL 200. International Relations: Topics/Issues. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected topics in international relations.

IREL 201. Modernization and Social Revolution in Latin America. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This class examines how technological and political processes combine focusing on the Latin American region.

IREL 203. Social Justice and the Politics of Global and International Health. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Health crises are a permanent part of human societies. The COVID19 pandemic is a model of various approaches countries take to health crises, and highlights the successes and failures of various models of health care provision. This course explores global public health problems using the lens of international relations.

IREL 205. Violence, Conflict and Peace in Latin America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the historical and contemporary causes of political, structural, and systematic forms of violence in Latin America. Crosslisted as ANTH 205 and LAMS 205.

IREL 207. Development, Disasters and Displacement. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores how development projects, natural disasters, climate change, violent conflict, and the environment force people to migrate both within and between nations.

IREL 208. Global Indigenous Politics and Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores Indigenous people's historical and contemporary struggles for recognition and respect with an emphasis on Indigenous groups in Latin America and global governance. Crosslisted as ANTH 208 and LAMS 208.

IREL 212. Politics of India/South Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an introduction to the major contemporary political issues and trends in the region of India/South Asia. Themes will include colonialism, nationalism, economic growth and development, democracy vs. authoritarianism, religious fundamentalism, and ethnic conflict. Crosslisted as POLS 212.

IREL 216. Borders and Politics of Mobility. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the politics of contemporary nation state borders, issues of territory, sovereignty, mobility, migration, identity, citizenship, statelessness, and focuses on borders at other scales. Crosslisted as GEOG 216.

IREL 217. Environment Conflict and Security. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the link between environmental and human security, and the stakes for both humans and non-humans in climate change, natural disaster, and resource conflicts.

IREL 218. International Relations of Europe. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course will examine the foreign policies of European countries, individually and collectively through the European Union, toward each other, regional and global intergovernmental organizations, and other regions/countries. Crosslisted as POLS 284.

IREL 225. Chinese Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines China's rich political history, its dynamic economic and social changes, its lasting political changes, its enduring struggle for modernization, and its evolving relations with the rest of the world. Crosslisted as EAST 269 and POLS 225.

IREL 226. East Asian Politics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course surveys history, politics, economy, and society of countries in East Asia. It investigates the continuity and change in politics and policies of China, Japan, Korea, and selected countries in Southeast Asia. Crosslisted as EAST 226 and POLS 226.

IREL 227. Latin American Politics and Development. 1 Credit.
Offered Occasionally; Lecture hours:3
This course introduces students to key themes in Latin American politics and development, including modernization, populism, revolution, structural adjustment, the Pink Tide, and the new right. Potential and emerging alternatives to neoliberalism in the region are also explored.

IREL 229. Middle East Conflict and Revolution. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course explores some of the most significant controversies, conflicts, revolutions, and resolutions, both historical and contemporary, that define the Middle East as a region.

IREL 234. Environment & Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
What is the relationship between development and the environment? This course lays out frameworks for understanding the engagement of development with the environment. This includes exploring circuits through which processes (economic, environmental, and social) and goods circulate, including cases from “sustainable” forestry, carbon economies, and the global trade in waste.

IREL 240. Human Security. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores emerging debates around human vulnerability and conflict, climate change, displacement, development and other forms of security.

IREL 250. Theories of International Relations. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Analysis and evaluation of main theories of international relations, including realist, neo-realist, liberal, neo-liberal, Gramscian, Marxist, feminist, and post-modernist approaches. Theories are related to the major dimensions of international relations. Prerequisites: IREL 101 or POLS 170. Preference given to second semester sophomores and junior IREL majors.

IREL 252. Political Economy of Global Resources. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A study of environmental and energy economics in the context of global resources and politics. The theme of sustainable development will be linked to the new realities of international relations. Prerequisite: ECON 101 or ECON 103.

IREL 255. International Law. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
The nature, historical development, and sources of international law; substantive and procedural international law and its role in international relations. Crosslisted as POLS 278.

IREL 265. Culture, Identity, and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will learn a range of theories and concepts that explain how gender, race, ethnicity, sexuality, class, nationality, religion, and other forms of difference shape and are shaped by international affairs.

IREL 271. Popular Culture in Africa. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course allows students to explore, experience, and analyze aspects of popular culture in contemporary sub-Saharan Africa. Manifestations of popular culture are considered as markers of modern African identities, embedded in complex and varied socio-cultural, historical and political contexts. Crosslisted as Hist 276.

IREL 273. Gender in Africa. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines gender and sexuality across Africa historically and contemporarily, using an examination of Africanist gender theory along with a critical examination of Western conventional categories and a critical approach to issues of family, generational tensions, sexuality, and power as useful ways for thinking through change in African history. Crosslisted as HIST 277 and WMST 277.

IREL 274. Africa and International Relations in Historical Perspective. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
From popular culture: music, film, fashion to digital technologies: cell phones, computers, fit-bits, and GOOGLE-glass to our food: morning coffee, sugar, and spices, we rely on African ideas and resources. Through novels, films, and scholarly articles we examine how International Relations across Africa and within Africa matter in our lives. Crosslisted as CBST 274 and HIST 274.

IREL 275. Global Governance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the rationales, processes, and institutions of multilateral governance in a globalized world. We examine the U.N., nongovernmental organizations, conflict resolution, economic development, environment, human rights, and international law. Not open to first-year students. Crosslisted as POLS 275.

IREL 276. Foreign Policy Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course is designed to introduce students to the theories that have been developed to explain foreign policy processes and foreign policy behavior. The course will also examine and discuss the foreign policies of specific international actors. Crosslisted as POLS 276.

IREL 277. International Political Economy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the politics of international economic relations including trade, finance, and development. Crosslisted as POLS 277.

IREL 278. Latin American Economic Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course deals with historic and contemporary economic problems, starting from colonial times and reaching the present integration into world economy. Crosslisted as ECON 273 and LAMS 273.

IREL 283. International Relations of East Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course offers an overview of international relations in East Asia, with focus on foreign policies of major states in the region as well as their political, economic, and social interactions. Crosslisted as EAST 248 and POLS 283.

IREL 286. Nonstate Actors in International Relations. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course explores the role nonstate actors (such as nongovernmental organizations, multinational corporations, violent nonstate actors, and individuals) can and do play in various substantive areas of international relations. Crosslisted as POLS 286.

IREL 291. Africa: Ancient to Early Modern Times 4000BCE-1400CE. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of Africa from Ancient economic, social, cultural, economic, and political developments to the Early Modern Era and the rise of Atlantic era trade. This course focuses on social, cultural, political, and economic changes generated by populations across the continent. Crosslisted as CBST 291 and HIST 291.

IREL 293. Making Contemporary Africa: 'Early Modern' to the 'Post-Modern' World - 1400 to the Present. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of African history from the 15th century to the contemporary period. We explore six major themes in African History: The Indian Ocean World, Making of the Atlantic World, Colonialism in Africa, Nationalism and Independence Movements, Post-Colonialism and Issues in the Making of Contemporary Africa. Crosslisted as CBST 292 and HIST 292.

IREL 2NT. International Relations Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in international relations. Prerequisite: permission of the instructor.

IREL 300. Seminar: Topics in International Relations. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This course considers the shift in international politics from an ethic based upon state security to one focused on human security. Prerequisite: permission of the instructor.

IREL 350. Globalization. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This course is designed to provide IREL majors with an opportunity to study global change. The course addresses contemporary issues in globalization. Specific topics may vary. Normally taken in fall of junior or senior year. Prerequisites: IREL majors. Students should preferably have ECON 101 and IREL 250.

IREL 356. Nationalism, Nature & the Future. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the geographies and politics of nationalism, the ways in which nature is nationalized, the construction of nature in environmental contestations and reactions to nationalism, and the intersection of nationalism with other social constructions. Crosslisted as ENST 356.

IREL 360. Independent Study. .5-1 Credits.
Offered Fall Semester Only; Lecture hours:Varies; Repeatable
Open to international relations majors who wish to pursue individual programs of reading, research, and writing under the supervision of a professor, usually for completion of the honors thesis. Prerequisites: permission of the supervising IREL professor and permission of the instructor.

IREL 361. Independent Study. .5-1 Credits.
Offered Spring Semester Only; Lecture hours:Varies; Repeatable
Open to international relations majors who wish to pursue individual programs of reading, research, and writing under the supervision of a professor, usually for the completion of the honors thesis. Prerequisites: permission of the supervising IREL professor and permission of the instructor.

IREL 415. Human Rights. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
The seminar will study human rights, primarily from an international perspective, including self-determination, cultural rights, ethnic and racial rights, women's rights, religious rights, and lesbian and gay rights. Open to seniors majoring in IREL or POLS, others by permission of the instructor. Crosslisted as POLS 389.

IREL 418. Social Movements and Society. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This seminar examines social movements in International Relations in multiple contexts across the globe, through a variety of scales.

IREL 474. Human Trafficking: Ancient to Present Day. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course covers the very real and challenging topic of human trafficking in Africa and other parts of the world. Human Trafficking illuminates the interconnectedness of multiple systems of economics, politics, and culture through the transfer and control of labor. Crosslisted as Hist 374.

IREL 482. U.S.-China Relations. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Through tracing the evolution of U.S.-China relations from the 18th century to the 21st century, this course discusses major issues and challenges between the two countries today. Future trends of the bilateral relationship will also be explored. Prerequisite: POLS 170. Preference given to EAST, IREL, and POLS seniors. Crosslisted as EAST 382 and POLS 382.

Japanese Language

Faculty

Professor: Elizabeth L. Armstrong (Teaching)

Associate Professors: Song Chen, Erik R. Lofgren (Chair), James J. Orr, Xi Tian

Assistant Professor: Yunjing Xu

Visiting Assistant Professor: Yuka Kaneko Hughes

See East Asian Studies (p. 94).

Jewish Studies Minor

Faculty

Coordinator: Or Rogovin

The interdisciplinary minor in Jewish studies consists of **5** courses from the lists below, comprising primarily "core" courses or "topics" courses in Jewish studies, with no more than one "secondary" course.

Core Courses

(The primary focus of which is Judaism.)

ENLS 268	Jewish-American Literature and Film	1
GRMN 274	Holocaust Literature	1
GRMN 276	German Jewish Identities	1
GRMN 279	Never Again?: Antisemitism	1
HEBR 101	Beginning Modern Hebrew	1
HEBR 102	Beginning Modern Hebrew II	1
HEBR 103	Intermediate Hebrew I	1
HEBR 104	Intermediate Hebrew II	1
HEBR 204	Hebrew Conversation	.5
HEBR 205	Holocaust: Fact, Fiction, Film	1
HEBR/UNIV 236	Israel: Literature, Film, Culture	1
HEBR 251/UNIV 263	The Jewish Uprooted	1
HEBR 252	The Modern Jewish Experience in Lit&Film	1
HEBR/UNIV 292	After the Holocaust: Israel & United States	1
RELI 100	Introduction to Religion (taught as Introduction to the Bible)	1
RELI 207	Holocaust: Event and Reception	1
RELI 209	Israel: Land, People, and Tradition	1
RELI 210	Judaism	1
RELI 222	Images of Jerusalem	1
RELI 237	Judaism in Film	1
RELI 276	Judaism and Masculinity	1
RELI 279	Judaism and Law	1
RELI 305	The Male Body in Judaism	1
RELI 306	Messianism and Madness	1
RELI 316	Topics in Religion and Culture (taught as Holocaust: Eclipse of God)	1
RELI 318	Jewish Thought	1

Secondary Courses

(The focus of which includes Judaism.)

CLAS 218	Roman History	1
PHIL 206	Medieval Philosophy	1

Topics Courses

(When the focus of the course includes Judaism and the course has the approval of the Board of the Interdisciplinary Minor in Jewish Studies.)

GRMN 393	Advanced Seminar in Selected Cultural Topics	1
HIST 245	Topics in German History	1
HIST 247	Topics in European History	1
RELI 315	Topics in American Religion	1
RELI 325	Major Religious Thinkers	1
UNIV 200	Integrated Perspectives Course	1

Courses

HEBR 101. Beginning Modern Hebrew. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Introduction to modern Hebrew. Practice in listening, speaking, reading, and writing, elementary grammar and introduction to Israeli culture.

HEBR 102. Beginning Modern Hebrew II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Continuation of Modern Hebrew language skills. Practice in listening, speaking, reading, and writing and introduction to Israeli culture. Prerequisite: HEBR 101 or equivalent. Not open to students who completed HEBR 101A.

HEBR 103. Intermediate Hebrew I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
A continuation and review of grammar emphasizing all four skills and culture. Prerequisite: HEBR 101A or HEBR 102 or equivalent.

HEBR 104. Intermediate Hebrew II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Further review of grammar with emphasis on all four skills and culture. Prerequisite: HEBR 103 or equivalent.

HEBR 150. Topics in Jewish Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of topics in Jewish cultures or societies.

HEBR 204. Hebrew Conversation. .5 Credits.
Offered Both Fall and Spring; Lecture hours:2; Repeatable
Focused on the concentrated development of Hebrew speaking skill and knowledge of Israeli culture.

HEBR 205. Holocaust: Fact, Fiction, Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course examines the persecution and extermination of Jews and other groups by Nazi Germany (1933-1945) through three sets of lenses: historical facts, their representation in fiction (and other forms of writing) and their representation on the screen.

HEBR 236. Israel: Literature, Film, Culture. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Course explores Israeli culture in its historical, ethnic, religious, linguistic, and geographical context through literature, film, political discourse, photography, and other texts. Crosslisted as UNIV 236.

HEBR 251. The Jewish Uprooted. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
The course explores the figure of the uprooted in modern Jewish literature and culture, focusing on early 20th-century Hebrew, Yiddish, and Jewish-American writing (readings are in English). Crosslisted as UNIV 263.

HEBR 252. The Modern Jewish Experience in Lit&Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course explores modern Jewish life around the world through a variety of perspectives, including literature, film, history, and memoir. Emphasis is placed on Jews in Israel and the U.S., as well as on immigration and the Holocaust.

HEBR 292. After the Holocaust: Israel & United States. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course examines the impact of the Nazi persecution and genocide against the Jews (1933-1945) on different societies and cultures post-1945, especially in Israel and the United States. Crosslisted as UNIV 292.

HEBR 390. Independent Study. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies
Modern Hebrew at the intermediate level. Prerequisites: HEBR 102 and permission of the instructor.

Languages, Cultures & Linguistics

Faculty

Professors: Katherine M. Faull, Renée K. Gosson, Angèle M. Kingué (Associate Provost for Engagement & Inclusion), Bernhard Kuhn (ITAL Director), James E. Lavine (Chair, RUSS Director), Lisa A. Perrone (Teaching)

Associate Professors: Nathalie Dupont (FREN Director), Bastian Heinsohn, Martin Isleem (ARBC Director), Ludmila S. Lavine, Heidi Lorimor (LING Director), Anna Paparcone, Or Rogovin (HEBR Director), John Westbrook

Assistant Professors: Dena Isleem (Teaching), Lenora Murphy (Teaching), Rebekah Slodounik (GRMN Director)

Visiting Assistant Professor: Esra Arici

Adjunct Instructor: Nicole Warnock

- Linguistics (p. 197)
- Russian Studies (p. 201)

The mission of the Department of Languages, Cultures & Linguistics consists of engaging students with the linguistic, literary, historical, cultural and global dimensions of the languages taught in the department. Studying a new language provides a transformative learning experience and constitutes the foundation of a liberal arts education. It encourages students to perceive the world through others' eyes, and reflect upon and transcend their own cultural and linguistic background. In the process, students of language become more socially and cross-culturally aware and thus more empathetic leaders in today's global society. Students in linguistics examine the diversity in the world's languages and what all languages have in common through a systematic approach to investigating the nature of human language and the mechanisms underlying its acquisition, processing and use. Upon graduation, students in the department's constituent programs will have acquired competency and literacy in all areas of languages, cultures and linguistics that can be employed in a range of postgraduate learning environments and professional contexts at Bucknell and beyond.

Learning a foreign language contributes to a liberal education by providing performative exercises in cultural practices and linguistic concepts that open new perspectives on what it means to be human. Furthermore, foreign language courses allow access to world views expressed in the target language on their own linguistic and cultural terms, thus also making possible a more profound reflection of one's own source language and culture. The Department of Languages, Cultures & Linguistics' offerings at all levels investigate and analyze important interconnections among the histories, societies, cultures and languages of the people who speak Arabic, French, German, Hebrew, Italian and Russian, as well as offering students an introduction to American Sign Language and Deaf Culture. The curricula within the Department of Languages, Cultures & Linguistics assert the importance of attaining fluency not only in the target language but also in the nuances of interpreting the target language's literatures and other modes of cultural production.

The goal of the Department of Languages, Cultures & Linguistics is to allow students to achieve competency and literacy in the target language in order to employ that target language in a range of intellectual and professional contexts. The department's mission is firmly supported by the study of current thinking in linguistics where language is analyzed as a phenomenon in itself. Courses in linguistics link the study of human language to the cognitive underpinning of language acquisition and production in the source and target cultures.

The department offers courses in seven modern languages and in linguistics. Language courses are regularly offered in American Sign Language, Arabic, French, German, Hebrew, Italian, Russian, and in other Slavic languages (such as Ukrainian) on an occasional basis.

Coursework in all the programs is designed to promote a level of language proficiency and cultural understanding that will enable students to be active participants in a shrinking multicultural world. Each program's curriculum features a sequence of courses focusing on the development of language skills at the lower level, followed by a transition to upper-level courses that focus on the appreciation and critical analysis of a wide variety of literary and cultural works. As the Goals 2000 document of the National Standards in Foreign Language Education states: "Knowing another language system, another culture and communication strategies enables students to access new information and knowledge, develop insight into their own language and culture, and participate in multilingual communities and a global society."

Students are strongly encouraged to continue or begin the study of the language(s)/culture(s) of their choice as early in their undergraduate career as possible. Doing so will ensure the possibility of completing a major or minor in the language and will open the door to many stimulating study abroad programs. Many students find that the study of other languages and cultures provides a good background for work in other disciplines. In addition, by working to an advanced level of language proficiency and cultural awareness, students may improve their chances for a Fulbright or other international fellowship after graduation.

Placement: French, German, Italian & Russian

First-year students with prior instruction or background in French, German, Italian and/or Russian should take the online placement examination before arriving at Bucknell regardless of whether they have taken the AP exam or the SAT II. Information on accessing this exam is included in the first-year student registration materials. Any questions regarding placement should be directed to the program directors.

Placement: Arabic

First-year students with prior instruction or background in Arabic should contact the Arabic program director to consult about the appropriate placement level.

American Sign Language

Faculty

Adjunct Instructor: Nicole Warnock

American Sign Language (ASL), SIGN (as it's called at Bucknell), is taught to students with little or no knowledge of ASL and Deaf culture. SIGN provides students with the skills needed to communicate comfortably in a wide variety of situations. Discussions include basic finger-spelling techniques, ASL grammatical structures, non-manual markers and vocabulary. Emphasis is placed on developing proper expressive and receptive skills.

Necessary grammatical structuring is emphasized more heavily in level two, although it's a key component in level one so students understand how to produce grammatically correct ASL. Cultural information is taught throughout classes so students learn to feel comfortable interacting with the Deaf community in a way that is respectful and aware. Linguistic and social behaviors are vital for expressing oneself accurately in ASL. SIGN also explores current events and/or historical events about deafness or Deaf culture and students are encouraged to research these issues and reflect upon them. ASL is among the leading minority languages in the United States and this course explores the diverse ways students can apply their new knowledge of ASL in any career field.

Courses

SIGN 101. Elementary American Sign Language I. .5 Credits.
Offered Fall Semester Only; Lecture hours:2,Recitation:1
An introduction to American Sign Language (ASL) and the Deaf culture. Students with little or no prior knowledge of ASL will acquire essential grammar rules and a variety of vocabulary, enabling them to communicate effectively with the Deaf Community. Topics covered include finger-spelling, grammar, culture awareness, with an emphasis on expressive and receptive abilities.

SIGN 101A. Intensive Elementary American Sign Language. 1 Credit.
Offered Spring Semester Only; Lecture hours:4,Recitation:1
This intensive course covers the fundamentals of SIGN101 and SIGN102 in one semester. Students will expand their vocabulary with a wider range of essential signs while enhancing expressive and receptive skills, learning cultural protocols and the rules of ASL grammar and structure.

SIGN 102. Elementary American Sign Language II. .5 Credits.
Offered Spring Semester Only; Lecture hours:2,Recitation:1
Building upon the foundations established in SIGN 101, students will continue to expand their vocabulary while enhancing expressive and receptive skills, by incorporating more complex grammatical structures and engaging in advanced ASL dialogues. Prerequisite: SIGN 101 or equivalent.

SIGN 201. Intermediate American Sign Language. .5 Credits.
Offered Fall Semester Only; Lecture hours:2,Recitation:1
This course explores more complex grammatical structures, advanced classifiers, dialogues and storytelling techniques. It also examines social factors that influence cultural and sign variations and the cultural evolution throughout the Deaf community. Prerequisite: SIGN 101A or SIGN 102.

Arabic Studies

Faculty

Associate Professor: Martin Isleem (Director)

Assistant Professor: Dena Isleem (Teaching)

From a global perspective, the study of the Arabic language has become increasingly important and Arabic speakers are in great demand in certain careers. Approximately 300 million people speak Arabic, making it one of the world's most widely spoken languages. It is the official language of 25 countries, as well as one of the official languages of the United Nations. Moreover, being the sacred language of the Qur'an, Arabic honors a rich and ancient heritage that is culturally vibrant today.

Since 2006, the Arabic studies program at Bucknell University has been targeting the acquisition of the Arabic language and promoting familiarity with the world's Arab cultures, literatures and histories. Language courses offered at Bucknell consist of beginning and intermediate Arabic courses in Modern Standard Arabic (MSA) and Spoken Arabic, particularly the Levantine dialect. The growth of the Arabic studies program prompted the College of Arts & Sciences and the Department of Languages, Cultures & Linguistics to approve a minor in Arabic studies in 2013.

Arabic & Arab World Studies

The structure of the Arabic & Arab world studies major consists of three components of knowledge: language skills, cultural and interdisciplinary knowledge, and a culminating experience. The Arabic & Arab world studies major comprises nine credits: four language credits beyond ARBC 101; and four interdisciplinary credits, two of which must be from the Arabic studies program and two of which may be completed within the Arabic studies program or from other disciplines, such as international relations, political science, religious studies, philosophy, history, or art & art history. Finally, students majoring in Arabic & Arab world studies are required to complete a 1-credit, 300-level seminar in Arabic language or a 1-credit ARBC 300-level independent study project. This requirement will fulfill the College of Arts & Sciences Core Curriculum (CASCC) Culminating Experience.

Students placed in ARBC 103 due to prior Arabic exposure are expected to complete a minimum of three Arabic language credits beyond the placement and five interdisciplinary credits, two of which must be from the Arabic studies program and three of which may be completed within the Arabic & Arab world studies program or from other disciplines. In addition, a 1-credit, 300-level Arabic language seminar or independent study project is required.

A typical major in Arabic & Arab world studies would look like the following:

Language Proficiency

ARBC 102	Beginning Arabic II	1
ARBC 103	Intermediate Arabic I (prerequisite: ARBC 102 or equivalent)	1
ARBC 104	Intermediate Arabic II (prerequisite: ARBC 103 or equivalent)	1
ARBC 217	Advanced Arabic I (or any Arabic 200-level course and above)	1
ARBC 301	Advanced Topics in Arabic	1

Cultural & Interdisciplinary Courses totaling four credits. Two of the courses must be from the Arabic studies program. No more than two credits may come from any other department and only one of the four courses may be a 100-level course.

ARBC 110	Reading in Arabic	1
ARBC 120	Everyday Shami Arabic	1
ARBC 121	Arabic Conversation in Shami I	.5
ARBC 122	Arabic Conversation in Shami II	.5
ARBC 150	Topics in Arabic Studies	1
ARBC 201	Intermediate Arabic Conversation I	.5
ARBC 202	Intermediate Arabic Conversation II	.5
ARBC 205	Advanced Everyday Arabic	1
ARBC 206	Arabic Translation in the Age of AI	1
ARBC 218	Advanced Arabic II	1
ARBC 220	Transformations of Identities: The Arab Minority in Israel	1
ARBC 221	A Window into Middle Eastern Culture in Amman	1
ARBC 250	Topics in Arabic Studies	1
ARBC 251	Advanced Independent Study in Arabic	1
ARBC 260	Cinema in The Arab World	1
ARBC 261	Media, Power, and the Middle East	1
ARBC 301	Advanced Topics in Arabic (prerequisite: Advance II or equivalent; can be offered as an independent study as needed)	.5-1
ARBC 380	Independent Study in Arabic	.5-1
CLAS 244	Magic and Mystery of the Ancient Mediterranean World	1
HIST 100	Thinking about History (topic: ComicBook Histories Middle East)	1
HIST 255	Under Siege: The Modern Middle East 1914-2014	1
HIST 285	The Middle East in Global Perspective	1
HIST 290	Europe Imperialism and Colonialism	1
HIST 330	European History	1
HIST 399	Non-western History [1]	1
HUMN 260	Introduction to Translation Studies	1
IREL 229	Middle East Conflict and Revolution	1
PHIL 267	Arabic Philosophy	1
POLS 224	Government and Politics of the Middle East	1
POLS 266	Nationalism	1
POLS 290	Topics in Politics [1]	1
RELI 100	Introduction to Religion [1]	1
RELI 201	Islam	1
RELI 234	Issues of Religion and Culture (This course will be listed as an elective course only if offered under the title "RELI 234-02: Drinking Coffee, Tasting God: The Mystical Path of Islam")	1
RELI 256	Islam in America	1
RELI 260	Women, Gender, Islam	1

[1] This course will count as an elective course only if the majority of the course material focuses on Middle Eastern/Arab world topics.

Culminating Experience

1. Complete a seminar at the ARBC 300 level (one credit):

This seminar will focus on one of the following fields: Arabic literature, culture or linguistics. At the end of this seminar, students should submit a critical research paper with a summary in Arabic. The research paper will be presented as an oral presentation at a symposium organized by the Arabic studies program on campus.

Or

2. Complete a 1-credit ARBC 300-level independent study project successfully during senior year.
The project should result in a research paper combined with a summary of the project in Arabic as well as an oral presentation at a symposium organized by the Arabic studies program on campus. With the permission of the Arabic studies adviser during the second semester of junior year, students who are majoring in Arabic & Arab world studies may pursue an honors thesis in Arabic studies.

Satisfying the College of Arts & Sciences Core Curriculum (CASCC) Disciplinary Depth Goals

The fulfillment of the CASCC disciplinary depth goals for a bachelor in Arabic & Arab world studies is as follows:

1. Writing within the major ARBC 200-level courses, ARBC 300-level courses, independent study project in senior year, and all W2 courses listed in the cultural and interdisciplinary courses;
2. Information literacy in ARBC 200-level courses, ARBC 300-level courses, and independent study project in senior year;
3. Formal presentation as part of the culminating experience.

Arabic Studies - Study Abroad

The Arabic studies program at Bucknell does not yet have its own study abroad program. The Arabic studies program welcomes participants in other study abroad programs in any Arabic-speaking countries; no more than two of the study abroad courses may count toward fulfilling the Arabic & Arab world studies major requirements at Bucknell. Language courses and/or courses in Arabic literature, Arabic culture, Middle Eastern history, and the politics of the Middle East may be credited toward the major requirements. Study abroad courses toward the major must receive course approval from the director of the Arabic studies program before starting the study abroad program.

The Arabic studies minor consists of five courses. Students must complete the sequence of the core language courses through ARBC 104, plus additional coursework to reach a total of five credits toward the minor. The additional coursework may be taken in Arabic studies or other disciplines, such as international relations, political science, religion, philosophy and history. Students placed in ARBC 102 or ARBC 103 due to prior Arabic exposure but lack official credentials at the college level will need to enroll in additional courses to reach a total of five courses. These courses may be in Arabic language or/and interdisciplinary and cultural courses in Arab world studies, politics and history of the Middle East and Islamic studies. Three to four core courses:

ARBC 101	Beginning Arabic I	1
ARBC 102	Beginning Arabic II	1
ARBC 103	Intermediate Arabic I	1
ARBC 104	Intermediate Arabic II	1

One Elective course[1]:

ARBC 110	Reading in Arabic	1
ARBC 120	Everyday Shami Arabic	1
ARBC 121	Arabic Conversation in Shami I	.5
ARBC 122	Arabic Conversation in Shami II	.5
ARBC 201	Intermediate Arabic Conversation I	.5
ARBC 202	Intermediate Arabic Conversation II	.5
ARBC 205	Advanced Everyday Arabic	1
ARBC 221	A Window into Middle Eastern Culture in Amman	1
ARBC 250	Topics in Arabic Studies	1
ARBC 301	Advanced Topics in Arabic	.5-1
HIST 100	Thinking about History (The Question of Palestine)	1
HIST 290	Europe Imperialism and Colonialism	1
HIST 399	Non-western History (U.S. in the Middle East since 1945)	1
IREL 229	Middle East Conflict and Revolution	1
PHIL 267	Arabic Philosophy	1
POLS 224	Government and Politics of the Middle East	1
POLS 266	Nationalism	1
RELI 201	Islam	1

RELI 256	Islam in America	1
RELI 260	Women, Gender, Islam	1

[1] Two half-credit courses are considered as one course toward fulfilling the minor requirements.

Arabic minors are strongly encouraged to participate in approved study abroad programs in any Arabic-speaking country. No more than two of the study abroad courses may count toward fulfilling the Arabic minor requirements. Arabic minors who opt to apply for an Arabic study abroad program must receive course approval from the director of the Arabic studies program before starting the program.

Students interested in the minor should consult the director of the Arabic studies program for the appropriate sequencing of courses.

The goal of the Arabic major is to equip Bucknell students with definable linguistic proficiency in four skills: speaking, writing, listening and reading, which are in line with the American Council on the Teaching of Foreign Language's (ACTFL) Standards for the Arabic language. The major also aims to familiarize Bucknell students with the various cultural aspects of Arabic-speaking countries in the Middle East and North Africa. Students with an Arabic major will attain at least a high-intermediate level of proficiency in Arabic, which will furnish them with a solid foundation in their pursuit of academic and professional careers for which this is a prerequisite.

Students majoring in Arabic Studies will be able to:

1. Achieve at least a high-intermediate level of proficiency according to ACTFL standards and guidelines. (2, 4, 7, 8, 9)
2. Demonstrate proficiency in both Standard and Spoken Arabic by their ability to engage with native speakers of Arabic. An Oral Proficiency Interview (OPI) test will be conducted at the end of each academic year. (1, 3, 6, 7)
3. Understand customs, perspectives and gestures commonly found in various Middle Eastern cultures and compare them to their own. (3, 4, 5, 6, 7, 8, 9)
4. Implement their linguistic skills as well as their knowledge of the Arab culture outside the classroom setting. (2, 3, 9)
5. Apply knowledge of other disciplines in the course of their Arabic Studies minor, promoting exchanges of knowledge that enhance interdisciplinary education. (1, 2, 3, 4, 6, 7, 8, 9)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

ARBC 101. Beginning Arabic I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Beginning language skills. Practice in listening, speaking, reading and writing. Elementary grammar. Introduction to Arabic culture.

ARBC 102. Beginning Arabic II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Continuation of Arabic language skills. Practice in listening, speaking, reading, and writing. Prerequisite: ARBC 101 or equivalent.

ARBC 103. Intermediate Arabic I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
A continuation and review of basic grammar, emphasizing all four language skills and culture. Prerequisite: ARBC 101A or ARBC 102 or equivalent.

ARBC 104. Intermediate Arabic II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Review of basic grammar with an emphasis on all four language skills and culture. Prerequisite: ARBC 103 or equivalent.

ARBC 110. Reading in Arabic. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course aims to develop reading competence in Modern Standard Arabic (MSA), meaning this course is not designed to integrate the four-skill approach. The goal of the course is to reach proficiency of intermediate level in authentic MSA reading materials. Completing ARBC 101 is a prerequisite for this course.

ARBC 120. Everyday Shami Arabic. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will introduce students to intermediate everyday Arabic, specifically Palestinian dialect and cultures. This full-credit course is equal to the two half-credit ARBC 121 and ARBC 122 courses. Prerequisite: ARBC 102.

ARBC 121. Arabic Conversation in Shami I. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2
Concentration on development of speaking skills. Conducted entirely in Arabic. Prerequisite: ARBC 102. It is not open to students who have taken ARBC 120.

ARBC 122. Arabic Conversation in Shami II. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2
Concentration on development of speaking skills. Conducted entirely in Arabic. Prerequisite: ARBC 121. It is not open to students who have taken ARBC 120.

ARBC 150. Topics in Arabic Studies. 1 Credit.
Lecture hours:3; Repeatable
Study of topics in Arabic language, cultures, and societies.

ARBC 201. Intermediate Arabic Conversation I. .5 Credits.
Offered Fall Semester Only; Lecture hours:2
Concentration on development of speaking skills. Conducted entirely in Arabic by native speaker. Prerequisite: ARBC 102. Not open to students who have taken ARBC 205.

ARBC 202. Intermediate Arabic Conversation II. .5 Credits.
Offered Spring Semester Only; Lecture hours:2
Concentration on development of speaking skills. Conducted entirely in Arabic by native speaker. Prerequisite: ARBC 201. Not open to students who have taken ARBC 205.

ARBC 205. Advanced Everyday Arabic. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will introduce students to intermediate to advanced everyday Arabic, specifically Palestinian dialect and culture. Prerequisites: ARBC 104 and ARBC 120.

ARBC 206. Arabic Translation in the Age of AI. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course aims to familiarize students with Arabic language translation techniques and provide them with the necessary skills for translation between Arabic and English. The course's emphasis lies in exploring where and how traditional translation methods fit in the age of Artificial Intelligence (AI) and other computation tools.

ARBC 217. Advanced Arabic I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Designed to equip students with advanced intermediate competence in Modern Standard Arabic and spoken Arabic, targeting the skills of speaking, reading, writing, and listening. Prerequisite: ARBC 104 or by permission of the program director.

ARBC 218. Advanced Arabic II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Designed to equip students with advanced competence in Modern Standard Arabic and spoken Arabic, targeting the skills of speaking, reading, writing and listening. Prerequisites: students must have taken ARBC 217 or ARBC 250 if it was taught in Arabic and permission of the instructor.

ARBC 220. Transformations of Identities: The Arab Minority in Israel. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course aims to explore the evolving social and cultural changes in the Arab minority in Israel, and seeks to develop an understanding of the ongoing effects of globalization on a non- Western society.

ARBC 221. A Window into Middle Eastern Culture in Amman. 1 Credit.
Offered Summer Session Only; Lecture hours:3
This course aims to explore Jordan’s cultures and will consist of four components: twice-weekly class discussions, four lectures by local guest speakers, two community service opportunities and field trips. The course will cover interdisciplinary materials, such as History, Religious Studies, Cultural Studies, Gender Studies, Politics, Refugees Studies and Sustainability.

ARBC 250. Topics in Arabic Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of topics in Arabic language, cultures and societies. Prerequisites: ARBC 104 and permission of the instructor. This course can be taught in Arabic or English based on the program's needs.

ARBC 251. Advanced Independent Study in Arabic. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:3; Repeatable
This course is designed to build Advanced proficiency in Arabic.

ARBC 260. Cinema in The Arab World. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will survey various aspects of cinema in the Arab world from different periods in history. It will consider how cinema explores topics such as gender and sexuality, national identity, political conflicts, immigration and refugees, religious influence and censorship. This course will be offered in English.

ARBC 261. Media, Power, and the Middle East. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course seeks to critically analyze the discourse of the U.S. mass media and public policy decision-making toward Arabs and Muslims. The course aims to furnish students with knowledge about power, media, and discourse to build better global awareness of minorities and their human rights.

ARBC 301. Advanced Topics in Arabic. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Advanced Arabic independent study under the direction and supervision of an instructor. Topics to be selected by the student in consultation with the instructor. Prerequisites: ARBC 217 and permission of the instructor.

ARBC 380. Independent Study in Arabic. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Subject to be selected by student in consultation with the instructor. Prerequisites: ARBC 217 and permission of the instructor.

French & Francophone Studies

Faculty

Professors: Renée K. Gosson, Angèle M. Kingué (Associate Provost for Engagement & Inclusion)

Associate Professors: Nathalie Dupont (Director), John Westbrook

Assistant Teaching Professor: Esra Arici

Study French, one of the world's most influential languages spoken by approximately 300 million people on all continents, and learn to communicate persuasively, think critically, and engage with global society — skills needed for career success. Explore the literatures, cultures and societies of France, Francophone Africa, Québec, and the Caribbean from the Middle Ages through the 21st century. Gain cross-cultural awareness by studying French through cultural artifacts (literature, music, cinema and the visual arts) and social practices (history, gastronomy, business and politics). Learn how historical and sociocultural events inform gender, class, and race constructions and relations within French-speaking societies. Join our study abroad program in France.

The French & Francophone studies program offers a minor consisting of five courses and a rigorous and interdisciplinary major consisting of eight courses. The major is best seen as a progression of linguistic-cultural study organized in four stages. The 100-level courses focus on language proficiency in cultural context. The 200-level courses consolidate language skills while beginning a more interdisciplinary study of French and Francophone literatures and cultures. A year or semester in France provides direct experience in the French and Francophone cultures. The 300-level courses focus on specific critical approaches to topics in literature, civilization and cultural studies.

Students enrolled in French & Francophone studies have the opportunity to satisfy College of Arts & Sciences Core Curriculum requirements by taking required courses for the minor or major. All our offerings count as Arts & Humanities Division courses and our 200 and 300-level courses fulfill the Global Connections component of the core curriculum. In addition, French & Francophone studies majors will have the opportunity to take W2 courses in 200 and 300-level literature and civilization courses. Through thoughtfully articulated writing assignments, presentations, class discussions and information literacy workshops in the library, French & Francophone studies majors will hone their research and analytical skills. They will gain familiarity with discipline-specific journals and databases and learn to evaluate information sources. As they engage in the critical interdisciplinary thinking necessary for successful completion of the major, students will lay the foundation for independent lifelong learning.

Double Majors

Students will find that the skills they develop through the study of French and Francophone languages, literatures and cultures will complement wide ranging interests and career trajectories. Past French & Francophone studies majors have also majored in such disciplines as international relations, political science, psychology, biology, economics and management.

Recent graduates hold jobs in international organizations, design, investment banking, marketing and pharmaceuticals, and pursue advanced degrees in fields from statistics to education.

Online Placement Test

Students who have studied French in secondary school or who are heritage speakers of the language must take the online placement test to determine the level at which they may register for a French course. Information on accessing the test is included in the first-year student registration information. Current students may access the placement test from the French & Francophone studies program webpage. Any questions regarding placement should be addressed to the director of the French & Francophone studies program.

Transfer Credits

Students may normally transfer up to two credits for coursework equivalent to courses offered by the French & Francophone studies program. Students need to obtain approval from the French & Francophone studies program director; otherwise, credit is not guaranteed.

For the French & Francophone studies minor, no more than one of the five required courses may be taken for credit at another institution. Likewise, students need to obtain approval from the French & Francophone studies program director; otherwise, credit is not guaranteed.

French & Francophone Studies Major

The **major** in French & Francophone studies consists of a minimum of eight courses at the FREN 102 Exploring French level and above. At least two of these courses must be taken at the 300 level, and one of these must be taken during the senior year.

The major includes:

At least one pre-revolutionary France literature and/or civilization course in French at the 200 or 300 level. All topics courses must be pre-1789 subject matter. [1]		1
FREN 220	Women's Voices In Early Modern France	
FREN 230	French Literature I	
FREN 322	Medieval and/or Renaissance Studies	
FREN 323	Early Modern Worlds & Cultures	
At least one post-revolutionary France literature and/or civilization course in French at the 200 or 300 level. All topics courses must be post-1789 subject matter. [1]		1
FREN 231	French Literature II	
FREN 250	French Comics & Graphic Novels	
FREN 255	Introduction to French Cinema	
FREN 270	La France actuelle	
FREN 275	French Business Culture	
FREN 326	19th Century Through Empires & Revolutions	
FREN 327	The Making of Contemporary France	
At least one Francophone literature and/or civilization course in French at the 200 or 300 level. All topics courses must be Francophone subject matter. [1]		1
FREN 236	Topics in Francophone Literature and Culture	
FREN 336	Francophone Worlds	
5 additional FREN courses at or above the FREN 102 level. [1]		5

[1] The following topics courses may satisfy this requirement, pending approval by the program director: FREN 295 Topics in French or Francophone Studies, FREN 330 Topics in Literature, FREN 355 Topics in French and/or Francophone Cinema, FREN 370 Topics in Civilization, FREN 371 Topics in the Arts, FREN 395 Seminar in French or Francophone Studies. At least two of the eight major courses must be taken at the 300 level; one of these must be taken during the senior year.

Upon approval from the French & Francophone Studies Program director, majors may elect to take one course taught in English within or outside of the French & Francophone Studies Program (e.g., in history, English, anthropology, etc.) on a French/Francophone subject.

The following courses do not count for the major:

FREN 201	Intermediate French Conversation I	.5
FREN 202	Intermediate French Conversation II	.5
FREN 262	Intercultural Communication (When taking FREN 262 as 1 credit it may count toward the major.)	.5
FREN 301	Advanced French Conversation I	.5
FREN 302	Advanced French Conversation II	.5

All majors will complete a **Culminating Experience**: During the senior year (or second semester of the junior year with permission of their adviser and the program director), majors in French & Francophone studies will designate as their culminating experience one 300-level seminar on a French or Francophone topic taught by a faculty member in the French & Francophone Studies Program (FFSP). As part of the learning activities in that seminar, majors will undertake a paper or research project related to French or Francophone literature or culture. At the end of the semester, they will present the result in its final written form and as an oral presentation in French based on their research, preferably at a symposium organized by the FFSP on campus. These two components of the Culminating Experience (paper and presentation) must provide evidence of: 1) competency in written and oral communication through structured arguments using appropriate forms of textual, cultural and visual analysis and evidence, and 2) familiarity with critical approaches, academic research and methodology in the field of French & Francophone studies. A committee of French & Francophone studies faculty will evaluate these culminating experiences to determine whether they meet both of these learning objectives and thus satisfy the requirement. With the permission of the French & Francophone studies adviser, students who are taking an independent study or pursuing honors in French & Francophone studies may satisfy the culminating experience requirement through the successful completion of an independent study project or an honors thesis. However, in such cases, these students will still be required to make an oral presentation in French based on their research project or thesis to provide evidence for the two learning outcomes under examination, as stated above.

Study Abroad

All learners of French are strongly encouraged to study abroad in France in our own Bucknell *en France* (BEF) program, as we believe this immersion experience to be an integral part of language acquisition and the development of skills as culturally-competent citizens in an increasingly globalized world. Indeed, since its inception in 1987, the BEF program features rich, immersive experience grounded in a strong academic program targeting students at all levels of language proficiency, and has become a defining feature of the academic and personal experiences of most of our students, both majors and minors. Through BEF, the French & Francophone Studies Program is able to graduate highly qualified majors who are proficient in spoken and written French, who are able to understand and articulate positions on social, literary or cultural topics in a manner understandable to native speakers, and who have attained the linguistic and cultural proficiency necessary to function in a French-speaking academic or professional environment. Through courses offered at Bucknell and abroad, our majors and minors further develop transferable skills such as critical thinking, active learning, information literacy, writing and presentation skills. Students are encouraged to develop an appreciation for and sensitivity to cultural differences and the socio-cultural logic informing them to develop the basis for a self-reflexive approach to their future engagement in professional and communal life.

All courses taken from the BEF program may be counted toward the major as long as the courses are approved by the French & Francophone Studies Program director.

Up to two courses taken abroad from non-Bucknell-administered programs may be counted toward the major. Students need to obtain approval from the French & Francophone Studies Program director; otherwise, credit is not guaranteed.

Honors

French & Francophone studies majors are encouraged to write a senior thesis and to consider interdisciplinary topics which could link French & Francophone studies to their additional academic interests. In their junior year, students interested in pursuing honors in French & Francophone studies should contact a faculty member to discuss the process. Should the faculty member agree to mentor the student, they will take at least one independent study (FREN 390) during their senior year. This is in addition to the eight required courses for the major.

French & Francophone Studies Minor

The **minor** in French & Francophone studies consists of five courses *taught in French* at the FREN 101 Discovering French level and above, excluding:

FREN 201	Intermediate French Conversation I	.5
FREN 202	Intermediate French Conversation II	.5
FREN 262	Intercultural Communication (When taking FREN 262 as 1 credit it may count toward the minor.)	.5
FREN 301	Advanced French Conversation I	.5
FREN 302	Advanced French Conversation II	.5

Study Abroad

All learners of French are strongly encouraged to study abroad in France in our own Bucknell *en France* (BEF) program, as we believe this immersion experience to be an integral part of language acquisition and the development of skills as culturally-competent citizens in an increasingly globalized world. Indeed, since its inception in 1987, the BEF program features a rich, immersive, home-stay experience grounded in a strong academic program targeting students at all levels of language proficiency, and it has become a defining feature of the academic and personal experiences of most of our students, both majors and minors. Through BEF, the French & Francophone studies program is able to graduate highly qualified majors who are proficient in spoken and written French, who can understand and articulate positions on social, literary or cultural topics in a manner understandable to native speakers, and who have attained the linguistic and cultural proficiency necessary to function in a French-speaking academic or professional environment. Through courses offered at Bucknell and abroad, our majors and minors further develop transferable skills such as critical thinking, active learning, information literacy, writing and presentation skills. Students are encouraged to develop an appreciation for and sensitivity to cultural differences and the socio-cultural logic informing them to develop the basis for a self-reflexive approach to their future engagement in professional and communal life.

All courses taken from the BEF program may be counted toward the minor as long as the courses are approved by the French & Francophone studies program director.

One course taken abroad from non-Bucknell-administered programs may be counted toward the minor. Students need to obtain approval from the French & Francophone studies program director; otherwise, credit is not guaranteed.

Majors in French & Francophone studies will be able to:

1. Speak, read, write and understand French at an “advanced-low” level as defined by the proficiency criteria of the American Council on the Teaching of Foreign Languages (“ACTFL guidelines”) or the Common European Framework of Reference for Languages level B1 or higher. (7, 9)

2. Demonstrate an ability to analyze and interpret a wide variety of Francophone literary and cultural works, drawing on the disciplinary tools and critical methods of French & Francophone studies. (1, 2, 3, 7)

3. Demonstrate competency in written and oral communication through the production of persuasive texts and presentations supported by structured arguments that respect disciplinary norms for evidence and citation. (7)

4. Demonstrate research competency in French & Francophone literatures and cultures, through the application of appropriate academic research methodologies and the use of pertinent bibliographical and other sources related to coursework. (8)

5. Demonstrate the ability to synthesize learning across courses in French & Francophone studies in order to develop a global view of the discipline and to apply the knowledge and skills it promotes beyond the discipline. (2, 9)

Minors in our program will be able to:

1. Speak, read, write and understand French at an "intermediate-high" level as defined by the proficiency criteria of the American Council on the Teaching of Foreign Languages. (2, 3, 7, 9)

Numbers in parentheses reflect related Educational Goals (http://www.bucknell.edu/x50032.xml) of Bucknell University.

Courses

FREN 101. Discovering French. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Beginning language skills. Practice in listening, speaking, reading, and writing; elementary grammar; and introduction to French Francophone civilizations. Prerequisite: no more than two years of secondary school French or permission of the instructor.

FREN 102. Exploring French. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Continuation of language skills. Practice in listening, speaking, reading, and writing; grammar; readings in literature and civilization. Prerequisite: FREN 101 or one year of secondary school French.

FREN 103. Building Proficiency in French. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
A review of basic grammar emphasizing all four language skills and culture. Prerequisite: FREN 102 or equivalent (three years of secondary school French).

FREN 104. Communicating in Context. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Continuing review of basic grammar emphasizing all four language skills and culture. Prerequisite: FREN 103 or equivalent (more than four years of secondary school French).

FREN 1NT. French Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Nontraditional study in French.

FREN 201. Intermediate French Conversation I. .5 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Concentration on development of speaking skill. Conducted entirely in French by native speaker. Not open to students who have studied in France or other French-speaking countries. Intended for students enrolled in 200-level courses. Prerequisite: FREN 104 or equivalent. (Cannot be applied toward the French Francophone studies major or minor).

FREN 202. Intermediate French Conversation II. .5 Credits.
Offered Spring Semester Only; Lecture hours:2; Repeatable
Concentration on development of speaking skill. Conducted entirely in French by native speaker. Not open to students who have studied in France or other French-speaking countries. Intended for students enrolled in 200-level courses. Prerequisite: FREN 104 or equivalent. (Cannot be applied toward the French major or minor).

FREN 210. Building Bridges in French. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Application of major linguistic functions and acquisition of skills essential for 200-level courses through a series of contextualized writing and reading assignments. Prerequisite: FREN 104.

FREN 215. Advanced Intermediate French I. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies
Intensive French language study during the student's first month in Tours. Offered only in Tours, required of all students their first semester there. Prerequisite: FREN 104.

FREN 216. Advanced Intermediate French II. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies
Guided practice for the improvement of written and spoken French at the advanced intermediate level, and preparation for the DELF French proficiency exam. Offered only in Tours, required of all students their first semester there. Prerequisite: FREN 215.

FREN 217. Advanced French I. .5-1 Credits.
Offered Spring Semester Only; Lecture hours:Varies,Other:Varies
Intensive French Language study during first month of second semester in Tours. Offered only in Tours. Prerequisite: FREN 215.

FREN 218. Advanced French II. .5-1 Credits.
Offered Spring Semester Only; Lecture hours:Varies
Guided practice for the improvement of written and spoken French at the advanced intermediate level, and preparation for the DELF French proficiency exam. Offered only in Tours. Prerequisite: FREN 216.

FREN 220. Women's Voices In Early Modern France. 1 Credit.
Lecture hours:3; Repeatable
Introduction to history of French literature from the Middle Ages to the French Revolution (1789) with an emphasis on women writers and women's lived experiences and/or literary representations. Provides an introduction to literary history and methods of critical reading. Prerequisite: FREN 104.

FREN 230. French Literature I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to history of French literature prior to the French Revolution (1789). Provides an introduction to literary history and methods of critical reading. Prerequisite: FREN 104.

FREN 231. French Literature II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to history of French literature of the 19th century to the present and to methods of critical and literary analysis. Prerequisite: FREN 104.

FREN 236. Topics in Francophone Literature and Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of the literature, language, geography, history, music, and film of a particular Francophone region (French Caribbean, Quebec, West Africa, Maghreb, etc.). Prerequisite: FREN 104.

FREN 250. French Comics & Graphic Novels. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course serves as an introduction to comic books and graphic novels in French from the 19th century to the present. Students will examine the socio-historical contexts in which this popular medium was born and how it has evolved thematically and stylistically into a recognized art form. Prerequisite: FREN 104.

FREN 255. Introduction to French Cinema. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to French cinema from a cultural and historical perspective. Students will familiarize themselves with major cinematic movements and with methods of critical analysis. The course also includes discussions of the relationships between film, literature and other visual arts. Prerequisite: FREN 104.

FREN 261. Translation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to translation. Prerequisite: FREN 104.

FREN 262. Intercultural Communication. .5-1 Credits.
Offered Occasionally; Lecture hours:3
This course is intended to provide a foundation in intercultural communication theory with specific application to the French and American cultures. Offered only in Tours.

FREN 270. La France actuelle. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to contemporary France from historical, sociological, anthropological, and symbolic perspectives. The study of French attitudes, lifestyles, conceptions of society, social and political structures, and of France and French in a post-colonial context. Prerequisite: FREN 104.

FREN 275. French Business Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
In-depth study of the language, culture, politics, and economic climate of business in France. Preparation for further study of management and internships in France. Prerequisite: FREN 104.

FREN 282. Patrimoines gastronomiques. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Introduction to food practices in France from historical, sociological, anthropological, and symbolic perspectives. Studies conceptions of society through gastronomic discourse. Bucknell en France only. Prerequisite: FREN 104.

FREN 290. Independent Study. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:1; Repeatable
Independent study in French. Subject to be selected by student in consultation with the instructor. Prerequisite: permission of the instructor.

FREN 295. Topics in French or Francophone Studies. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Topics vary but permit study of one or several subjects in French or Francophone literature, culture and civilization. Prerequisite: FREN 104.

FREN 301. Advanced French Conversation I. .5 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Advanced conversation for students who have studied in France or other French-speaking countries. Conducted entirely in French by native speaker. May not be taken by native speakers of French. (Cannot be applied toward the French Francophone studies major or minor.) Prerequisite: FREN 104.

FREN 302. Advanced French Conversation II. .5 Credits.
Offered Spring Semester Only; Lecture hours:2; Repeatable
Advanced conversation for students who have studied in France or other French-speaking countries. Conducted entirely in French by native speaker. May not be taken by native speakers of French. (Cannot be applied toward the French Francophone studies major or minor.) Prerequisite: FREN 104.

FREN 322. Medieval and/or Renaissance Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Examination of the literature of the medieval and/or Renaissance periods emphasizing the analysis of themes, ideas, and styles as well as cultural and historical contexts. Prerequisite: FREN 104.

FREN 323. Early Modern Worlds & Cultures. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary, but examine key historical moments, as well as social-political, philosophical and cultural components of France (or areas where French is spoken in Africa, the Caribbean, Europe, and North America) from the Renaissance (16th century) through the Siècle des Lumières (18th century). Prerequisite: FREN 104.

FREN 326. 19th Century Through Empires & Revolutions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary, but examine through diverse cultural productions the major political, economic, social, and cultural transformations of France between Napoleon's First Empire and l'esprit fin-de-siècle. Prerequisite: FREN 104.

FREN 327. The Making of Contemporary France. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary, but examine through diverse cultural productions the major events, social movements, and ideologies that have shaped 20th- and/or 21st-century France, engaging with a selection of critical issues such as war and society, gender roles and rights, environmental politics, race and ethnicity, immigration and multiculturalism. Prerequisite: FREN 104.

FREN 330. Topics in Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced study of themes or topics in French or Francophone literature. Prerequisite: FREN 104.

FREN 336. Francophone Worlds. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced study of literature, film, politics and society of diverse Francophone worlds and cultures. Prerequisite: FREN 104.

FREN 355. Topics in French and/or Francophone Cinema. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced study in themes, topics or periods in French and/or Francophone cinema.

FREN 370. Topics in Civilization. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced study in themes, topics, or periods in French or Francophone history or civilization. Prerequisite: FREN 104.

FREN 371. Topics in the Arts. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced study in themes, topics, or periods of French art history. Prerequisite: FREN 104.

FREN 390. Independent Study. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Subject to be selected by student in consultation with the instructor. Prerequisite: permission of the instructor.

FREN 395. Seminar in French or Francophone Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics vary, but permit detailed study of any one of innumerable subjects in French or Francophone literature and civilization. Prerequisite: FREN 104.

FREN 3NT. French Non-traditional Study. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in French.

German Studies

Faculty

Professor: Katherine M. Faull

Associate Professor: Bastian Heinsohn

Assistant Professor: Rebekah Slodounik (Director)

German studies provides an integrated and interdisciplinary approach to the study of German language, the analysis of artifacts of German culture – literature, art, music, film, etc. – and the use of German for special purposes, for example, in a business setting.

Coursework in the discipline combines the achievement of greater language proficiency in the areas of reading, writing, speaking and listening with a knowledge of German culture and methods of critical interpretation. There have been major thinkers in almost every field, from physics to philosophy, economics and psychology, who were German speakers. In the 21st century, Germany contributes significantly to political, cultural and economic developments in Europe. German studies also furthers critical thinking skills while fostering cross-cultural understanding and cultural humility.

The German studies program has as its goal that all majors achieve an intermediate-high to advanced-low proficiency in the areas of linguistic and cultural knowledge. German majors can communicate in everyday life in a German-speaking country and can understand and articulate positions on social, literary or cultural topics with a reasonable amount of linguistic accuracy. As students progress through the major, they learn various theoretical approaches to the interpretation of cultural artifacts and progress in their German language skills to acquire the vocabulary and syntax necessary to express more complicated ideas and concepts. In general, students' comprehension skills, reading and listening, are further developed than their production skills, speaking and writing, when finishing the major. Additional aspects inherent to this goal include increasing students' understanding of the way in which cultural artifacts (literature, film, theatre, music, art, advertising, etc.) are embedded in a historical context that determines gender, class and race relations within the target culture(s). Simultaneously, comparisons and contrasts are made in regard to the learners' own cultural background(s) in order to foster cross-cultural understanding.

All German majors will work on developing their skills in writing by taking one writing-intensive (W2) course: GRMN 204 Introduction to German Studies. In addition, every course in the major will include a variety of writing assignments, response papers, arguments in regard to a specific question, and/or research papers. In every course a student completes as part of the major, students will give at least one oral presentation (either individually or in a group). All of the courses that count toward the major are discussion-oriented so students get plenty of opportunities to develop their abilities to articulate their interpretation of the material at hand, to ask questions of others, and to respond to questions. The oral and written work will require students to consult online German resources, scholarly journals and other print materials. In GRMN 204 Introduction to German Studies, students will receive discipline-specific instruction on how to locate, evaluate and use scholarly information in the interdisciplinary field of German. These skills will be reviewed and refined in other 200-level and 300-level courses.

A major in German pairs well with students who are studying engineering or business. In combination with other majors in the College of Arts & Sciences, such as economics, neuroscience, and international relations, a German major can prepare one for a career in international business, law or in the foreign service. A major in German may provide the basis for graduate work within the field. Moreover, German is considered a useful second language in many disciplines in the humanities, such as philosophy and art history.

Major in German

The **major** in German consists of the equivalent of seven full-credit courses at the GRMN 104 level and above plus one .25-credit Culminating Experience course.

Conversation and Composition		
GRMN 104	Communicating in Context	1
GRMN 104R	Recitation for GRMN 104	0
Introduction to German Studies		
GRMN 204	Introduction to German Studies	1
GRMN 204R	Introduction to German Studies Recitation	0
German Cultural Issues		
Select at least two of the following:		1
GRMN 276	German Jewish Identities	1
GRMN 278	Sports in German Culture	1
GRMN 251	Achtung Kamera	1
GRMN 269	Germany in Film and Television	1
GRMN 270	The Bourgeois Era: 19th-century Germany	1
GRMN 271	Princesses, Devils, Witches: Fairy tales in a German Context	1
GRMN 272	Modern German Culture 1945-1990	1

GRMN 273	Germany Today	1
GRMN 274	Holocaust Literature	1
GRMN 275	Transnational Culture in Germany	1
GRMN 277	Memory and Memorials in a German Context	1
GRMN 295	Topics in German Studies	1
German Cultural Issues (advanced 300 level)		
Select two of the following:		
GRMN 390	Independent Projects in German Studies	.5-1
GRMN 391	Culture of the Weimar Republic	1
GRMN 393	Advanced Seminar in Selected Cultural Topics	1
Culminating Experience		.25

Courses not applicable to the major:

GRMN 201	Advanced Conversational German (Fall semester)	.5
GRMN 202	Advanced Conversational German (Spring semester)	.5

The Culminating Experience in German studies can be fulfilled by either:

- writing an honors thesis in German studies, or
- enrolling in a .25 course in their senior year that results in a presentation at the annual German studies mini-conference.

German majors are strongly urged to participate in a study abroad program approved by Bucknell's German studies program. The benefits of such a total immersion experience in attaining linguistic and cultural proficiency cannot be overemphasized. Many abroad programs also offer internship experiences. Students interested in study abroad should consult the faculty of the German studies program at the earliest possible date.

All majors who meet the requirements set by the Honors Council and who wish to earn honors in German are encouraged to do so. Students interested in writing an honors thesis should contact a German faculty member early in the second semester of their junior year to discuss the process and to define a topic.

German majors and minors should supplement their study of German with work in other languages, European history, art history, music, philosophy, or work in European political science and economics.

Students planning to teach German at the secondary level should consult with the German studies program and Bucknell's Department of Education as soon as possible.

Minor in German

German Minor

The **minor** in German consists of the equivalent of five full-credit courses at the GRMN 101 level or above. There are no other specific course requirements for the minor. Students interested in minoring in German should consult a German studies program faculty member for the appropriate sequencing of courses.

Courses that may count toward the minor in addition to any of the other GRMN courses:

GRMN 201	Advanced Conversational German	.5
GRMN 202	Advanced Conversational German	.5

German minors also are strongly encouraged to participate in an approved study abroad program.

Majors in German Studies will be able to:

1. Speak, read, write and understand German at an "Advanced-Low" level as defined by the proficiency criteria of the American Council on the Teaching of Foreign Languages ("ACTFL guidelines"). [University Educational Goals: 3, 7, 9]
2. Demonstrate familiarity with cultural artifacts produced in German-speaking countries from the 18th to the 21st century. [University Educational Goals: 3, 4, 5, 9]
3. Demonstrate the ability to adapt to a living/learning/work situation in a German-speaking country. [University Educational Goals: 2, 3, 4, 5, 9]
4. Demonstrate competency in written and oral communication through the production of analytical texts and presentations supported by structured arguments that demonstrate knowledge of the historical context and use appropriate forms of textual, cultural and visual analysis and evidence. Such texts and oral presentations will respect disciplinary norms for evidence and citation. [University Educational Goals: 1, 2, 3, 6, 7, 8, 9]

5. Demonstrate the ability to synthesize learning from within and outside German studies in order to develop a global view of the discipline and how the knowledge and skills it promotes can be applied beyond Bucknell. [University Educational Goals: 2, 3, 6, 9]

Minors in German Studies who begin in GRMN 101 will be able to:

1. Speak, read, write and understand German at an intermediate-mid level according to ACTFL guidelines. [University Educational Goals: 3, 7, 9]

Minors in German Studies who begin in GRMN 103 will be able to:

1. Speak, read, write, and understand German at an intermediate-high level according to ACTFL guidelines. [University Educational Goals: 3, 7, 9]

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

GRMN 101. German in Everyday Life - elementary level I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Beginning language skills. Practice in listening, speaking, reading, and writing; elementary grammar; and introduction to German culture.

GRMN 102. German in Everyday Life - elementary level II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Continuation of language skills. Practice in listening, speaking, reading, and writing; grammar; reading in culture and literature. Prerequisite: GRMN 101 or equivalent.

GRMN 103. Building Proficiency in German. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
A continuation and review of basic grammar, emphasizing all four language skills and culture. Prerequisite: GRMN 102 or equivalent.

GRMN 104. Communicating in Context. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Review of basic grammar, emphasizing all four language skills and culture. Prerequisite: GRMN 103 or equivalent.

GRMN 201. Advanced Conversational German. .5 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Concentration on development of speaking skills. Conducted in German. Intended for students enrolled in GRMN 104 or above. Prerequisite: GRMN 103 or equivalent.

GRMN 202. Advanced Conversational German. .5 Credits.
Offered Spring Semester Only; Lecture hours:2; Repeatable
Concentration on development of speaking skills. Conducted in German. Intended for students enrolled in GRMN 104 or above. Prerequisite: GRMN 103 or equivalent.

GRMN 204. Introduction to German Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
This course introduces students to the multifaceted, interdisciplinary world of German Studies. Essay writing and conversation practice. Prerequisite: GRMN 104 or equivalent.

GRMN 241. Germans and the World: Colonization, Emigration, Exile. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Focuses on recorded experiences of German-language writers, poets, playwrights and filmmakers outside geographical boundaries of German states from 18th-21st C. Introduces concepts of cross-cultural exchange, linguistic assimilation, artistic synthesis and critical analysis of the writer's new cultural and linguistic context and the critical lens that is turned back on Germany. Crosslisted as HUMN 241.

GRMN 251. Achtung Kamera. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:2
This course is an introduction to German film studies. It provides a survey of German films from the beginning until today. Prerequisite: GRMN 204.

GRMN 269. Germany in Film and Television. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores German cinema and television from its beginnings to today and examines how feature films and television series and shows reflect the socio-cultural and political developments in Germany in the 20th and 21st century. Taught in German.

GRMN 270. The Bourgeois Era: 19th-century Germany. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
An overview of German society from Romanticism to World War I from a cultural-historical perspective.

GRMN 271. Princesses, Devils, Witches: Fairy tales in a German Context. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of the genre of fairy tales in German culture with an emphasis on the Brothers Grimm and their adaptations of an oral folklore tradition, beginning in the nineteenth century into the twenty-first. In German. Prerequisites: GRMN 204 or equivalent.

GRMN 272. Modern German Culture 1945-1990. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
An overview of cultural, social, economic, and political issues in the two Germanys. In German. Prerequisite: GRMN 204 or equivalent.

GRMN 273. Germany Today. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Exploration of the cultural world of Germany since unification including literature, art, film, music. In German. Prerequisite: GRMN 204 or equivalent.

GRMN 274. Holocaust Literature. 1 Credit.
Lecture hours:3
Exploration of literary responses to the Holocaust, ranging from memoirs published immediately after the Holocaust to texts written in the twenty-first century. In English. No prerequisites. Open to first-years, sophomores, juniors and seniors.

GRMN 275. Transnational Culture in Germany. 1 Credit.
Lecture hours:3
Exploration of the periods of migration to Germany in a broader social, political and historical context, with an emphasis on migration in the twentieth and twenty-first centuries. In German. Prerequisite: GRMN 204.

GRMN 276. German Jewish Identities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Exploration of German Jewish literature and culture from the early twentieth-century to contemporary Jewish life in Germany today. Taught in English or German. If in English, no prerequisites. If in German, prerequisite GRMN 204 or equivalent.

GRMN 277. Memory and Memorials in a German Context. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Exploration of the processes of memory and memorialization in German culture, with an emphasis on the twentieth and twenty-first century. In English or German. If English, no prerequisites. If German, prerequisites GRMN 204 or equivalent.

GRMN 278. Sports in German Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the role of sports in German culture in the twentieth and twenty-first century. In German. Prerequisites GRMN 204 or equivalent.

GRMN 279. Never Again?: Antisemitism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores antisemitism, yesterday and today, through a variety of texts and provides students with the opportunity to learn about the history of antisemitism in order to become more informed and critically aware of current instances of antisemitism. In English. Crosslisted as HUMN 279.

GRMN 280. New German Cinema. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the influential film movement that took place in Germany from the 1960s to the 1980s. A new generation of filmmakers confronted the legacy of fascism and addressed taboo topics surrounding guilt and the trauma of violence in new visual language. The movement helped shape a new self-aware German identity through its films. Crosslisted as ENFS 232.

GRMN 295. Topics in German Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of topics in German culture or literature at an intermediate level. Prerequisite: GRMN 204 or concurrent enrollment.

GRMN 320. German Architectural Ideas. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will expose students to a range of design principles and debates about urban planning as they have shaped communities and life in German-speaking areas outside the USA from the eighteenth to twenty-first centuries.

GRMN 390. Independent Projects in German Studies. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Subject to be selected by the student in consultation with the instructor. Prerequisite: permission of the instructor.

GRMN 391. Culture of the Weimar Republic. 1 Credit.
Offered Occasionally; Lecture hours:3
A study of the history, economy, politics, and culture of the Weimar Republic. In German. Prerequisite: GRMN 270 or GRMN 272 or GRMN 273 or equivalent.

GRMN 393. Advanced Seminar in Selected Cultural Topics. 1 Credit.
Offered Alternate Fall and Spring; Lecture hours:3; Repeatable
The course will deal with selected topics in German culture on an advanced level. In German. Prerequisites: GRMN 270 or GRMN 272 or GRMN 273 or equivalent and permission of the instructor.

GRMN 395. Topics in German Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Study of topics in German culture or literature at an advanced intermediate level.

GRMN 419. Culminating Experience. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies
Independent study with a faculty member to prepare an oral presentation for annual German Studies Mini-Conference. Prerequisite: permission of the instructor.

Italian Studies

Faculty

Professors: Bernhard Kuhn (Director), Lisa A. Perrone (Teaching)

Associate Professor: Anna Paparcone

The Italian studies program offers a major and a minor in Italian studies. In addition to focusing on developing students' fluency in Italian, students gain a broad understanding of Italy's unique culture and its intellectual and artistic past. Students acquire the linguistic skills and cultural knowledge necessary to successfully function in an Italian environment. It is our goal to provide a transformative experience, which encourages students to step outside their comfort zone, linguistically and culturally, to gain intercultural competence and become global citizens.

Residence abroad is the best way to gain proficiency in the language and knowledge of the culture. A semester or year abroad in Italy is strongly recommended and a variety of opportunities is available. Students wishing to study in Italy are encouraged to contact the director of the Italian studies program as early as possible to discuss the various options.

Italian Studies Major

The Italian studies major targets the acquisition of the linguistic and cultural skills necessary to communicate in Italian at an advanced-low level. The major is intended to offer students access to the Italian culture, which has been vital to the development of our global society, and to assist them in developing a new perspective on our rapidly changing world. Italian studies majors will also develop skills in writing, speaking and information literacy throughout their studies.

The **major** in Italian studies requires seven courses (equivalent to seven full-credit courses) starting with ITAL 104 Intermediate Italian II: Italian Civilization or above. It combines language proficiency, cultural knowledge and a Culminating Experience. The specific requirements for each of these components are listed below.

Language Proficiency

Students majoring in Italian studies will gain at least an advanced-low level of language proficiency in Italian (according to the ACTFL guidelines). The major in Italian studies requires the completion of ITAL 205 Discovering Italy. This course concentrates on the development of skills in writing, speaking and information literacy.

Cultural Knowledge

Students majoring in Italian studies will gain familiarity with significant cultural aspects and artifacts of Italy. The major requires at least four courses related to Italy taught in Italian or English. It is strongly recommended that at least one of these content courses be taught in Italian. These courses are offered either by the Italian studies program, by other programs or departments at Bucknell, or by an accepted study abroad program in Italy.

Culture courses at the 200 and 300 level offered by the Italian studies program (in addition to ITAL 205 Discovering Italy) include:

ITAL 201	Intermediate Italian Conversation I [1]	.5
ITAL 202	Intermediate Italian Conversation II [1]	.5
ITAL 206	Exploring Italian Identity	1
ITAL 207	Eureka! Italy and the Sciences	1
ITAL 208	Italian Culture & the Environment	1
ITAL 295	Topics in Italian Studies (either in Italian or English)	1
ITAL 380	IL Mezzogiorno: Culture of Southern Italy	1
ITAL 385	Corsets and Curses	1
ITAL 395	Advanced Topics in Italian Studies	1
ITAL 390	Independent Study [2]	.5-1

[1] Each may be counted only once toward the major.

Courses related to Italy offered by other programs or departments at Bucknell include:

CLAS 132	Roman Civilization	1
CLAS 236	The Age of Augustus	1

CLAS 243	Archaeology of Rome	1
CLAS 262	Life in Ancient Pompeii	1
HIST 241	Roman History	1
LATN 101	Introductory Latin [2]	1
LATN 102	Introductory Latin [2]	1
LATN 200	Intermediate Latin [2]	1

[2] Only one course in LATN may be counted.

Culminating Experience

The major in Italian studies includes a Culminating Experience. The Culminating Experience draws together the skills, knowledge and experiences a student gained during their studies of Italian language and culture. This Culminating Experience component of the major may be fulfilled during the student's senior year in two ways:

- Any 300-level course offered by the Italian studies program (that has not been counted toward the cultural knowledge component). All writing requirements of the course must be completed in Italian.
- An independent study resulting in a thesis or comparable product.

Study Abroad

Study abroad at a full immersion program is the best way to gain proficiency in the language and knowledge of the culture. Students may count up to three credits toward the major (up to four if the student chooses to study abroad for a year) from a full immersion study abroad program approved by Bucknell's Italian studies program. Students studying at a non-immersion study abroad program in Italy may count up to two of the courses taken there toward their major after consultation with and approval of the Italian studies program. The courses taken abroad may be counted toward the language proficiency requirement as well as toward the cultural knowledge component of the major. ITAL 205 Discovering Italy must be taken at Bucknell.

Italian Studies Minor

The **minor** in Italian studies consists of a minimum of five course credits. All courses offered by the Italian studies program count toward the minor. One of the following courses is required for the minor: ITAL 205 Discovering Italy, ITAL 206 Exploring Italian Studies, ITAL 207 Eureka! Italy and the Sciences or ITAL 208 Italian Culture & the Environment. All additional courses counting toward the major may be counted toward the minor as well.

- Those students studying in Italy for a semester or year may count up to two of the courses taken there toward their minor after consultation with and approval of the Italian studies program.

ITALIAN STUDIES: Learning Outcomes

These numbers represent the university learning goals to which the Italian studies program learning outcomes are connected.

I. **Communication** learning outcome: speak, read, write, understand and *communicate* in Italian at an advanced-low level according to ACTFL guidelines. (3, 7, 9)
II. **Culture** learning outcome: show level-appropriate *cultural* competency in Italian civilization, and perform accurate research in Italian literature or cultural studies. (1, 3, 8)
III. **Comparison** learning outcome: use concepts and tools of inquiry to *compare* Italian language, social experiences, and cultural products with those of one's own culture in order to develop a culturally decentered point of view and demonstrate progress toward intercultural competence. (1, 3)
IV. **Connections** learning outcome: relate knowledge of another discipline to the course of the Italian studies major, fostering a *connection* between areas of study. (2)
V. **Community** learning outcome: use linguistic and cultural knowledge of Italy within and beyond the classroom setting, enabling an engagement in professional and *communal* life. (5, 9)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

ITAL 101. Elementary Italian I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Beginning language skills, practice listening, speaking, reading, and writing; elementary grammar; and introduction to Italian culture.

ITAL 102. Elementary Italian II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Continuation of language skills. Practice in listening, speaking, reading and writing. Introduction to Italian culture. Prerequisite: ITAL 101 or equivalent.

ITAL 103. Intermediate Italian I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Review and expansion of language skills and cultural knowledge of Italy. Prerequisite: ITAL 102 or equivalent.

ITAL 104. Intermediate Italian II: Italian Civilization. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Continuing review of grammar emphasizing all four skills. Focus on civilization. Prerequisite: ITAL 103 or equivalent.

ITAL 201. Intermediate Italian Conversation I. .5 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Concentration on development of speaking skills. Conducted in Italian by native speaker. This course can be counted only once toward the major or the minor. Prerequisite or corequisite: ITAL 104 or equivalent.

ITAL 202. Intermediate Italian Conversation II. .5 Credits.
Offered Spring Semester Only; Lecture hours:2; Repeatable
Concentration on development of speaking skills. Conducted in Italian by native speaker. This course can be counted only once toward the major or the minor. Prerequisite or corequisite: ITAL 104 or equivalent.

ITAL 205. Discovering Italy. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Introduction to Italian culture. Intensive practice in speaking and writing Italian. Prerequisite: ITAL 104 or equivalent.

ITAL 206. Exploring Italian Identity. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Examination of artistic products of cultural expression, such as literature, opera, film. Focus on developing a critical approach to the reading of texts. Prerequisite or corequisite: ITAL 104 or equivalent.

ITAL 207. Eureka! Italy and the Sciences. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course is taught in Italian. It will consider the development of science in the west and its impact on Italian culture. The focus will be on the intersection of scientific and humanistic perspectives. Coursework will include reading, writing, and short presentations in Italian. Prerequisite: ITAL 104 or equivalent.

ITAL 208. Italian Culture & the Environment. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Discussing literary texts, art works and films from different time periods. This course aims at exposing students to the relationship of Italian culture with the environment, the anthropocene and its effects and post-humanism as a product of current environmental problems. Prerequisite: ITAL 104.

ITAL 248. Intermediality: Italy, Film, and the Arts. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
This IP course will focus on intermediality, film, and Italy. It seeks to examine the relationships of cinema with the other arts, in particular the arts of Italy. Crosslisted as UNIV 248.

ITAL 295. Topics in Italian Studies. 1 Credit.
Offered Spring Semester Only; Lecture hours:3; Repeatable
Study of topics in Italian culture, literature, and/or civilization.

ITAL 380. IL Mezzogiorno: Culture of Southern Italy. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3,Other:3
Study of the culture and society of southern Italy. Sources of inquiry include literature, film, and music. Prerequisite: ITAL 104.

ITAL 385. Corsets and Curses. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
This course aims at exploring the contributions of Italian women writers, musicians and filmmakers to Italian culture in different cities. It will take into account different time periods and will relate them to give a complete picture of Italian feminist thought. Prerequisite: ITAL 104.

ITAL 390. Independent Study. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Subject to be selected by student in consultation with the instructor. Prerequisite: permission of the instructor.

ITAL 395. Advanced Topics in Italian Studies. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3; Repeatable
Advanced study of themes or topics in Italian culture, literature, and/or civilization.

Linguistics

Faculty

Professor: James E. Lavine

Associate Professor: Heidi Lorimor (Director)

Affiliated Faculty: Hiram L. Smith (Spanish)

Linguistics is the study of the human language faculty. It requires the investigation of a highly structured system of knowledge within the mind of the speaker (a mental grammar), which is examined empirically and modeled formally. Linguists seek to establish the general principles governing the organization, emergence and use of language, including a model of how languages vary across space and time. Language is treated as a natural object, like other cognitive faculties, serving as a natural point of entry into scientific discovery and the tools of scientific reasoning, such as pattern recognition, experimental design, and hypothesis construction and testing. Linguistics serves as a "bridge" discipline between the sciences and the humanities because language is at the center of humanistic inquiry, from philosophy and history to literary theory and language and cultural studies.

Linguistics Major

The **major** in linguistics includes a two-semester introductory sequence, intermediate work in theoretical grammar, intermediate work in the cognitive mechanisms of language, an advanced seminar and two electives, as outlined below. Research opportunities are available within the major.

The requirements for the major are as follows:

May be taken in any order.		
LING 105	Linguistic Analysis: Sounds and Words	1
LING 110	Linguistic Analysis: Sentences and Dialects	1
Three 200-level courses, one of each pair:		
LING 205	Phonetics and Phonology	1
or LING 206	Morphology	
LING 215	Syntax	1
or LING 216	Semantics	
LING 230	Psycholinguistics	1
or LING 237	Introduction to Language Development	
Select two of the following:		2
Any linguistics course offered in addition to:		
PSYC 288	Advanced Methods in Language	
SPAN 339	Topics in Hispanic Linguistics	
Select one of the following:		1
LING 315	Advanced Syntax [1]	
LING 325	Language and the Brain [1]	
LING 330	Advanced Topics in Psycholinguistics [1]	
LING 340	Typology and Universals [1]	

[1] Fulfills the Culminating Experience.

The Culminating Experience draws together and integrates the knowledge and analytical methods mastered by majors in the course of their study. It is satisfied by taking one seminar, either LING 315 Advanced Syntax, LING 325 Language and the Brain, LING 330 Advanced Topics in Psycholinguistics or LING 340 Typology and Universals, normally in the spring of the senior year. These 300-level seminars are designed to investigate one area in depth while highlighting interactions between this area and other sub-disciplines studied in the course of the major.

Linguistics Minor

The linguistics **minor** consists of five courses.

LING 105	Linguistic Analysis: Sounds and Words	1
LING 110	Linguistic Analysis: Sentences and Dialects	1
Three 200 or 300-level linguistics courses		3

Majors in Linguistics will be able to:

1. Analyze linguistic structures for the major grammatical modules: phonetics, phonology, morphology, syntax, and semantics (1, 2, 6, 9)
2. Demonstrate a basic understanding of allied fields in linguistics, including how languages are learned (acquisition), how languages change (historical linguistics), how language varies by social group (sociolinguistics), and how language is represented in the brain (neurolinguistics) (1, 2, 6, 9)
3. Describe theoretical approaches to language, and apply those linguistic theories to data from a typologically diverse set of languages (1, 2, 6, 7, 9)

4. Develop proficiency in experimental techniques for the study of language, and determine how those experimental results inform models of how language is learned, perceived, comprehended, or produced (1, 2, 6, 8, 9)
5. Apply specialized linguistic knowledge to a range of societal issues, including the complex relation between language and identity construction, language prejudice, and, in particular, how language ideologies perpetuate linguistic discrimination (3, 4, 5)
6. Develop the ability to write and present orally according to the norms of the discipline (6, 7, 8)
7. Perform sophisticated linguistic analysis in one subfield of linguistics (e.g., syntax, psycholinguistics, neurolinguistics, or language typology) (1, 2, 6, 7, 9)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

LING 105. Linguistic Analysis: Sounds and Words. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
One semester of a two-semester introduction to linguistics. Topics include: phonetics, phonology, word forms, language change, language acquisition.

LING 110. Linguistic Analysis: Sentences and Dialects. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
One semester of a two-semester introduction to linguistics. Topics include: syntax, semantics, language variation, language and society.

LING 1NT. Linguistics Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Nontraditional study in Linguistics. Prerequisite: permission of the instructor.

LING 205. Phonetics and Phonology. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An investigation into the articulatory and acoustic properties and patterns of speech sounds, with applications to speech pathology, processing, and phonological theory. Prerequisite: LING 105.

LING 206. Morphology. 1 Credit.
Offered Occasionally; Lecture hours:3
Explores the mental lexicon, the internal structure of words, and the processes by which words are formed in a wide variety of languages. Prerequisite: LING 105 or LING 110.

LING 210. Language and Race. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An introduction to "non-standard" dialects of English with a primary focus on African-American Vernacular English (AAVE). This course explores the linguistic and non-linguistic factors that give rise to language variation. Crosslisted as CBST 210.

LING 215. Syntax. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Contemporary generative theories of phrase structure and its relation to meaning. Focus on comparative syntax and its implications for Universal Grammar. Prerequisite: LING 110 or permission of the instructor.

LING 216. Semantics. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An introduction to the fundamental notions, arguments, and techniques of linguistic semantics. Focus on how meaning is structured and represented by the human mind. Prerequisite: LING 110 or permission of the instructor.

LING 220. Bilingualism. 1 Credit.
Offered Occasionally; Lecture hours:3
An examination of the psychological and social factors involved in the acquisition and use of two or more languages across the lifespan. Topics will also include language contact and bilingual education.

LING 230. Psycholinguistics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of psychological processes involved in language. Topics include language production and perception in children, adults, bilinguals, and exceptional populations.

LING 237. Introduction to Language Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of the mechanisms involved in language development. Topics include the stages in language development, theoretical approaches to language development, the biological bases of language, and atypical language development. Prerequisite: PSYC 100, or LING 105, or LING 110, or LING 230. Crosslisted as PSYC 237.

LING 295. Topics in Linguistics. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3; Repeatable
A specific linguistic topic, to be selected. Prerequisite: LING 105 or LING 110 or permission of the instructor. May be repeated for credit.

LING 2NT. Linguistics Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Nontraditional study in Linguistics.

LING 315. Advanced Syntax. 1 Credit.
Offered Occasionally; Lecture hours:3
Topics in advanced generative syntax, emphasis on new developments in syntactic theory. Prerequisite: LING 215 or LING 216.

LING 319. Undergraduate Research. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:1.5; Repeatable
Research in psycholinguistics. Research topics may be posed by students or faculty. Prerequisite: LING 230 and permission of the instructor.

LING 320. Language & Environmental Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Communication is central to how people perceive the environment, understand their relationship to it, and organize actions to change it. This course draws on concepts from linguistic anthropology, including discourse analysis, to examine debates about wildlife conservation, clean energy, eco-friendly products, environmental rights, and climate change. Crosslisted as ANTH 307 and ENST 320.

LING 325. Language and the Brain. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
An examination of the physical basis for language. Topics include the nature of language as a cognitive faculty, atypical language development in childhood, and acquired aphasia. Prerequisites: LING 105 or LING 110 or LING 230 or PSYC 237 or LING 237.

LING 330. Advanced Topics in Psycholinguistics. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Advanced study in psycholinguistics. Includes topics such as language production, language comprehension, and bilingualism. Prerequisite: LING 230 or permission of the instructor.

LING 340. Typology and Universals. 1 Credit.
Offered Occasionally; Lecture hours:3
Examination of the wide range of features in the world's languages. The course is mainly descriptive, with some theory regarding the source of linguistic universals. Prerequisite: one of the following: LING 205, LING 206, LING 215, or LING 216.

LING 390. Independent Study. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Subject to be selected by the student in consultation with the instructor. Prerequisite: permission of the instructor.

LING 395. Honors in Linguistics. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3
Honors thesis in Linguistics. Prerequisite: permission of the instructor.

Modern Hebrew Studies

Faculty

Associate Professor: Or Rogovin (Director)

Modern Hebrew is the language of the State of Israel and a key to understanding modern Jewish culture and the Middle East. Hebrew language courses at Bucknell begin with HEBR 101, which assumes no previous knowledge of the language and is conducted partially in English. As we progress toward HEBR 104, students immerse themselves in the language and develop the four language skills: reading, speaking, listening and writing. By the end of HEBR 104, students are able to communicate in solid basic Hebrew. These courses also aspire to introduce students to basic concepts and facts of Israeli culture, which are integrated into the study of the language from the very outset through music, videos, games and readings. Hebrew language courses are complemented by courses given in English on Israeli literature, history and culture. Hebrew language and Israeli culture courses satisfy some of the requirements for the Jewish studies minor. Students with Hebrew proficiency often continue to graduate school in Jewish or Near Eastern studies and often develop careers in business and government service, where knowledge of Hebrew is an asset.

Courses

HEBR 101. Beginning Modern Hebrew. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Introduction to modern Hebrew. Practice in listening, speaking, reading, and writing, elementary grammar and introduction to Israeli culture.

HEBR 102. Beginning Modern Hebrew II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Continuation of Modern Hebrew language skills. Practice in listening, speaking, reading, and writing and introduction to Israeli culture. Prerequisite: HEBR 101 or equivalent. Not open to students who completed HEBR 101A.

HEBR 103. Intermediate Hebrew I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
A continuation and review of grammar emphasizing all four skills and culture. Prerequisite: HEBR 101A or HEBR 102 or equivalent.

HEBR 104. Intermediate Hebrew II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Further review of grammar with emphasis on all four skills and culture. Prerequisite: HEBR 103 or equivalent.

HEBR 150. Topics in Jewish Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of topics in Jewish cultures or societies.

HEBR 204. Hebrew Conversation. .5 Credits.
Offered Both Fall and Spring; Lecture hours:2; Repeatable
Focused on the concentrated development of Hebrew speaking skill and knowledge of Israeli culture.

HEBR 205. Holocaust: Fact, Fiction, Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course examines the persecution and extermination of Jews and other groups by Nazi Germany (1933-1945) through three sets of lenses: historical facts, their representation in fiction (and other forms of writing) and their representation on the screen.

HEBR 236. Israel: Literature, Film, Culture. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Course explores Israeli culture in its historical, ethnic, religious, linguistic, and geographical context through literature, film, political discourse, photography, and other texts. Crosslisted as UNIV 236.

HEBR 251. The Jewish Uprooted. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
The course explores the figure of the uprooted in modern Jewish literature and culture, focusing on early 20th-century Hebrew, Yiddish, and Jewish-American writing (readings are in English). Crosslisted as UNIV 263.

HEBR 252. The Modern Jewish Experience in Lit&Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course explores modern Jewish life around the world through a variety of perspectives, including literature, film, history, and memoir. Emphasis is placed on Jews in Israel and the U.S., as well as on immigration and the Holocaust.

HEBR 292. After the Holocaust: Israel & United States. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course examines the impact of the Nazi persecution and genocide against the Jews (1933-1945) on different societies and cultures post-1945, especially in Israel and the United States. Crosslisted as UNIV 292.

HEBR 390. Independent Study. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies
Modern Hebrew at the intermediate level. Prerequisites: HEBR 102 and permission of the instructor.

Russian Studies

Faculty

Professor: James E. Lavine (Director)

Associate Professor: Ludmila S. Lavine

Assistant Professor: Lenora Murphy (Teaching)

Studying Russian, the fifth most widely spoken language in the world, becomes especially important at the present time when the Russian war in Ukraine has the potential to disrupt the world order. By developing students' language skills and expanding their knowledge of all the cultures in the region that use Russian, the Russian studies program strives to make students active participants in the multicultural, global community. Because Russian is one of the less-frequently taught languages, a major in Russian can become a unique and decisive factor in students' future careers in law, journalism, international affairs, academia, and public and government services. The faculty of the Russian studies program believes that even with a mastery of Russian grammar, real communication is still impossible unless students become familiar with the culture, society and life experiences of Russian speakers across the region. For that reason, the Russian studies program offers courses in literature, culture, film and Russian and East European society (in Russian and English).

All Russian language courses beyond RUSS 104 Intermediate Russian II include assignments that are designed to develop students' writing and speaking skills. The "content" Russian language courses at the 200 and 300 levels, and courses on Russian culture and literature taught in English, also help students enhance their critical thinking and information literacy.

Major in Russian Studies

The **major** in Russian studies consists of eight courses:

Four language courses beyond RUSS 103	4
300-level seminar in Russian	1
Three Russian literature/culture courses taught in English	3

RUSS 204 Russian Conversation is encouraged as a complement to upper-level language courses, but neither RUSS 204 Russian Conversation nor RUSS 209 Russian Complementary Reading count toward the major requirement of five language courses beyond RUSS 103 Intermediate Russian I. A 300-level Russian language seminar completed during the senior year will fulfill the College of Arts & Sciences Core Curriculum Culminating Experience requirement. This requirement also can be fulfilled by an honors thesis in Russian.

The Russian studies program offers four levels of Russian language study, striving to bring students to the intermediate high/advanced low level according to the ACTFL scale. This means that after graduation, students are able to function effectively in Russian. Students majoring in Russian are strongly urged to deepen their knowledge of the language and country by studying in an approved summer or semester program in Russia.

Russian Studies Minor

A minor in Russian Studies requires five credits in the program. At least one of the five credits, taught in either Russian or English, must have a strong literature/culture component.

1. Demonstrate the four language skills (reading, writing, speaking and comprehension) at an intermediate-high/advanced-low level. (1, 2, 6, 7, 9)
2. Demonstrate proficiency in the discussion and analysis of cultural, political, historical and literary issues within the Russian-speaking world. (2, 3, 4, 5)
3. Display an appreciation of foreign languages in general, sensitivity to cultural differences and a deeper understanding of their own culture. (1, 2, 3, 4, 5, 6, 7, 9)
4. Develop the knowledge and skills for effective functioning in either a post-graduate academic environment or a professional career. (2, 3, 4, 5, 6, 8)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

RUSS 100. Intensive Elementary Russian. 1 Credit.
Offered Spring Semester Only; Lecture hours:4,Recitation:1
Intensive elementary Russian in speaking, reading, writing and comprehending Russian. Fundamentals of first-year Russian covered in one semester.

RUSS 101. Elementary Russian I. 1 Credit.
Offered Fall Semester Only; Lecture hours:4,Recitation:1
Fundamentals of speaking, reading, writing, and comprehending Russian, and an introduction to Russian culture.

RUSS 101A. Intensive Elementary Russian. 1 Credit.
Offered Spring Semester Only; Lecture hours:4,Recitation:1
Intensive elementary Russian in speaking, reading, writing, and comprehending Russian. Fundamentals of first-year Russian covered in one semester.

RUSS 102. Elementary Russian II. 1 Credit.
Offered Spring Semester Only; Lecture hours:4,Recitation:1
Fundamentals of speaking, reading, writing, and comprehending Russian, and an introduction to Russian culture. Prerequisite: RUSS 101 or equivalent is prerequisite for RUSS 102.

RUSS 103. Intermediate Russian I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:2
Continued focus on all language skills combined with the study of cultural texts. Prerequisite: RUSS 101A or RUSS 102 or equivalent for RUSS 103; RUSS 103 is the prerequisite for RUSS 104.

RUSS 104. Intermediate Russian II. 1 Credit.
Offered Both Fall and Spring; Lecture hours:4,Recitation:1
Advanced points of grammar and review of grammar. Training in all language skills combined with the study of cultural texts. Prerequisite: RUSS 102 or equivalent for RUSS 103; RUSS 103 is the prerequisite for RUSS 104.

RUSS 125. Topics in Russian Culture. 1 Credit.
Offered Fall Semester Only; Lecture hours:3; Repeatable
An examination of everyday life in Russia, as a mirror of historical, ideological, sociological, and economic forces. In English.

RUSS 204. Russian Conversation. .5 Credits.
Offered Both Fall and Spring; Lecture hours:2; Repeatable
Concentrated development of speaking skill. Conducted entirely in Russian by a native speaker. Intended for students enrolled in 200- and 300-level courses.

RUSS 209. Russian Complementary Reading. .5 Credits.
Offered Either Fall or Spring; Lecture hours:1
Russian sources read in conjunction with English language courses. Independent course of study established by instructor and student. Prerequisite: the equivalent of four semesters of Russian. This course cannot be taken more than twice.

RUSS 226. Russian Through Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An advanced study of Russian through film and television programs. In Russian. Prerequisite: RUSS 104 or permission of the instructor.

RUSS 230. Russian Song: Poetry, Politics, Pop. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
The role of song in Russian culture. Genres studied include art song, guitar poetry, contemporary pop and folk rock. In Russian.

RUSS 235. Russian Amerika. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The confrontation of Russian and American cultures through the lens of literary giants. We explore the effects of displacement and exile, dual cultural identity, and the immigrant experience. Nabokov, Solzhenitsyn, Brodsky, and Shteyngart are among the authors considered. In English.

RUSS 240. From Russia to the Stars: Russian Sci-Fi through the Ages. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
From utopian dreams of the 1800s to contemporary sci-fi, this course introduces students to over 100 years of Russian art dreaming of a world beyond the present. In English.

RUSS 250. Crimes and Punishments: 19th-century Russian Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of major works of 19th-century Russian literature by Pushkin, Gogol, Dostoevsky, Tolstoy and Chekhov and their influence on Western European literary canon. In English.

RUSS 252. Russian Through Literature. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
A study of Russian through literary works by contemporary Russian writers. In Russian.

RUSS 254. Russian Through History. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Advanced study of Russian through history and its treatments in literature, film, music, and media. In Russian. Prerequisite: RUSS 104.

RUSS 255. Dangerous Texts: 20th-century Russian Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Discussion of major trends and key literary figures in Russian literature from the 1917 Revolution to post-Soviet Russia. Focuses on texts that challenge established orthodoxies. In English.

RUSS 280. Topics in the Slavic Languages. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Study of a Slavic language other than Russian. Languages may include Ukrainian, Polish, Czech, and Serbo-Croatian. Prerequisite: permission of the instructor.

RUSS 295. Topics in Russian Studies. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3; Repeatable
Readings and discussion of special interest relevant to Russian studies. Topics selected by students in consultation with the instructor. In Russian.

RUSS 305. Russian Media. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An advanced study of the Russian language through close reading and discussion of Russian media.

RUSS 311. Readings in Russian Literature. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3; Repeatable
An advanced study of the Russian language through close reading and discussion of short works by major Russian writers. In Russian. Not open to students who have taken RUSS 252.

RUSS 312. Readings in Russian Poetry. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An advanced study of Russian through close reading and discussion of Russian poetry. In Russian. Prerequisite: RUSS 201 or RUSS 252. Not open to students who have taken RUSS 230.

RUSS 314. Russian History and Politics: Russian History and its Reincarnations in Contemporary Politics. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Advanced study of Russian through history and its reincarnations in contemporary politics and culture. In Russian. Not open to students who have taken RUSS 254. Prerequisites: RUSS 201 or RUSS 226 or RUSS 230 or RUSS 252.

RUSS 330. Nabokov and His Worlds. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Major works of one of the greatest authors of the 20th century. Nabokov's Russian and American periods examined in the context of both literary traditions. In English. Crosslisted as ENLS 330, ENLS 630 and RUSS 630.

RUSS 357. Petroleum Putinism & Plutonium. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the role of nationalism, alongside ideas about energy and nature, in the Russian state's current historical colonial relationships with neighboring countries, Central Asia and Indigenous communities of Siberia. Topics include Russian imperial/Soviet state extractivist economics, Russian/regional pipeline and petro politics, social resistance and climate change futures. Crosslisted as ENST 357 and POLS 357.

RUSS 390. Independent Study. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Advanced independent research under the supervision of an instructor. Subject to be selected by student in consultation with the instructor. Prerequisite: permission of the instructor.

RUSS 393. Honors in Russian. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Independent study for RUSS 393 Honors in Russian. Prerequisite: permission of the instructor.

Latin

Faculty

Professors: Kevin F. Daly, Stephanie Larson

Associate Professors: Ashli Baker, Kristine Trego (Chair)

Assistant Professor: Katie Tardio

See Classics & Ancient Mediterranean Studies (p. 67).

Latin American, Latinx & Caribbean Studies Program

Faculty

Associate Professor: David M. Rojas (Director)

Assistant Professor: Aisha Cort

Affiliated Faculty: Emma L. Banks (International Relations), Paul Barba (History), Fernando Blanco (Spanish), Adam Burgos (Philosophy), Raphael Dalleo (English), Elizabeth Durden (Sociology), Elisabeth Guerrero (Spanish), R. Douglas Hecock (Political Science), Manuel Larrabure (International Relations), Stephan Lefebvre (Economics), Daniel Bret Leraul (Comparative & Digital Humanities), Eddy A. López (Art & Art History), Elena Machado Sáez (English), Jason Aaron McCloskey (Spanish), Jasmine A. Mena (Psychology), Cassie Osei (History), Ana M. Patiño (Spanish), Apollonya Maria Porcelli (Sociology & Anthropology), Nathan C. Ryan (Mathematics), Clare Sammells (Anthropology), Hiram L. Smith (Spanish), Matías Vernengo (Economics), Peter R. Wilshusen (Environmental Studies & Sciences)

Adjunct: Elena Perez-Zetune

Latin American, Latinx & Caribbean Studies Program

Explore how diverse, vibrant communities shape worlds of encounters and collaborations. Established in 1975 as one of the first degree programs in the U.S. to focus on Latin America, our program now embraces the broader cultural, historical and social ties that connect communities in Latin America, Caribbean and Latinx diasporas.

As a student in the Latin American, Latinx & Caribbean studies program at Bucknell, you'll chart your own course of discovery and research under the guidance of faculty from the social sciences, humanities and arts departments.

Gaining such interdisciplinary knowledge will help you develop skills and insights that are sought in a wide range of careers, professional schools and graduate studies. You can also engage with these critical questions alongside another discipline through a double major or minor.

As a student in the Latin American, Latinx & Caribbean studies program, you are strongly encouraged to travel or study abroad in the region. You will also have the opportunity to conduct independent research projects with our faculty members.

Mission Statement

Drawing on disciplines from the humanities, social sciences and the arts, the Latin American, Latinx & Caribbean studies program takes an interdisciplinary approach to examining the complex experiences of peoples across these regions and their diasporas.

Students in the program engage with faculty who specialize in areas such as migration, colonialism, racism, economic justice, LGBTQ+ movements, climate crises, and the ongoing struggle for democracy and human rights throughout the Americas. Our courses emphasize the transnational and intersectional dimensions of these issues, critically analyzing how the histories and futures of Latin America, the Caribbean and Latinx populations in the U.S. are intertwined.

By fostering a deeper understanding of these interconnected cultures and communities, the program equips students with the skills to navigate global issues, inter-American relations, and shifting realities within the U.S. It also provides opportunities for linguistic and cultural proficiency in a regional language— including but not limited to French, Kreyòl, Portuguese, Quechua, Spanish — preparing graduates for careers in public, private, and nonprofit sectors that seek informed and culturally aware global citizens.

Latin American, Latinx & Caribbean Studies Program Learning objectives

1. Apply a social science perspective to understand historical and contemporary theories, issues and processes that inform the study of Latin America, the Caribbean and Latinx communities.
2. Apply a humanistic perspective to understand historical and contemporary theories, issues and processes that inform the study of Latin America, the Caribbean and Latinx communities.
3. Demonstrate proficiency in understanding, speaking and writing a regional language —including but not limited to French, Kreyòl, Portuguese, Quechua, Spanish.
4. Communicate integrated disciplinary perspectives through written and oral argument on complex issues and processes related to Latin America, the Caribbean and Latinx communities.
5. Design and conduct independent, original research that contributes to the understanding of historical and contemporary concepts, issues or processes focused on Latin America, the Caribbean and Latinx populations.

Major/Minor

These various topics and objectives, combined with expanded understanding of international issues, increased appreciation for inter-American and global relations, and extensive study of a non-English language spoken in Latin America or the Caribbean, bring depth and sophistication to the majors and minors in the Latin American, Latinx and Caribbean studies program.

- Both a major and a minor are offered by the Latin American, Latinx and Caribbean studies program.
- Majors and minors are expected to become proficient in a non-English language spoken in Latin American, Latinx & Caribbean studies program.

Study Abroad in Latin American and the Caribbean

Students in the Latin American, Latinx & Caribbean studies program are strongly encouraged to plan a semester, a year or a summer of study in Latin America and/or the Caribbean. Latin American studies minors are encouraged to spend a semester or a summer of study in Latin America and/or the Caribbean. When students elect the Latin American studies major, they should consult with their adviser, with the director of the Latin American, Latinx & Caribbean studies program, and with the Office of Global & Off-campus Education (OGOE) regarding suitable foreign study opportunities. Exceptions to the Bucknell-approved study abroad programs must be approved by the director of the Latin American, Latinx & Caribbean studies program and the Office of Global & Off-campus Education (OGOE).

Service-learning Experience

Majors and minors *are encouraged* to participate in one or more service-learning experiences in Latin America or with Latin American roots in the United States.

Student-faculty Research

Majors and minors are encouraged to approach individual faculty members in the Latin American, Latinx & Caribbean studies program to seek opportunities to participate in faculty-initiated research in Latin America or involving Latin Americans roots in the United States.

Honors Thesis in Latin American, Latinx & Caribbean Studies Program

The Latin American, Latinx & Caribbean studies program strongly encourages qualified majors to consider working for interdisciplinary honors. During their junior year, such students should consult with one or more members of the Latin American, Latinx & Caribbean studies program faculty to begin defining a research topic and writing a proposal to be submitted to the Honors Council by mid-October of the senior year. Normally, a student for honors in Latin American, Latinx & Caribbean studies will enroll for:

Further information about the honors program can be obtained from the academic adviser, from the director of Latin American, Latinx & Caribbean studies program or from the Honors Council.

Major Requirements

A minimum of **eight** courses selected according to the core requirements listed below, including a Latin American studies Culminating Experience and exhibited proficiency in a non-English language spoken in Latin America or the Caribbean, as described below.

List A

Two Latin American studies courses selected from the following list:

LAMS 150	Latin America: An Introduction	1
LAMS 202	Rainforests and Eco-Politics in Latin America	1
LAMS 260	Blackness & Diaspora in the Global South: Afrolatinidades in Diaspora	1
LAMS 319	Interdisciplinary Independent Study on Latin America	1

List B

At least one of the courses to complete the major must address the experiences of Latinx populations in the US.

LAMS 160	Ni de aquí, ni de allá: Latinx Peoples in US	1
LAMS 203	Identity, Politics, Nation	1
LAMS 204	Racism(s) Across the Americas	1
LAMS 270	Race-ing Latinidad in US: Dialogues of Blackness & Latinidad	1
LAMS 272	Latina Girlhood: Coming of Age	1

List C

Two social science courses on Latin American topics from different departments or programs selected from the following list:

ECON 273	Latin American Economic Development	1
ECON 319	Economic History of Women in the United States [1]	1
ENST 325	Nature, Wealth and Power	1
IREL 201	Modernization and Social Revolution in Latin America	1
IREL 227	Latin American Politics and Development	1
IREL 252	Political Economy of Global Resources	1
IREL 275	Global Governance	1
POLS 211	Politics of the Developing World	1
POLS 219	Latin American Politics	1
POLS 352	Politics of Economic Development	1
PSYC 374	Latinx Psychology	1

List D

Two humanities courses on Latin American topics from different departments or programs selected from the following list:

CBST/LAMS 206	Black Film in Latin America	1
CBST 222	Caribbean Literature	1
ENLS 213	Special Topics in American Literature ("Beyond Rum and Revolution")	1
ENLS 214	US Latino/a Literature	1
ENLS 217	Studies in Dramatic Literature ("Margins to Mainstream: US Latino/a Theater and Film")	1
HIST 258	Topics in Women's and Gender History [2]	1
HIST 282	Modern Latin America	1
HIST 311	U.S. History since 1865 [1]	1
PHIL 264	Latin American, Latinx and Caribbean Philosophy	1
SPAN 222	Introduction to Latin American Literature	1
SPAN 264	Hispanic Topics [1]	1
SPAN 280	Latin American Cultural Traditions	1
SPAN 285	Latinx Literature in the U.S.	1
SPAN 295	Topics in Spanish [1]	1

SPAN 323	Latin American Short Story	1
SPAN 361	Topics in Hispanic Literature [1]	1
SPAN 362	Topics in Latin American Literature [1]	1
SPAN 364	Topics in Spanish Civilization (Black Africans in the Hispanic Black Atlantic) [1]	1
SPAN 365	Topics in Latin American Civilization	1

List E

One elective course selected from courses in Lists A, B, C or D, or listed below:

LAMS 218	Latina Feminisms in US	1

[1] These courses will count toward a Latin American studies major or minor when the content places significant emphasis on a Latin American topic.

[2] This class has reserved seats for Latin American studies major and minors.

Additional Courses

Additional courses with substantial Latin American content that do not appear in one of the lists above may be elected from the approved courses offered each semester under Latin American studies (LAMS) in the current *Class Schedule*.

Language Proficiency & Competency

Latin American studies majors are required to demonstrate proficiency in any of the non-English languages spoken in Latin America and the Caribbean. Students fulfill this requirement by successfully completing at least one course taught in the Spanish or French language at the 207 level or above at Bucknell, or through a language assessment of any relevant language conducted by a faculty member. The requirement also could be satisfied by a semester abroad, preapproved by the department/program head.

Prerequisites Courses

Of the courses in Lists A, B, C and D, the following courses have prerequisites or require permission from the instructor:

ECON 319	Economic History of Women in the United States	
Prerequisites: ECON 256 or ECON 203 or ECON 204		1
IREL 250	Theories of International Relations	
Prerequisite: POLS 170		1
IREL 252	Political Economy of Global Resources	
Prerequisite: ECON 103		1
IREL 350	Globalization	
IREL majors; ECON 127 and IREL 250 preferred		

Culminating Experience

During the senior year (or second semester of the junior year with the approval of the student's Latin American studies adviser), majors in Latin American studies are required to complete one Culminating Experience course. Courses fulfilling this requirement include 300-level or higher courses with a LAMS designation or 300-level or higher courses on a Latin American topic taught by any faculty member affiliated with Latin American, Latinx & Caribbean studies. Within the Culminating Experience course, LAMS majors will undertake a paper or a project that focuses on a Latin American topic and provides evidence of:

1. Application of interdisciplinary perspectives from the social sciences and humanities,
2. Grounding in specific theories and approaches in the field of Latin American studies, and
3. Knowledge of primary informational and database resources in the study of Latin America, thereby ensuring that majors complete coherent integrative work in the discipline of Latin American studies. With the permission of the Latin American studies adviser, a student who is taking an independent study or pursuing honors in Latin American studies, and who is enrolled in LAMS 319 Interdisciplinary Independent Study on Latin America, may satisfy the Culminating Experience requirement through the successful completion of an independent study project or an honors thesis.

Minor in Latin American Studies

Core Requirements

Students complete the interdisciplinary **minor** in Latin American studies when they successfully complete a minimum of five courses selected according to the following criteria and have demonstrated competency in a non-English language spoken in Latin America or the Caribbean.

List A

One Latin American studies course selected from the following list:

LAMS 150	Latin America: An Introduction	1
LAMS 202	Rainforests and Eco-Politics in Latin America	1
LAMS 260	Blackness & Diaspora in the Global South: Afrolatinidades in Diaspora	1
LAMS 319	Interdisciplinary Independent Study on Latin America	1

List B

At least one of the courses to complete the minor must address the experiences of Latinx populations in the U.S.

LAMS 160	Ni de aquí, ni de allá: Latinx Peoples in US	1
LAMS 203	Identity, Politics, Nation	1
LAMS 204	Racism(s) Across the Americas	1
LAMS 270	Race-ing Latinidad in US: Dialogues of Blackness & Latinidad	1
LAMS 272	Latina Girlhood: Coming of Age	1

List C

One social science course on Latin American topics selected from the following list:

ECON 273	Latin American Economic Development	1
ECON 319	Economic History of Women in the United States [1]	1
ENST 325	Nature, Wealth and Power	1
IREL 201	Modernization and Social Revolution in Latin America	1
IREL 227	Latin American Politics and Development	1
IREL 252	Political Economy of Global Resources	1
IREL 275	Global Governance	1
POLS 211	Politics of the Developing World	1
POLS 219	Latin American Politics	1
POLS 352	Politics of Economic Development	1
PSYC 374	Latinx Psychology	1

List D

One humanities course on Latin American topics selected from the following list:

CBST/LAMS 206	Black Film in Latin America	1
CBST 222	Caribbean Literature	1
ENLS 213	Special Topics in American Literature ("Beyond Rum and Revolution")	1
ENLS 214	US Latino/a Literature	1
ENLS 217	Studies in Dramatic Literature	1
HIST 258	Topics in Women's and Gender History [2]	1
HIST 282	Modern Latin America	1
HIST 311	U.S. History since 1865	1
PHIL 264	Latin American, Latinx and Caribbean Philosophy	1
SPAN 222	Introduction to Latin American Literature	1
SPAN 264	Hispanic Topics [1]	1
SPAN 280	Latin American Cultural Traditions	1
SPAN 285	Latinx Literature in the U.S.	1
SPAN 295	Topics in Spanish [1]	1
SPAN 323	Latin American Short Story	1
SPAN 361	Topics in Hispanic Literature [1]	1
SPAN 362	Topics in Latin American Literature [1]	1
SPAN 364	Topics in Spanish Civilization (Black Africans in the Hispanic Black Atlantic)	1
SPAN 365	Topics in Latin American Civilization	1

List E

One elective selected from among any courses in Lists A, B, C or D, or the following additional courses on Latin American topics:

LAMS 218	Latina Feminisms in US	1

[1] These courses will count toward a Latin American studies minor when the content places significant emphasis on a Latin American topic.
[2] This class has reserved seats for Latin American studies majors and minors.

Additional Courses

Additional courses with substantial Latin American content that do not appear in one of the lists above may be elected from the approved courses offered each semester by the Latin American, Latinx & Caribbean studies program.

Language Proficiency & Competency

Competency in the fundamental skills of a non-English language spoken in Latin America or the Caribbean is expected of Latin American studies minors.

Prerequisites Courses

Of the courses in Lists A, B, C and D, the following courses have prerequisites and require permission from the instructor.

ECON 319	Economic History of Women in the United States
Prerequisites: ECON 203 or ECON 204	
IREL 250	Theories of International Relations
Prerequisite: POLS 170	
IREL 252	Political Economy of Global Resources
Prerequisite: ECON 101	
IREL 350	Globalization
Prerequisite: IREL majors; ECON 227 and IREL 250 preferred	

Courses

LAMS 150. Latin America: An Introduction. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course examines the variety of modes of living that thrive in what we call Latin America. Understanding such diversity makes it possible to consider how much is life in the United States connected to the past and present of Latin American peoples.

LAMS 160. Ni de aquí, ni de allá: Latinx Peoples in US. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course is an interdisciplinary study of the Latinx population in the United States. We will approach the subject through literature, film, music, academic articles and direct contact with Latinx peoples.

LAMS 202. Rainforests and Eco-Politics in Latin America. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
We study how business interests, scientists, and indigenous peoples think and engage with rainforests in radically different ways. Attentive to these differences, the course explores how rainforests are being destroyed by some groups and protected by others. Crosslisted as ANTH 202 and ENST 209.

LAMS 203. Identity, Politics, Nation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
We examine how the notion of race plays a role in political debates that revolve around the issue of "national identity" in the US. We focus on how Black and Brown intellectuals and activists who challenge the notion that, at its core, the US is a white nation.

LAMS 204. Racism(s) Across the Americas. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
We explore how the idea of the Americas as a “new world” of discovery and wonder was (and is) entangled with racialized systems of domination. Looking into anti-racist ideas and actions today, the course critically explores the shared histories and common futures of diverse peoples across the Americas. Crosslisted as CBST 204.

LAMS 205. Violence, Conflict and Peace in Latin America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores the historical and contemporary causes of political, structural, and systematic forms of violence in Latin America. Crosslisted as ANTH 205 and IREL 205.

LAMS 206. Black film in Latin America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course, we will investigate the historical and intellectual grounds of films by and about Black people in Latin America. Crosslisted as CBST 206.

LAMS 208. Global Indigenous Politics and Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores Indigenous people's historical and contemporary struggles for recognition and respect with an emphasis on Indigenous groups in Latin America and global governance. Crosslisted as ANTH 208 and IREL 208.

LAMS 209. Cuba and the Global South. 1 Credit.
Offered Summer Session Only; Lecture hours:3
This course interrogates Cuba's positioning in the Global South as an inspiration for revolutionary movements of the mid-20th century. This interdisciplinary survey of history and narrative modes of film, literature, music, and popular culture discusses the formation and operation of "Cubanía", external foreign policy, and internal repression and censure under the constraints of the tenets of the Cuban Revolution.

LAMS 218. Latina Feminisms in US. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines the various experiences, perspectives and expressions of Latinas in the United States, which vary according to gender, sexuality, race, citizenship, region and language. Crosslisted as GEOG 208 and WMST 218.

LAMS 227. Caribbean Literature. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3
Introduction to selected literatures, cultures and histories of the Caribbean, with close analysis of text and context. When taught in the summer, the course is the core of the Bucknell in the Caribbean summer study abroad program. Crosslisted as CBST 222 and ENLS 227.

LAMS 230. Arts of Extraction: Hemispheric Representations of Ecological Injustice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explore the social and environmental histories of capitalism in Latin America and the US through literary, filmic and photographic representations of resource extraction. Environmental collapse is imminent, but many can't see it. Can the arts help us see our world differently so that we might forestall its worst effects? Crosslisted as HUMN 230.

LAMS 260. Blackness & Diaspora in the Global South: Afrolatinidades in Diaspora. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Afro-Latinx identity challenges the notion that Blackness and Whiteness are THE two political categories of race. In this course we will interrogate Afro-Latinidad via an interdisciplinary survey of history and narrative modes of film, literature, music and popular culture. Crosslisted as CBST 260.

LAMS 264. Latin American, Latinx and Caribbean Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will focus on major figures and issues within philosophy in Latin America, the Caribbean and the Latinx U.S., with an emphasis on the connection between identity-formation and politics. Crosslisted as PHIL 264.

LAMS 270. Race-ing Latinidad in US: Dialogues of Blackness & Latinidad. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An interdisciplinary study of the competing definitions of the relationship between Blackness and Latinidad in US culture. We will approach the subject through literature, film and music, through academic articles from various disciplines and through direct contact with the local Latinx population. Crosslisted as CBST 270.

LAMS 272. Latina Girlhood: Coming of Age. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Latina girls make up more than one in five girls aged 5–17 and increasing. Despite this increasing demographic, the level of inclusion of Latina girls in academic scholarship and traditional media remains low. This course focuses on representations of Latina in the U.S. through the lens of girlhood/coming of age. Crosslisted as WMST 272.

LAMS 273. Latin American Economic Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course deals with historic and contemporary economic problems, starting from colonial times and reaching the present integration into world economy. Crosslisted as ECON 273 and IREL 278.

LAMS 295. Modern Latin America. 1 Credit.
Lecture hours:3
This course traces and analyzes major developments in Latin American politics, society and culture from 1800 to the present. Crosslisted as HIST 282.

LAMS 296. Topics in Latin American Studies. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Topics in Latin American history: pre-Columbian to the present.

LAMS 311. Globalization, Technology and Cultural Change. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examination of the impact of the processes of global restructuring and the technological revolution on people, culture and society. This class will focus on Latin America and the Caribbean. Crosslisted as SOCI 311.

LAMS 319. Interdisciplinary Independent Study on Latin America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Individual research with a member of the Latin American Studies faculty. Prerequisite: permission of the instructor.

LAMS 374. Latinx Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A seminar that examines the psychological research literature related to Latinxs in the U.S. It considers the influences of Latinx cultural values, practices, contexts and experiences on physical and mental health outcomes. Open to juniors seniors only or by permission of the instructor. Crosslisted as PSYC 374 and PSYC 674.

Legal Studies Minor

Faculty

Coordinator: Jeffrey S. Turner

The legal studies minor requires at least five courses, one course from each of the five categories listed below. No more than three of these courses may be in a single department. Courses applied to the legal studies minor may not also be applied to a student's major. One course credit earned off campus may be used to meet a requirement for this minor.

1. Case Law

ACFM 201	Business Law	1
ENST 295	Topics in Environmental Studies (Only sections titled "Environmental Law")	1
IREL 255/POLS 278	International Law	1
POLS 242	Constitutional Law: Civil Liberties	1
RELI 262	Islamic Law	1
RELI 279	Judaism and Law	1
RELI 280/POLS 247	Religion and Constitutional Law	1

2. Law & Social Science

CBST 280	Race, Violence & Incarceration	1
ECON 330	Law and Economics	1
POLS 240	The American Congress	1
POLS 244	American Judicial Politics	1
POLS 375	Analyzing Legislatures	1
SOCI 229	Law and Society	1
SOCI 234	Criminology	1
SOCI 251	Violence and Society	1
SOCI 341	Seminar in Law and Society	1
WMST/ANTH 332	Women & the Penal System	1

3. Legal Theory

CBST 271	Politics of Anti-Blackness	1
ENLS 101	Ways of Reading (Only sections titled "Law and Literature")	1
PHIL 100	Introduction to Philosophy (Only sections titled "Faith, Reason and Morality" or "Law, Morality, and Society")	1
PHIL 246	Philosophy of Law	1
POLS 260	Topics in Legal Thought	1
POLS 263	Race & Ethnicity in American Legal Thought	1

4. Ethics

ENST 255	Environmental Injustice and Activism	1
PHIL 213	Ethics	1

PHIL 214	Social and Political Philosophy	1
PHIL 228	Contemporary Ethical Theory	1
PHIL 274	Bioethics	1
POLS 210	Political Theory	1
POLS 256	Topics in Social and Political Ethics	1
POLS 257	Ethics and Public Policy	1
POLS 364	Justice and Public Policy	1
RELI 100	Introduction to Religion (Only sections titled "Introduction to Ethics")	1
RELI 226/ENST 236	Environmental Ethics	1

5. Philosophical Foundations of Law

PHIL 246	Philosophy of Law	1

Highly motivated students may also satisfy this requirement with an appropriate independent study with any member of the faculty who teaches courses in categories 1 to 4. The student must submit a written proposal with the sponsoring faculty member's endorsement to the legal studies coordinator. Registration for an independent study in legal studies uses the following course abbreviation.

IDPT 320 Interdepartmental Independent Studies

Liberal Studies

Whereas most majors are based upon a field of study and primarily emphasize mastery of a subject area, the liberal studies major does not require competence in only one academic discipline but focuses instead on the overall intellectual development of the individual student. In so doing, it offers maximum freedom in meeting educational interests, but at the same time imposes unusual responsibility for designing a coherent program. In cooperation with their advisers, the student prepares an acceptable course of study. The student must also complete a senior project which will integrate the diverse material they have studied and serve as the culminating experience for the major. This project is planned no later than the final months of the junior year.

To register as a liberal studies major, students must complete the formal proposal for the major, including a detailed statement of educational goals, delineation of a series of courses for the ensuing semester and a rationale for their program. This statement must be endorsed in writing by three faculty members, one of whom will serve as the student's adviser. This completed application is due no later than the fifth semester of study, or the end of the first semester of the junior year. A student desiring to elect a liberal studies major after the end of the first semester of the junior year must seek approval by the associate dean of their college.

At registration for each succeeding semester, another proposal specifying courses for that term must be submitted to the adviser and the associate dean. Additional information about the liberal studies major and a copy of the formal application describing the process in detail can be obtained from the Office of the Dean of the College of Arts & Sciences.

Mathematical Economics

Faculty

Director: kb Boomer (Mathematics)

Coordinating Committee: Erdogan Bakir (Economics), kb Boomer (Mathematics), Christina Hamlet (Mathematics), Thomas C. Kinnaman (Economics), Carl Shu-Ming Lin (Economics)

Mathematics has traditionally served as the language of the natural sciences, and more recently it has become a useful tool in the social sciences, particularly in economics.

The Bachelor of Science in Mathematical Economics at Bucknell University was developed jointly by the Department of Mathematics and the Department of Economics. It is a coordinated curriculum that incorporates economics, mathematics and statistics to provide the strong foundations that offer students both the intellectual and the quantitative skills to grapple with questions at the interface of these two disciplines.

Students interested in economics and mathematics could also consider a double major in economics and mathematics within the B.A. degree program, or combine a B.A. in one of these disciplines with an academic minor in the other. Students who plan to attend graduate school in economics might consider the mathematical economics major focusing on the theoretical track and add MATH 304 Statistical Inference Theory. Students undecided among these options are encouraged to contact a member of the coordinating committee.

Mathematical Economics Major

The B.S. **major** in mathematical economics requires a total of 18 credits: seven from economics, 10 from mathematics and one culminating experience.

The College of Arts & Sciences Core Curriculum (CASCC) culminating experience requirement and one W2 requirement will be satisfied with ECON 441 Econometric Research for the Statistical and Theoretical track, and with MATH 342 Topics in Finance or Industry for the Computational track.

Required Economics Courses

ECON 101	Economic Principles/Problems	1
ECON 202	Intermediate Microeconomics [1]	1
ECON 203	Intermediate Macroeconomics [1]	1
ECON 204	Intermediate Political Economy	1
ECON 241	Econometrics	1
Two economics courses [2]		2
Total Credits		**7**

[1] ECON 202 Intermediate Microeconomics and ECON 203 Intermediate Macroeconomics address the information literacy goals of the CASCC.
[2] Selected in consultation with the student's academic adviser. One must be at the 300 level.

Students preparing for graduate studies in economics are strongly encouraged to complete a one-credit senior thesis in economics.

Required Mathematics Courses

MATH 201	Calculus I	1
MATH 202	Calculus II	1
MATH 211	Calculus III	1
MATH 216	Statistics I [3]	1
MATH 217	Statistics II	1
MATH 245	Linear Algebra	1
MATH 303	Probability	1
Select one of the following tracks: [4]		3
Theoretical track		
MATH 280	Logic, Sets, and Proofs	
MATH 308	Real Analysis I	
MATH 345	Advanced Linear Algebra	
Computational track		
CSCI 203	Introduction to Computer Science	
MATH 343	Numerical Analysis	
MATH 358	Topics in Operations Research	
Statistical track		
MATH 304	Statistical Inference Theory	
MATH 358	Topics in Operations Research	
MATH 405	Statistical Modeling	
Total Credits		**10**

[3] MATH 216 Statistics I addresses the writing goal and the formal presentation goal of the CASCC.
[4] The track is selected in consultation with the academic adviser.

The recommended sequence of courses for students is as follows:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ECON 101	1	ECON 202	1
MATH 201	1	MATH 202	1

		MATH 216	1
	2		**3**

Sophomore

First Semester	**Credits**	**Second Semester**	**Credits**
ECON 203	1	ECON 204	1
MATH 211	1	MATH 245	1
MATH 217	1	MATH 303	1
	3		**3**

Junior

First Semester	**Credits**	**Second Semester**	**Credits**
ECON 241	1	Economics elective	1
Mathematics track course 1	1	Mathematics track course 2	1
	2		**2**

Senior

First Semester	**Credits**	**Second Semester**	**Credits**
Second economics elective[5]	1	Culminating Experience[6]	1
Mathematics track course 3[5]	1	ECON 441 (Statistical or Theoretical track)	
		MATH 342 (Computational track)	
	2		**1**

Total Credits: 18

5 Either first semester or second semester.

6 ECON 441 and MATH 342 are offered during alternating spring semesters. The culminating experience course will be taken during the spring semester of junior or senior year, depending upon track.

Please see the Economics section and the Mathematics section of this catalog for a list of courses with course descriptions.

The goal of bachelor of science majors in mathematical economics is to combine the quantitative methods and the theoretical foundations of mathematics with the study of economics to address economic problems. The program learning goals are:

1. Demonstrate an understanding of the mathematical tools used in basic and advanced economic modeling.
2. Apply quantitative models and theoretical foundations of mathematics to the study of economic problems.
3. Apply regression and/or applied mathematical models to assess econometric theoretical hypotheses in varied and complex applications.

Economics Courses

ECON 101. Economic Principles/Problems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
General introduction to both macroeconomics and microeconomics, along with an introduction to economic history, international economics, and political economy. The course also examines the origin of economic ideas in the works of Adam Smith, John Maynard Keynes, Karl Marx, and others.

ECON 104. The Evolution of Economic Ideas and Systems. .25 Credits.
Offered Fall, Spring, Summer; Lecture hours:1
This course covers how economic ideas evolved alongside changes in economic systems. Topics include the economic thought of Smith, Marx, Veblen, Keynes and Hayek, and economic systems such as ancient communism, empires, feudalism, mercantilism and various forms of capitalism. Students read and write independently on the topic.

ECON 127. International Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of international economic relations today and of the theory used to analyze trade and financial relations. Attention is given to the problems of government policy with respect to international issues.

ECON 198. Independent Study. .25-1 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:3; Repeatable
Independent Study - Individual product or project supervised by a member of the economics department.

ECON 202. Intermediate Microeconomics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Intermediate Microeconomic theory of the consumer, the firm, market structures, and resource allocation. Topics are introduced using differential calculus. Prerequisites: ECON 101 and (MATH 192 or MATH 201).

ECON 203. Intermediate Macroeconomics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The study of national income, employment, inflation, interest rates, and the impact of monetary and fiscal policy on the economy. Prerequisite: ECON 101 and (MATH 192 or MATH 201).

ECON 204. Intermediate Political Economy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Intermediate study of Marxist and institutionalist political economy. The ideas of Marx and Veblen applied to such matters as the distribution of income and power, the environment, working conditions, consumerism, and race and gender issues. Prerequisite: ECON 101.

ECON 209. Economic Geography. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Inquiry into local and global changes in economic activity, location and spatial organization, especially focusing on implications for the well-being of people in particular places. Crosslisted as GEOG 209.

ECON 210. Introduction to Behavioral Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to the field of economics focused on incorporating psychological insights into models of decision making and group interaction. This course provides students with an overview of an assortment of research topics and methods within the field of behavioral economics. Seniors require permission of the instructor.

ECON 215. Economics of Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course integrates the study of economics with education by employing economic principles, frameworks and analytical tools, to analyze and assess the various factors influencing educational decision-making, policies, resource allocation and outcomes. At its core, this course explores the fundamental question: What role does education play within the economy?.

ECON 217. Geographies of Uneven Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course, we will build a critical understanding of the nature and processes of development in the global south countries while exploring the role of colonialism, imperialism and capitalism. Includes topics such as global political-economic change, population growth, human capital, microfinance, food politics and gender inequality. Crosslisted as GEOG 227.

ECON 220. Political Economy of Neoliberalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course interrogates our current economic period: Neoliberalism. We analyze power differentials and economic disparities created by neoliberalism. Specific attention is paid to the shifting role of government in the economy, mass incarceration, and the 2008 financial crisis. Prerequisite: ECON 101. First- and second-year students only; others by permission.

ECON 222. Economic Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected issues in economic theory or policy. Prerequisite: ECON 101.

ECON 224. African Women & Social Action. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of topics in films and novels by Ousmane Sembene: pre-colonial history, colonialism, post-colonial independence, racial and gender oppression, worker exploitation, religious conflict, and modernization. Prerequisites: ECON 101 or permission of the instructor. Crosslisted as WMST 224.

ECON 226. Political Economy of the European Integration. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to core issues and theories related to the economic and political processes of European integration. Offered through Bucknell in London. Crosslisted as POLS 221.

ECON 231. Economics of Climate Change. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course reviews climate science and the sources and expected impacts of climate change. Domestic and international climate policy instruments are evaluated with special attention given to the effects of climate policy on economic development and equity. Prerequisite: ECON 101.

ECON 235. African Economic Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A historical, institutional analysis of Sub-Saharan African economic, social, and political development. Primary emphasis will be on the analysis of the economic crisis facing the subcontinent since the late '70s and the structural adjustment programs that have been instituted to deal with the crisis. Prerequisite: ECON 101.

ECON 237. Health Politics and Health Policy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
History of health care delivery and financing in the United States and introduction to and evaluation of current topics in health policy. Prerequisite: ECON 101 or permission of the instructor. First- or second-year standing, others by permission.

ECON 241. Econometrics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The application of statistical methods to quantify and test economic theories, analyze government policies, and forecast economic variables. Prerequisites: ECON 101 and (MATH 216 or MATH 227 or PSYC 215) and (MATH 192 or MATH 201).

ECON 243. Global Communities. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the complexities of globalization, analyzing its benefits, challenges and diverse impacts. The course hones critical thinking, reading, writing and communication skills while addressing global political, economic, cultural and environmental issues. Students will engage with multiple perspectives to become informed participants in global discussions and problem-solving. Crosslisted as SOCI 343.

ECON 246. American Capitalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the origins and development of capitalism in the United States. Property rights, how notions of time and space changed markets, prolitarianization, alienation, commodification, and the role the government played (or not) in shaping the economy are some of the topics that we will cover. Crosslisted as HIST 226.

ECON 260. Understanding Capitalism. 1 Credit.
Offered Occasionally; Lecture hours:3
The course exposes students to an analysis of how capitalism works via the work of two of its greatest analysts: Karl Marx and John Maynard Keynes. It analyzes the production, distribution, exchange and consumption of material wealth under the laws of capitalism.

ECON 270. South Africa: Social Entrepreneurship. 1 Credit.
Offered Summer Session Only; Lecture hours:15
The course examines the legacy of apartheid and the role of social entrepreneurship in transforming communities. Students are placed in community organizations in nearby townships. Prerequisite: permission of the instructor. Crosslisted as UNIV 284.

ECON 273. Latin American Economic Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course deals with historic and contemporary economic problems, starting from colonial times and reaching the present integration into world economy. Crosslisted as IREL 278 and LAMS 273.

ECON 280. Political Economy of Media and Advertising. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines the interrelationship of cultural, political, and economic aspects of media content and advertising from the perspective of Institutional and Marxian political economy. Prerequisite: ECON 101 or permission of the instructor.

ECON 281. Understanding the Global Economy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:1
This course develops a political economy framework to analyze the global economy. It covers theories of international trade, international finance, economic development, and technological change. The course applies the theoretical tools to assess how globalization influences performance, strategy, and policies within nations and firms, and across industries.

ECON 282. Introduction to Programming for Economics. 1 Credit.
Offered Occasionally; Lecture hours:3
Students are introduced to Python programming and some of its applications in economics and finance. Students develop the necessary skills to bring datasets to Python and answer interesting questions. The course covers the basics of preparing various data types, data visualization, and solving problems. No programming background is needed.

ECON 298. Independent Study. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Individual product or project supervised by a member of the economics department typically resulting in the production of a long research paper. Prerequisites: ECON 101 and permission of the instructor.

ECON 299. Teaching Assistants in Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course can only be taken by economic majors who have permission and have taken the prerequisites. Prerequisites: ECON 202 and ECON 203 and ECON 204 and permission of the instructor.

ECON 2NT. Economics Non-traditional Study. .25-1 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:Varies; Repeatable
Non-traditional study in economics. Prerequisite: permission of the department chair or the instructor.

ECON 304. Financial Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course is focused on theory of finance and asset pricing. Topics include state pricing theory, capital asset pricing model, portfolio theory and risk aversion. Prerequisites: ECON 202 and (MATH 216 or MATH 227 or PSYC 215).

ECON 308. Economics of Innovation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to the important issues related to technological change and innovation – how new technologies impact the economy and our society. The lectures also focus on economic and social policies aimed at promoting growth and development.

ECON 311. Labor Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of economic models related to labor markets, current labor market trends, and the influence of related government policies. Prerequisites: ECON 202 and (MATH 216 or MATH 227 or MATH 304 or PSYC 215).

ECON 313. Public Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An analysis of the government's role in the economy. Topics include the economic rationale for government, expenditure analysis, and the allocative and distributive consequences of taxation. It is strongly recommended that students have one semester of statistics. Prerequisite: ECON 202.

ECON 319. Economic History of Women in the United States. 1 Credit.
Offered Occasionally; Lecture hours:3
An examination of economic models related to labor markets, current labor market trends, and the influence of related government policies. Prerequisite: ECON 202 or ECON 203 or ECON 204. Crosslisted as WMST 318.

ECON 321. Social Theory: Deconstructing Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore how we can understand power in the economy by studying different social theoretical approaches to power. Following a survey of theories of power, we will begin to apply these theories in economic contexts to understand how power hierarchies are created, sustained, maintained and changed.

ECON 326. History of Economic Thought. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Discussion of original sources of economic ideas. Readings about Quesnay, Smith, Ricardo, Marx, Marshall, Keynes, Hayek and others. Prerequisite: ECON 203 with a minimum grade of D and ECON 204 with a minimum grade of D.

ECON 328. Money and Financial Institutions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
An analysis of the role of the financial system in the U.S. economy. Topics include determinants of asset prices, risk management, and financial regulations. Prerequisites: ECON 203 and (MATH 216 or MATH 227).

ECON 330. Law and Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines several areas of law from the "Law and Economics" perspective and analyzes the assumptions that underlie this approach to law. Property rights law, contract law, and tort law will be covered. Prerequisite: ECON 202.

ECON 333. Seminar in Economic Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Guided discussion of economic issues. Topics to be announced at time of preregistration. Prerequisites: ECON 202 and ECON 203 and ECON 204 or permission of the instructor.

ECON 337. International Monetary and Financial Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course covers balance of payments, foreign exchange markets, international monetary systems, the adjustment mechanism, macroeconomic policy in an open economy and monetary integration. Prerequisite: ECON 203 or permission of the instructor.

ECON 339. China & East Asian Economics. 1 Credit.
Lecture hours:3
An analysis of economic transition and development in China, with emphasis on its role in the Asia-Pacific and world economies. Prerequisites: ECON 202 and ECON 203 or permission of the instructor. Crosslisted as EAST 339.

ECON 342. Methods in Experimental Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides students with an introduction to methods used in conducting experimental economics research. The course explores different types of experiments (survey/lab/or field) used in economic research, experimental design and select research topics. Prerequisites: (ECON 202 or ECON 210) and (MATH 216 or MATH 227 or ANOP 102 or PSYC 215).

ECON 350. Classical Marxism. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
The goal is to develop an understanding of Marx's analysis of capitalism by reading mainly original texts by Marx and consider its applications both to disciplinary thinking and contemporary events. Crosslisted as GEOG 350.

ECON 353. Gender & Migration. 1 Credit.
Lecture hours:3
This course focuses on the role of gender in internal and international migrations. It covers gendered motivations for and patterns of migration; the global economy and migration, migration and families, forced migration, migration and economic restructuring, and transnational marriage and identity. Prerequisites ECON 203 or ECON 204 or WMST 150. Crosslisted as WMST 353.

ECON 357. Economic Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The main theories of development; economic and social dualism; agricultural, industrial, and trade strategies; and the role of less developed countries in the emerging global economy. Prerequisites: ECON 202 with a minimum grade of D and ECON 203 with a minimum grade of D and permission of the instructor.

ECON 358. Marxian Economics. 1 Credit.
Lecture hours:3
Applies Marxian value theory and class analysis to understand contemporary U.S. capitalism. Explains how prices are determined and how competition acts to distribute value, revolutionize technology and working conditions, and trigger economic crises. Explores gender and class in the enterprise and household and examines economic democracy as a viable alternative.

ECON 360. Political Economy of Advanced Capitalism: Economic Crises & Conflict. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will focus on the structure and the dynamics of the advanced capitalist economies, including the United States. Among other topics, it will examine the empirical evidence and the theoretical claims of the political economy approach concerning economic and financial crises.

ECON 365. Global Value Chains: How the Modern World Economy Works. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course provides an in-depth analysis of how our modern world capitalist economy organizes the politics and economics of contemporary supply chains by slicing up the financing, production, distribution, exchange, and consumption of the goods and services that we consume across the world.

ECON 398. Independent Study. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual study or project, supervised by instructor. Prerequisites: ECON 202 or ECON 203 or ECON 204 and permission of the instructor.

ECON 402. Economics of Inequality. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
A critical analysis of economic inequality focused on competing frameworks for inequality and proposed visions for what should be done. Topics include class conflict, race and ethnicity, gender, wealth, labor markets and social change. Prerequisites: ECON 202 and ECON 204.

ECON 405. Comparative Economic Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A comparison of the cultures and institutions of modern economic systems. The characteristics of selected capitalist, social democratic and socialist economies are assessed from mainstream, Institutionalist and Marxian analytical perspectives. Prerequisite: ECON 204 or permission of the instructor.

ECON 408. Seminar in Political Economy: The State and The Economy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course analyzes the role of The State in the economy. We will explore alternative theoretical understandings of the role of the state. Following this, we will investigate the role the state is playing in the economy today. Is it the source of problems or the solution to current issues?.

ECON 410. Risk Management in Financial Markets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course is focused on the applications of finance theory in asset pricing and risk management. The topical coverage will extend to fixed income, equity securities, options, derivatives, risk analysis, and hedging strategies. Prerequisite: ECON 202 or permission of the instructor.

ECON 412. Health Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Theoretical and empirical examinations of issues in health economics. Course includes semester-long research project on a health topic. Prerequisites: ECON 202 and (MATH 216 or MATH 227 or MATH 304).

ECON 418. American Economic History. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of the development and influence of American economic institutions from colonial to current times. Prerequisites: ECON 203 and ECON 204.

ECON 422. Experimental Economic Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Experimental economics uses researcher-controlled methods to investigate individual and group decision-making. In this course, students will critically analyze existing experimental economic research through discussion, reading and writing. Students will also learn best practices in experimental economic research through a semester-long research project.

ECON 426. Topics in the History of Economic Thought. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Discussion of the relation between economic ideas and policy in the United States. Readings about Hamilton, Carey, Ely, Commons, Clark, Eccles, Okun, and others. Prerequisite: ECON 203.

ECON 427. International Economic Theory. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Theoretical principles underlying international trade, investment, commercial policy, economic integration, adjustment mechanisms, and balance of payments policy will be examined with an application to current national/international policies. This course isn't open to students that have taken ECON 327. Prerequisites: ECON 203 and ECON 203.

ECON 429. Political Economy of Financial Crises. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore the causes and consequences of financial crises from macroeconomic perspectives, with most of the attention given to the recent financial crisis in the United States. Prerequisite: ECON 204 or permission of the instructor.

ECON 441. Econometric Research. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Advanced panel data methods, instrumental variables and two stage least squares, simultaneous equations, limited dependent variables, sample selection bias, advanced time series, and writing and presenting an empirical research project. Prerequisites: (ECON 202 or ECON 203 or ECON 204) and (ECON 241 or ECON 341).

ECON 444. Senior Seminar in Economic Topics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Topics to be announced at the time of preregistration. Prerequisites: ECON 202 and ECON 203 and ECON 204.

ECON 450. Political Economy of Digital Capitalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
The course examines recent theoretical and empirical debates pertaining to the political economy of digital economic processes and their impact, in turn, on domestic and global development. Prerequisite: ECON 204 or permission of the instructor.

ECON 499. Honors Thesis in Economics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Individual research, leading to an honors thesis in economics, undertaken by qualified students, and supervised by an instructor in the department of economics. Prerequisite: permission of instructor and Honors Council. Prerequisite: ECON 202 or ECON 203 or ECON 204.

Mathematics Courses

MATH 112. Introduction to Mathematical Modeling. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Introduction for the non-specialist to mathematical modeling of real-world phenomena such as voting and networks, using graph theory, probability, and other accessible tools.

MATH 150. Calculus Preparation. .5 Credits.
Offered Fall Semester Only; Lecture hours:3
Exploration of algebraic, exponential, logarithmic and trigonometric functions. Review and use of tools from differential calculus, including limits, to better understand those function classes. Emphasis on modeling and problem-solving techniques. Prerequisite: permission of the instructor.

MATH 192. Topics in Calculus. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3
Elementary calculus and applications taken primarily from economics. Topics include algebraic, exponential, and logarithmic functions, graphs, limits, regular and partial derivatives, constrained optimization, and integration. Not open to students who have MATH 201 credit.

MATH 201. Calculus I. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:4
An introduction to the calculus of algebraic, trigonometric and transcendental functions. Interpretation, significance and calculations of derivatives. Applications to geometry, biology, physics, economics, and other subjects. Introduction to the integral, including the Fundamental Theorem of Calculus and substitution. Not open to students who have MATH 192 credit.

MATH 202. Calculus II. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:4
Methods of integration including integration by parts, numerical approximations, and improper integrals. Sequences and series, including Taylor series. Polar coordinates, parametric functions, differential equations, and applications. Prerequisite: MATH 201.

MATH 203. Introduction to Mathematical Thought. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:1.5
An investigation of number, numeration, and operations from the perspective of elementary school teachers and pupils. Open only to B.S. in Education Early Childhood students. Required fieldwork.

MATH 204. Elementary Geometry and Statistics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:1.5
Investigation of geometric, probabilistic, and statistical concepts related to elementary mathematics and how children learn and make sense of these concepts. Required fieldwork. Prerequisites: MATH 203 or permission of the instructor.

MATH 207. The Teaching of Mathematics in Secondary Schools. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:1.5
Investigation into the components of effective secondary school mathematics instruction, including lesson design/ implementation (curriculum, tasks, discourse, and assessment). Required fieldwork. Prerequisite: EDUC 102 or EDUC 201 or permission of the instructor.

MATH 208. Mathematical Explorations. .5 Credits.
Offered Fall Semester Only; Lecture hours:3
An exploration of topics from pure mathematics, applied mathematics and statistics, illustrating the power and beauty of mathematical reasoning. For students considering a major in mathematics. Corequisites: MATH 201 or MATH 202 or MATH 211 or MATH 212 or MATH 216. Open to first-year students only.

MATH 211. Calculus III. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:4
Calculus of vector-valued functions and functions of several variables. Multiple, line, and surface integrals; applications, and extrema. Green's, Stokes' and Divergence Theorems. Prerequisite: MATH 202.

MATH 212. Differential Equations. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3
Basic methods of solving ordinary differential equations. Systems of linear differential equations, Laplace transform, applications and selected topics. Prerequisite: MATH 211. Not open to students who have taken MATH 222.

MATH 216. Statistics I. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3,Other:1
Exploratory data analysis, sampling and experimental designs, sampling distributions and confidence intervals, hypothesis testing, least squares regression and applications. Statistical software is used and a semester long project with real data is undertaken. Not open to students who have MATH 226, MATH 227, ENGR 226 or PSYC 215 credit.

MATH 217. Statistics II. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
Multiple linear regression, logistic regression and ANOVA. Inferential analysis emphasizing applications to a range of disciplines is conducted using statistical software. Prerequisite: MATH 216 or MATH 227 or equivalent. Students who have taken MATH 405 need instructor permission.

MATH 219. Topics in Applied Mathematics. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Topics such as financial mathematics, mathematical biology, cryptography, social networks, etc. Topic varies by semester. Prerequisite: varies by topic.

MATH 222. Differential Equations for Engineers. .5 Credits.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3
First order differential equations, second order linear equations, higher order linear equations, numerical approximations. Prerequisite: MATH 211. Open only to civil engineering and environmental engineering students. Not open to students who have MATH 212 credit.

MATH 227. Statistics and Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Probability theory, discrete and continuous random variables, sampling distributions and methods of statistical inference including regression and ANOVA. Software is used. Prerequisite: MATH 202. Open only to engineering students and students in computer science. Not open to students who have MATH 216 or ENGR 226 credit.

MATH 230. Data Visualization & Computing. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Simulation-based learning for concepts including sampling, sampling distributions, p-values, and confidence levels. Data visualization beyond simple exploratory data analysis techniques. Advanced statistical software will be used. Prerequisite: MATH 216 or MATH 227 or permission of the instructor.

MATH 240. Applied Combinatorics. .5 Credits.
Offered Spring Semester Only; Lecture hours:3
Counting techniques and traversal problems. Students join MATH 241 mid-semester. Pre- or co-requisite: MATH 280. Only for computer science students or students seeking secondary certification. Not open to students who have taken MATH 340.

MATH 241. Discrete Structures. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3
Logic, sets; mathematical induction; relations, functions; combinatorics and graph theory. Not open to students with MATH 240 or MATH 280 credit. Prerequisite: MATH 202.

MATH 245. Linear Algebra. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3
Linear equations, matrices, vector spaces, linear transformations, eigenvalues, inner products, Gram-Schmidt algorithm, singular value decomposition. Prerequisite: MATH 202.

MATH 280. Logic, Sets, and Proofs. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Logic, sets; proof techniques; relations, functions, sequences and convergence; cardinality. Skills and tools for independent reading, problem solving and exploration. Not open to students with MATH 241 credit. Prerequisite: MATH 211 or MATH 245.

MATH 291. Undergraduate Readings. .25-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Readings and research in special topics at an intermediate level. Prerequisites: permission of the instructor, adviser, and department chair.

MATH 303. Probability. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Elementary probability, random variables, moments, central limit theorem, conditional expectation, statistical distributions derived from the normal distribution. History of the development of Probability. Probability simulations and applications from various fields. Prerequisite: MATH 211.

MATH 304. Statistical Inference Theory. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Point and interval estimation, Fisher's likelihood theory, hypothesis testing, simulation techniques. R or SAS will be used. Prerequisites: MATH 216 or MATH 227 and MATH 303, or permission of the instructor.

MATH 306. Statistical & Data Science Consulting. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Experiential learning course where students work on collaborative data focused projects. Students will communicate findings to stakeholders and engage with important topics related to the art and practice of statistical consulting. Advanced statistical software will be used. Prerequisites: MATH 217 and MATH 230, or permission of the instructor.

MATH 308. Real Analysis I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Real numbers and elementary topology of Cartesian spaces, convergence, continuity, and differentiation. Prerequisites: MATH 211, MATH 245, and MATH 280.

MATH 311. Theory of Numbers. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Classical number theory in an algebraic setting. Topics include unique factorization, diophantine equations, and linear and quadratic congruences. Advanced topics from algebraic or analytic number theory. Prerequisites: MATH 245 and either MATH 241 or MATH 280 or permission of the instructor.

MATH 319. Topics in Advanced Mathematics. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3; Repeatable
Special topics, to be selected from algebra, analysis, geometry, statistics, applied mathematics, etc. Prerequisite varies by topic.

MATH 320. Abstract Algebra I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Groups and rings; homomorphisms, isomorphism theorems; history of the development of algebra. Additional selected topics. Prerequisites: MATH 245 and MATH 280.

MATH 333. Topology. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Topological spaces, connectedness, compactness, continuity, separation, and countability axioms. Metric, product, function, and uniform spaces. Prerequisites: MATH 211 and MATH 280, or permission of the instructor.

MATH 335. Geometry. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Historical and axiomatic foundations of geometry. Euclidean and non-Euclidean geometries. Prerequisite: MATH 280 or permission of the instructor.

MATH 340. Combinatorics & Graph Theory. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
An introduction to combinatorics and graph theory. Topics include counting techniques, permutations, binomial coefficients, partitions, generating functions, graph traversal, spanning trees, matching theory, planar graphs; additional selected topics. Prerequisite: MATH 280 or permission of the instructor.

MATH 342. Topics in Finance or Industry. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Possible topics include industrial mathematics, financial mathematics, genetic algorithms, simulations, and network analysis. Will also include applications to economics and the writing and presenting of a project. Prerequisites: CSCI 203, MATH 245, and MATH 303 or permission of the instructor.

MATH 343. Numerical Analysis. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Floating point arithmetic, development of computational algorithms and error estimates for root approximation, interpolation and approximation by polynomials, numerical differentiation and integration, cubic splines, least-squares, linear systems. Lab component. Prerequisites: Two of (MATH 211, MATH 241, MATH 245, MATH 280) and (CSCI 203 or CSCI 204). Crosslisted as MATH 643.

MATH 345. Advanced Linear Algebra. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Rigorous treatment of linear algebra, including vector spaces, linear independence, span, basis, linear maps, matrices, eigenvalues, eigenvectors, inner products, the spectral theorem (complex and real). Additional topics may include: singular value decomposition, Jordan canonical form, various applications. Prerequisites: MATH 245 and either MATH 280 or permission of the instructor.

MATH 350. Partial Differential Equations. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Partial Differential Equations (PDEs) including the heat equation, wave equation, and Laplace's equation; existence and uniqueness of solutions to PDEs via the maximum principle and energy methods; method of characteristics; Fourier series and integral transforms; separation of variables; Sturm-Liouville theory and orthogonal expansions. Prerequisites: junior or senior status; MATH 212.

MATH 354. Modern Data Analysis. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Advanced methods in modern data analysis. Topics may include principal component analysis, random forest, clustering and classification, unsupervised learning, splines, longitudinal data analysis, survival analysis, time series, spatial statistics, and nonparametric methods. Prerequisite: MATH 230 and MATH 245, or permission of the instructor.

MATH 358. Topics in Operations Research. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Mathematical techniques in operations research. Stochastic processes and mathematical optimization. Topics may include Markov chains, queueing theory, simulation, linear programming, non-linear programming, integer programming, network optimization. Methods and applications drawn from various fields. Prerequisite: MATH 227 or MATH 303 or permission of the instructor. Crosslisted as MATH 658.

MATH 362. Complex Analysis. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Limits, analytic functions, integrals including contour integrals. Cauchy's Integral Theorem, entire functions and singularities. Prerequisites: MATH 211 and MATH 280, or permission of the instructor.

MATH 378. Seminar. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2; Repeatable
Seminar based on topics from algebra, analysis, topology, differential equations, statistics, or applied mathematics; topics selected according to demand or interest. Prerequisite: permission of the instructor.

MATH 391. Reading and Research. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Reading and research in various topics for qualified undergraduate students. Prerequisite: permission of the instructor.

MATH 405. Statistical Modeling. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Theory behind General Linear Models including multiple linear regression and logistic regression. Model diagnostics and remediation. Model selection, multicollinearity. R or SAS will be used. Prerequisites: MATH 245 and MATH 304.

MATH 407. Experimental Design. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Basic and advanced experimental designs (completely randomized, block, crossed, nested and mixed designs, fractional factorial, incomplete block, etc). Corresponding theory and application of estimation procedures including both frequentist and Bayesian estimation techniques. Advanced statistical software will be used. Prerequisite: MATH 304.

MATH 409. Real Analysis II. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Continuation of MATH 308. Integration theory and advanced topics in analysis. Prerequisite: MATH 308.

MATH 416. Advanced Methods in Mathematical Modeling. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
A survey of mathematical models grounded in differential equations and methods used to analyze the behavior of their solutions. Topics may include dynamical systems, asymptotics, perturbation methods, variational methods, numerical methods and scientific computing. Prerequisites: MATH 212 and MATH 308 or permission of the instructor. Crosslisted as MATH 616.

MATH 446. Abstract Algebra II. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Continuation of MATH 320. Advanced topics in group theory including solvable groups, field theory and Galois theory. Prerequisite: MATH 320.

MATH 491. Reading and Research. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Reading and research in various topics for qualified undergraduates or graduate students at a level appropriate for a Culminating Experience. Prerequisite: permission of the instructor, adviser, and department chair.

Mathematics & Statistics

Faculty

Professors: kb Boomer, M. Lynn Breyfogle, Peter Brooksbank, Thomas Cassidy (Associate Provost for Academic Affairs), Emily B. Dryden, George R. Exner, Peter McNamara, Nathan C. Ryan, Linda B. Smolka, Karl Voss (Dean of the College of Arts & Sciences)

Associate Professors: Kelly A. Bickel, Van T. Cyr, Lara K. Dick, Abby Flynt (Chair), Sharon A. Garthwaite, Christina Hamlet, Jeffrey Langford, Kelly McConville (Director for the Dominguez Center for Data Science)

Assistant Professors: Jennifer Berg, Sanjay Dharmavaram, Amy Donner (Teaching), Samuel C. Gutekunst, Keegan Kang, Adam Mair, Aaron Osgood-Zimmerman, Sara Stoudt, Lucas Waddell, Angela Wu

Visiting Assistant Professors: Ángel Chávez, Ryan Reynolds

Postdoctoral Fellow: Manuel Albrizzio

Mathematics has long been the language of the natural sciences and has been studied for its own sake since ancient times. Statistics is the foundational tool for understanding and analyzing data from a wide variety of sources and also an area of active research in its own right. An understanding of the basics of calculus, statistics and linear algebra has become a requirement for proficiency in many of the social sciences. The study of mathematics or statistics has rewards because accomplishment in the subjects, even at a relatively elementary level, requires and promotes clarity of both thought and expression. For many, the study of mathematics offers entrance into an exciting world of challenges where beauty and utility coexist in balanced harmony. The study of statistics is the bridge between data and understanding and offers insights otherwise unobtainable.

A major in mathematics, applied mathematics or statistics opens the door to a wide range of employment opportunities as the analytical skills that a student develops in pursuing these majors are greatly valued by potential employers. There are, for example, excellent career prospects in actuarial work and in the rapidly growing areas of analytics, biomathematics and biostatistics, modeling (in industry, government and finance) and cryptology (in banking, television, the Internet and elsewhere). These majors can also be seen as the first step toward obtaining a graduate degree in one of the mathematical sciences or constitute preparation for a professional degree program in a field such as education, medicine, law or business.

Mathematics Majors and Statistics Majors

The Mathematics Department offers four majors. Students may earn a Bachelor of Arts in Mathematics, a Bachelor of Science in Mathematics, a Bachelor of Science in Applied Mathematics or a Bachelor of Science in Statistics. The choice of degree program depends largely upon the student's mathematical or statistical objectives and interests in fields other than mathematics. Students with strong interests outside mathematics have options including a Bachelor of Science in Applied Mathematics, a Bachelor of Arts in Mathematics or a Bachelor of Science in the Mathematical Economics (p. 212) program.

Students in each major complete an introductory year of calculus during their first year, or fulfill this requirement by achieving a high score on the Advanced Placement Test of the College Entrance Examination Board. Students with a strong interest in a career in mathematics or science – and in particular, students planning to continue on to Ph.D. programs in the mathematical sciences – are strongly advised to take courses beyond the minimum requirements for the major. Since the number of courses to be taken in any one department is restricted to 12 for a Bachelor of Arts degree, such students are advised to choose one of the Bachelor of Science majors.

Students pursuing a BS in Statistics or a BS in Mathematics are eligible to pursue a BA in Data Science (p. 92) as a co-major. Complementing the depth a student receives from their primary major, the BA in Data Science provides breadth across the interdisciplinary field of data science. The major is not intended as – nor can it be declared as – a stand-alone course of study.

Bachelor of Arts in Mathematics

The **Bachelor of Arts in Mathematics** major consists of eight mathematics courses beyond the introductory year of calculus, plus one additional course in a related field and a Culminating Experience.

Of the eight mathematics courses beyond the introductory year of calculus, five are specified:

Program Requirements		
MATH 211	Calculus III	1
MATH 245	Linear Algebra	1
MATH 280	Logic, Sets, and Proofs	1
MATH 308	Real Analysis I	1

MATH 320	Abstract Algebra I	1
Electives		
Three electives at the 300 or 400 level		3
Related Field Course		
Select one of the following:		1
Fourth mathematics course at the 300 or 400 level		
MATH 207	The Teaching of Mathematics in Secondary Schools	
MATH 212	Differential Equations	
MATH 216	Statistics I	
MATH 217	Statistics II	
MATH 219	Topics in Applied Mathematics	
MATH 230	Data Visualization & Computing	
An additional full-credit course in which college-level mathematics or statistics plays a major role. [1]		
A Culminating Experience [2]		
Total Credits: 11-12		

1 Examples include any computer science or science course (beyond those required for all liberal arts students), including nearly all courses in computer science or physics at or above the 200 level, or an appropriate course from humanities, social sciences or engineering in which mathematics plays a significant role at a reasonable level of sophistication.

2 The requirement for a *Culminating Experience* within the major may be satisfied in any of the following ways: (1) taking a full-credit, 400-level mathematics course; or (2) completing a guided research project, such as an honors thesis, in mathematics, statistics, mathematics education or applied mathematics. This project should extend beyond one semester and include an initial proposal, a final product and a public presentation of results; or (3) completing student teaching for secondary certification. The Culminating Experience may be non-credit bearing. Students earning a Bachelor of Arts in Mathematics may count a 400-level mathematics course both as their mathematics-related course and as the Culminating Experience. The Culminating Experience may be undertaken in the spring of junior year or the fall or spring of senior year.

The mathematics department chair shall make the determination of whether or not a particular course outside the mathematics department may count as the course in a related field.

The College of Arts & Sciences Core Curriculum disciplinary depth requirements for the bachelor of arts major are satisfied as follows:

- *writing within the major* in MATH 280 Logic, Sets, and Proofs, MATH 308 Real Analysis I and MATH 320 Abstract Algebra I (all W2 courses);
- *information literacy* in MATH 280 Logic, Sets, and Proofs and MATH 308 Real Analysis I;
- *formal presentation* as part of the Culminating Experience.

Students with a special interest in pure mathematics or statistics may earn formal concentration in these areas by completing an appropriate suite of 300 and 400-level courses, as described below.

Pure Mathematics Concentration

MATH 345	Advanced Linear Algebra	1
MATH 409	Real Analysis II	1
MATH 446	Abstract Algebra II	1
Select two of the following:		2
MATH 311	Theory of Numbers	
MATH 333	Topology	
MATH 362	Complex Analysis	

Statistics Concentration

MATH 303	Probability	1
MATH 304	Statistical Inference Theory	1
Three courses from the following, subject to: at least one of MATH 405 and MATH 407, and no more than one of MATH 345 and MATH 409 may count toward this requirement.		3
MATH 306	Statistical & Data Science Consulting	
MATH 345	Advanced Linear Algebra	
MATH 354	Modern Data Analysis	
MATH 405	Statistical Modeling	

MATH 407	Experimental Design	
MATH 409	Real Analysis II	

Bachelor of Science in Mathematics

The **Bachelor of Science in Mathematics** major requires 10 mathematics courses beyond the introductory year of calculus, a computing course, two physics courses, an additional lab science course and a Culminating Experience.

Six of the 10 mathematics courses are specified:

Program Requirements		
MATH 211	Calculus III	1
MATH 212	Differential Equations	1
MATH 245	Linear Algebra	1
MATH 280	Logic, Sets, and Proofs	1
MATH 308	Real Analysis I	1
MATH 320	Abstract Algebra I	1
Electives		
Four mathematics electives at the 300 or 400 level		4
PHYS 211	Classical and Modern Physics I	1
PHYS 212	Classical and Modern Physics II	1
CSCI 203	Introduction to Computer Science	1
One additional laboratory science course. [3]		1
A Culminating Experience. [4]		

[3] The additional laboratory science course may be chosen from any discipline in the natural sciences or from computer science. Any course in physics beyond PHYS 212 Classical and Modern Physics II, and any laboratory course in computer science beyond CSCI 203 Introduction to Computer Science, may be chosen.

[4] The requirement for a *Culminating Experience* within the major may be satisfied in any of the following ways: (1) taking a full credit 400-level mathematics course; or (2) completing a guided research project, such as an honors thesis, in mathematics, statistics, mathematics education, or applied mathematics. This project should extend beyond one semester and include an initial proposal, a final product, and a public presentation of results; or (3) completing student teaching for secondary certification. The Culminating Experience may be non-credit bearing. The Culminating Experience may not double count as one of the mathematics electives required in the major. The course for a Culminating Experience may be undertaken in the spring of junior year or the fall or spring of senior year.

The College of Arts & Sciences Core Curriculum disciplinary depth requirements for the bachelor of science major are satisfied as follows:

- *writing within the major* in MATH 280 Logic, Sets, and Proofs, MATH 308 Real Analysis I and MATH 320 Abstract Algebra I (all W2 courses);
- *information literacy* in MATH 280 Logic, Sets, and Proofs and MATH 308 Real Analysis I;
- *formal presentation* as part of the Culminating Experience.

Students with a special interest in pure mathematics or statistics may earn formal concentration in these areas by completing an appropriate suite of 300 and 400-level courses, as described below. In particular, those intending to pursue graduate study in mathematics or statistics should plan to complete the relevant concentration.

Pure Mathematics Concentration

MATH 345	Advanced Linear Algebra	1
MATH 409	Real Analysis II	1
MATH 446	Abstract Algebra II	1
Select two of the following:		2
MATH 311	Theory of Numbers	
MATH 333	Topology	
MATH 362	Complex Analysis	

Statistics Concentration

MATH 303	Probability	1
MATH 304	Statistical Inference Theory	1

Three courses from the following, subject to: at least one of MATH 405 and MATH 407, and no more than one of MATH 345 and MATH 409 may count toward this requirement.		3
MATH 306	Statistical & Data Science Consulting	
MATH 345	Advanced Linear Algebra	
MATH 354	Modern Data Analysis	
MATH 405	Statistical Modeling	
MATH 407	Experimental Design	
MATH 409	Real Analysis II	

A sample sequence for the Bachelor of Science in Mathematics major is provided below. It should be noted that each student's sequence will be unique depending on when the program is started, the number of AP or transfer credits applied and when the desired courses are offered.

First Year

First Semester	Credits	Second Semester	Credits
MATH 201	1	MATH 202	1
PHYS 211	1	PHYS 212	1
	2		**2**

Sophomore

First Semester	Credits	Second Semester	Credits
MATH 211	1	MATH 212	1
MATH 245	1	MATH 280	1
CSCI 203	1	Laboratory science	1
	3		**3**

Junior

First Semester	Credits	Second Semester	Credits
MATH 308 or 320	1	MATH 308 or 320	1
Elective in mathematics	1	Elective in mathematics	1
	2		**2**

Senior

First Semester	Credits	Second Semester	Credits
Elective in mathematics	1	Elective in mathematics	1
		Culminating Experience	1
	1		**2**

Total Credits: 17

Bachelor of Science in Applied Mathematics

The **Bachelor of Science in Applied Mathematics** major requires nine mathematics courses beyond the introductory year of calculus, a computing course, at least three approved courses in an approved program, and a Culminating Experience. More specifically, there are six required core mathematics courses consisting of:

Program Requirements		
MATH 211	Calculus III	1
MATH 212	Differential Equations	1
MATH 245	Linear Algebra	1
MATH 280	Logic, Sets, and Proofs	1
MATH 303	Probability	1
MATH 308	Real Analysis I	1
Elective Courses		
Three elective courses in applied mathematics		3
A Culminating Experience [5]		
One computing course		1
Three approved partner courses		3
Total Credits		**13**

[5] The requirement for a Culminating Experience within the major may be satisfied in any of the following ways: (1) taking a full credit 400-level mathematics course; or (2) completing a guided research project, such as an honors thesis, in mathematics, statistics, mathematics education, or applied mathematics. This project should extend beyond one semester and include an initial proposal, a final product, and a public presentation of results; or (3) completing student teaching for secondary certification. The Culminating Experience may be non-credit bearing. The Culminating Experience may not double-count as one of the mathematics electives required in the major. While the Culminating Experience may be met in any of the ways specified above, students earning a Bachelor of Science in Applied Mathematics are strongly encouraged to consider the option of a thesis or research experience integrating the outside coursework. The course for a Culminating Experience may be undertaken in the spring of junior year or the fall or spring of senior year.

The College of Arts & Sciences Core Curriculum disciplinary depth requirements for Bachelor of Science in Applied Mathematics major are satisfied as follows:

- *writing within the major* in MATH 280 Logic, Sets, and Proofs and MATH 308 Real Analysis I (both W2 courses);
- *information literacy* in MATH 308 Real Analysis I;
- *formal presentation* as part of the culminating experience.

Applied Mathematics Electives

Select three of the following:		**3**
MATH 342	Topics in Finance or Industry	
MATH 343	Numerical Analysis	
MATH 345	Advanced Linear Algebra	
MATH 350	Partial Differential Equations	
MATH 358	Topics in Operations Research	
MATH 362	Complex Analysis	
MATH 409	Real Analysis II	
MATH 416	Advanced Methods in Mathematical Modeling	
Total Credits		**3**

Alternative 300 or 400-level mathematics courses could count toward the electives if deemed appropriate by the academic adviser in consultation with the mathematics department chair.

The **computing course** may be a computer science course at or above the 200 level, or a computing course appropriate to the program of study as determined through consultation with the academic adviser and the mathematics department chair.

Outside Coursework (Partner Courses)

For the purpose of completing a coherent sequence of courses that provide a solid introduction to the discipline, all students must partner with an approved department or program in a discipline that applies mathematics. In this regard, a minimum of three approved courses chosen in consultation with the mathematics department adviser and the outside department or program is required. A partner department/program will usually be chosen from the College of Engineering, the Freeman College of Management, the Division of Social Sciences, or the Division of Natural Sciences. Entering students may declare the intended major in the summer after acceptance to Bucknell, but must consult with the mathematics department and formally declare the outside coursework by the end of their third semester. All other students must consult with the mathematics department at the point of declaring the major and specify the outside coursework. In either case, the mathematics department will consult with the partner department or program to ensure that the coursework is appropriate and can be completed.

A sample sequence for the Bachelor of Science in Applied Mathematics major is provided below. It should be noted that each student's sequence will be unique depending on when the program is started, how many AP or transfer credits are applied, and when the desired courses are offered.

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 201	1	MATH 202	1
		Computing course	1
	1		**2**
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 211	1	MATH 212	1
Outside course	1	MATH 245	1

		Outside course	1
	2		**3**

Junior

First Semester	**Credits**	**Second Semester**	**Credits**
MATH 280	1	MATH 308	1
MATH 303	1	MATH elective	1
Outside course	1		
	3		**2**

Senior

First Semester	**Credits**	**Second Semester**	**Credits**
MATH elective	1	MATH elective	1
Culminating experience			
	1		**1**

Total Credits: 15

Bachelor of Science in Statistics

The **Bachelor of Science in Statistics** major requires 13 mathematics and statistics courses beyond the introductory year of calculus, a computing course, and a Culminating Experience, which may double count with one of the 400-level requirements or electives.

Ten of the 13 mathematics and statistics courses are specified:

MATH 211	Calculus III	1
MATH 216	Statistics I	1
MATH 217	Statistics II	1
MATH 230	Data Visualization & Computing	1
MATH 245	Linear Algebra	1
MATH 280	Logic, Sets, and Proofs	1
MATH 303	Probability	1
MATH 304	Statistical Inference Theory	1
MATH 308	Real Analysis I	1
MATH 405	Statistical Modeling	1
Three elective courses from the following list, two of which must be selected from MATH 306, MATH 354, MATH 407, or MATH 409		3
MATH 306	Statistical & Data Science Consulting	
MATH 345	Advanced Linear Algebra	
MATH 354	Modern Data Analysis	
MATH 358	Topics in Operations Research	
MATH 407	Experimental Design	
MATH 409	Real Analysis II	
Required Computer Science Course		
CSCI 203	Introduction to Computer Science	

Total Credits: 16-17

The requirement for a Culminating Experience within the major may be satisfied in any of the following ways: (1) taking one of the courses MATH 405 Statistical Modeling, MATH 407 Experimental Design, or MATH 409 Real Analysis II; or (2) completing a guided research project, such as an honors thesis, in statistics or a related area as determined by the department. This project should extend beyond one semester and include an initial proposal, a final product, and a public presentation of results. The Culminating Experience may be non-credit bearing. The Culminating Experience may double count with MATH 405 Statistical Modeling or with one of the 400-level mathematics electives listed for the major. The Culminating Experience may be undertaken in the spring of junior year or the fall or spring of senior year.

The College of Arts & Sciences Core Curriculum disciplinary depth requirements for the Bachelor of Science in Statistics major are satisfied as follows:

- *writing within the major* in MATH 216 Statistics I, MATH 280 Logic, Sets, and Proofs, MATH 308 Real Analysis I (all W2 courses);
- *information literacy* in MATH 280 Logic, Sets, and Proofs and MATH 308 Real Analysis I;
- *formal presentation* as part of the culminating experience.

A sample sequence for the Bachelor of Science in Statistics major is provided below. It should be noted that each student's sequence will be unique depending on when the program is started, the number of AP or transfer credits applied, and when the desired courses are offered.

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 201	1	MATH 202	1
CSCI 203	1	MATH 216	1
	2		**2**
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 211	1	MATH 230	1
MATH 217	1	MATH 280	1
	2		**2**
Junior			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 245	1	MATH 304	1
MATH 303	1	MATH 308	1
		Culminating Experience[1]	0-1
	2		**2-3**
Senior			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 405	1	Elective 2	
Elective 1		MATH 345, 358, 407, or 409	1
MATH 306, 354, 345, or 409	1	Elective 3	
		MATH 345, 358, 407, or 409	1
	2		**2**
Total Credits: 16-17			

[1] Please note the Culminating Experience may be taken in the spring of the junior year or in the fall or spring of the senior year.

Departmental Honors

Students who complete departmental honors should have a grade point average of at least 3.5 both in their mathematics courses and overall. By the end of their junior year, students in the Bachelor of Arts in Mathematics major or Bachelor of Science in Mathematics major must have completed a total of at least three mathematics courses at the 300- or 400-level, including MATH 308 Real Analysis I or MATH 320 Abstract Algebra I. Students in the Bachelor of Science in Applied Mathematics major must have completed a total of at least three mathematics courses at the 300- or 400-level by the end of their junior year; two such courses suffice if one of them is MATH 308 Real Analysis I. By the end of their junior year students in the Bachelor of Science in Statistics major must have completed a total of at least three mathematics courses at the 300- or 400-level, including MATH 308 Real Analysis I. To be accepted into the Honors Program, a student must satisfy all other requirements as put forth by the University Honors Council. The student must then complete an honors thesis under the adviser's direction and pass a thesis examination in accordance with the requirements of the University Honors Council. Such students may earn course credit for their thesis work by signing up for at least one half-credit of independent study per semester.

Secondary Teacher Certification

Prospective secondary school teachers (grades 7 – 12) must complete one of the four majors within the department. This certification requires specific mathematics and education courses. Students seeking teacher certification should confer as early as possible with the mathematics and education departments to devise a program of study, which normally will include all requirements for certification in the Commonwealth of Pennsylvania.

Mathematics Minor

A **minor** in mathematics consists of either:

MATH courses MATH 211 or above (need credit for at least one of MATH 211, MATH 212, MATH 241, MATH 245, or MATH 280 and at least one course must be at the 300 or 400 level)	4
Total Credits	**4**

or

MATH courses MATH 211 or above (need credit for at least one of MATH 211, MATH 212, MATH 241, MATH 245, or MATH 280 and at least two courses must be at the 300 or 400 level)	3
Total Credits	**3**

All credits counted toward the minor must come from courses taken at Bucknell University.

Mathematics (Statistics) Specific Minor

The minor may be specified as mathematics (statistics) if at least two of the required credits are from among the following list, with no more than one credit from MATH 217 Statistics II and MATH 230 Data Visualization & Computing:

MATH 217	Statistics II	1
MATH 230	Data Visualization & Computing	1
MATH 303	Probability	1
MATH 304	Statistical Inference Theory	1
MATH 306	Statistical Consulting	1
MATH 354	Modern Data Analysis	1
MATH 405	Statistical Modeling	1
MATH 407	Experimental Design	1

Mathematics (Applied/Modeling Mathematics) Specific Minor

The minor may be specified as mathematics (applied/modeling mathematics) if at least two of the required credits are from among the courses:

MATH 212	Differential Equations	1
MATH 219	Topics in Applied Mathematics	1
MATH 342	Topics in Finance or Industry	1
MATH 343	Numerical Analysis	1
MATH 350	Partial Differential Equations	1
MATH 358	Topics in Operations Research	1

Applied Statistics Minor

A minor in applied statistics consists of:

MATH 216 or MATH 227 [1]		1
MATH 217	Statistics II	1
MATH 230	Data Visualization & Computing	1
MATH 306	Statistical & Data Science Consulting	1

[1] Students with credit for PSYC 215 or ENGR 226 should contact the chair of the mathematics department regarding ways to satisfy the MATH 216 credit. For students with transfer credit for MATH 216, an acceptable replacement for this requirement is one of: DATA 250, ANOP 330, CSCI 349, CSCI 365, GEOL 230, GEOL 334, GEOG 204, GEOG 205, BIOL 364, HUMN 270, POLS 296.

All credits counted toward the minor must come from courses taken at Bucknell University.

The Department of Mathematics aims to provide both majors and non-majors with the mathematical and statistical knowledge and skills needed to succeed in their chosen field of endeavor. It is also intended that the student experience the elegance and broader impacts of the discipline.

Students earning a BA or BS in Mathematics, a BS in Applied Mathematics or a BS in Statistics will:

1. Demonstrate knowledge of the principal definitions and theorems in the canon of undergraduate mathematical sciences. (1, 6)
2. Be able to communicate mathematical thought. (1, 7)
3. Apply effectively appropriate quantitative tools and logical modes of thinking to analyze and synthesize information in problem solving situations. (1, 2, 6)
4. Experience the breadth of mathematics and statistics. (2, 9)

Numbers in parentheses reflect related Educational Goals of Bucknell University.

Courses

MATH 112. Introduction to Mathematical Modeling. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Introduction for the non-specialist to mathematical modeling of real-world phenomena such as voting and networks, using graph theory, probability, and other accessible tools.

MATH 150. Calculus Preparation. .5 Credits.
Offered Fall Semester Only; Lecture hours:3
Exploration of algebraic, exponential, logarithmic and trigonometric functions. Review and use of tools from differential calculus, including limits, to better understand those function classes. Emphasis on modeling and problem-solving techniques. Prerequisite: permission of the instructor.

MATH 192. Topics in Calculus. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3
Elementary calculus and applications taken primarily from economics. Topics include algebraic, exponential, and logarithmic functions, graphs, limits, regular and partial derivatives, constrained optimization, and integration. Not open to students who have MATH 201 credit.

MATH 201. Calculus I. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:4
An introduction to the calculus of algebraic, trigonometric and transcendental functions. Interpretation, significance and calculations of derivatives. Applications to geometry, biology, physics, economics, and other subjects. Introduction to the integral, including the Fundamental Theorem of Calculus and substitution. Not open to students who have MATH 192 credit.

MATH 202. Calculus II. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:4
Methods of integration including integration by parts, numerical approximations, and improper integrals. Sequences and series, including Taylor series. Polar coordinates, parametric functions, differential equations, and applications. Prerequisite: MATH 201.

MATH 203. Introduction to Mathematical Thought. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:1.5
An investigation of number, numeration, and operations from the perspective of elementary school teachers and pupils. Open only to B.S. in Education Early Childhood students. Required fieldwork.

MATH 204. Elementary Geometry and Statistics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:1.5
Investigation of geometric, probabilistic, and statistical concepts related to elementary mathematics and how children learn and make sense of these concepts. Required fieldwork. Prerequisites: MATH 203 or permission of the instructor.

MATH 207. The Teaching of Mathematics in Secondary Schools. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:1.5
Investigation into the components of effective secondary school mathematics instruction, including lesson design/ implementation (curriculum, tasks, discourse, and assessment). Required fieldwork. Prerequisite: EDUC 102 or EDUC 201 or permission of the instructor.

MATH 208. Mathematical Explorations. .5 Credits.
Offered Fall Semester Only; Lecture hours:3
An exploration of topics from pure mathematics, applied mathematics and statistics, illustrating the power and beauty of mathematical reasoning. For students considering a major in mathematics. Corequisites: MATH 201 or MATH 202 or MATH 211 or MATH 212 or MATH 216. Open to first-year students only.

MATH 211. Calculus III. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:4
Calculus of vector-valued functions and functions of several variables. Multiple, line, and surface integrals; applications, and extrema. Green's, Stokes' and Divergence Theorems. Prerequisite: MATH 202.

MATH 212. Differential Equations. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3
Basic methods of solving ordinary differential equations. Systems of linear differential equations, Laplace transform, applications and selected topics. Prerequisite: MATH 211. Not open to students who have taken MATH 222.

MATH 216. Statistics I. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3,Other:1
Exploratory data analysis, sampling and experimental designs, sampling distributions and confidence intervals, hypothesis testing, least squares regression and applications. Statistical software is used and a semester long project with real data is undertaken. Not open to students who have MATH 226, MATH 227, ENGR 226 or PSYC 215 credit.

MATH 217. Statistics II. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
Multiple linear regression, logistic regression and ANOVA. Inferential analysis emphasizing applications to a range of disciplines is conducted using statistical software. Prerequisite: MATH 216 or MATH 227 or equivalent. Students who have taken MATH 405 need instructor permission.

MATH 219. Topics in Applied Mathematics. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Topics such as financial mathematics, mathematical biology, cryptography, social networks, etc. Topic varies by semester. Prerequisite: varies by topic.

MATH 222. Differential Equations for Engineers. .5 Credits.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3
First order differential equations, second order linear equations, higher order linear equations, numerical approximations. Prerequisite: MATH 211. Open only to civil engineering and environmental engineering students. Not open to students who have MATH 212 credit.

MATH 227. Statistics and Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Probability theory, discrete and continuous random variables, sampling distributions and methods of statistical inference including regression and ANOVA. Software is used. Prerequisite: MATH 202. Open only to engineering students and students in computer science. Not open to students who have MATH 216 or ENGR 226 credit.

MATH 230. Data Visualization & Computing. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Simulation-based learning for concepts including sampling, sampling distributions, p-values, and confidence levels. Data visualization beyond simple exploratory data analysis techniques. Advanced statistical software will be used. Prerequisite: MATH 216 or MATH 227 or permission of the instructor.

MATH 240. Applied Combinatorics. .5 Credits.
Offered Spring Semester Only; Lecture hours:3
Counting techniques and traversal problems. Students join MATH 241 mid-semester. Pre- or co-requisite: MATH 280. Only for computer science students or students seeking secondary certification. Not open to students who have taken MATH 340.

MATH 241. Discrete Structures. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:3
Logic, sets; mathematical induction; relations, functions; combinatorics and graph theory. Not open to students with MATH 240 or MATH 280 credit. Prerequisite: MATH 202.

MATH 245. Linear Algebra. 1 Credit.
Offered Both Fall and Spring,TLC Tutoring Course; Lecture hours:3
Linear equations, matrices, vector spaces, linear transformations, eigenvalues, inner products, Gram-Schmidt algorithm, singular value decomposition. Prerequisite: MATH 202.

MATH 280. Logic, Sets, and Proofs. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Logic, sets; proof techniques; relations, functions, sequences and convergence; cardinality. Skills and tools for independent reading, problem solving and exploration. Not open to students with MATH 241 credit. Prerequisite: MATH 211 or MATH 245.

MATH 291. Undergraduate Readings. .25-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Readings and research in special topics at an intermediate level. Prerequisites: permission of the instructor, adviser, and department chair.

MATH 303. Probability. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Elementary probability, random variables, moments, central limit theorem, conditional expectation, statistical distributions derived from the normal distribution. History of the development of Probability. Probability simulations and applications from various fields. Prerequisite: MATH 211.

MATH 304. Statistical Inference Theory. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Point and interval estimation, Fisher's likelihood theory, hypothesis testing, simulation techniques. R or SAS will be used. Prerequisites: MATH 216 or MATH 227 and MATH 303, or permission of the instructor.

MATH 306. Statistical & Data Science Consulting. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Experiential learning course where students work on collaborative data focused projects. Students will communicate findings to stakeholders and engage with important topics related to the art and practice of statistical consulting. Advanced statistical software will be used. Prerequisites: MATH 217 and MATH 230, or permission of the instructor.

MATH 308. Real Analysis I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Real numbers and elementary topology of Cartesian spaces, convergence, continuity, and differentiation. Prerequisites: MATH 211, MATH 245, and MATH 280.

MATH 311. Theory of Numbers. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Classical number theory in an algebraic setting. Topics include unique factorization, diophantine equations, and linear and quadratic congruences. Advanced topics from algebraic or analytic number theory. Prerequisites: MATH 245 and either MATH 241 or MATH 280 or permission of the instructor.

MATH 319. Topics in Advanced Mathematics. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3; Repeatable
Special topics, to be selected from algebra, analysis, geometry, statistics, applied mathematics, etc. Prerequisite varies by topic.

MATH 320. Abstract Algebra I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Groups and rings; homomorphisms, isomorphism theorems; history of the development of algebra. Additional selected topics. Prerequisites: MATH 245 and MATH 280.

MATH 333. Topology. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Topological spaces, connectedness, compactness, continuity, separation, and countability axioms. Metric, product, function, and uniform spaces. Prerequisites: MATH 211 and MATH 280, or permission of the instructor.

MATH 335. Geometry. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Historical and axiomatic foundations of geometry. Euclidean and non-Euclidean geometries. Prerequisite: MATH 280 or permission of the instructor.

MATH 340. Combinatorics & Graph Theory. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
An introduction to combinatorics and graph theory. Topics include counting techniques, permutations, binomial coefficients, partitions, generating functions, graph traversal, spanning trees, matching theory, planar graphs; additional selected topics. Prerequisite: MATH 280 or permission of the instructor.

MATH 342. Topics in Finance or Industry. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Possible topics include industrial mathematics, financial mathematics, genetic algorithms, simulations, and network analysis. Will also include applications to economics and the writing and presenting of a project. Prerequisites: CSCI 203, MATH 245, and MATH 303 or permission of the instructor.

MATH 343. Numerical Analysis. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Floating point arithmetic, development of computational algorithms and error estimates for root approximation, interpolation and approximation by polynomials, numerical differentiation and integration, cubic splines, least-squares, linear systems. Lab component. Prerequisites: Two of (MATH 211, MATH 241, MATH 245, MATH 280) and (CSCI 203 or CSCI 204). Crosslisted as MATH 643.

MATH 345. Advanced Linear Algebra. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Rigorous treatment of linear algebra, including vector spaces, linear independence, span, basis, linear maps, matrices, eigenvalues, eigenvectors, inner products, the spectral theorem (complex and real). Additional topics may include: singular value decomposition, Jordan canonical form, various applications. Prerequisites: MATH 245 and either MATH 280 or permission of the instructor.

MATH 350. Partial Differential Equations. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Partial Differential Equations (PDEs) including the heat equation, wave equation, and Laplace's equation; existence and uniqueness of solutions to PDEs via the maximum principle and energy methods; method of characteristics; Fourier series and integral transforms; separation of variables; Sturm-Liouville theory and orthogonal expansions. Prerequisites: junior or senior status; MATH 212.

MATH 354. Modern Data Analysis. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Advanced methods in modern data analysis. Topics may include principal component analysis, random forest, clustering and classification, unsupervised learning, splines, longitudinal data analysis, survival analysis, time series, spatial statistics, and nonparametric methods. Prerequisite: MATH 230 and MATH 245, or permission of the instructor.

MATH 358. Topics in Operations Research. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Mathematical techniques in operations research. Stochastic processes and mathematical optimization. Topics may include Markov chains, queueing theory, simulation, linear programming, non-linear programming, integer programming, network optimization. Methods and applications drawn from various fields. Prerequisite: MATH 227 or MATH 303 or permission of the instructor. Crosslisted as MATH 658.

MATH 362. Complex Analysis. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Limits, analytic functions, integrals including contour integrals. Cauchy's Integral Theorem, entire functions and singularities. Prerequisites: MATH 211 and MATH 280, or permission of the instructor.

MATH 378. Seminar. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2; Repeatable
Seminar based on topics from algebra, analysis, topology, differential equations, statistics, or applied mathematics; topics selected according to demand or interest. Prerequisite: permission of the instructor.

MATH 391. Reading and Research. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Reading and research in various topics for qualified undergraduate students. Prerequisite: permission of the instructor.

MATH 405. Statistical Modeling. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Theory behind General Linear Models including multiple linear regression and logistic regression. Model diagnostics and remediation. Model selection, multicollinearity. R or SAS will be used. Prerequisites: MATH 245 and MATH 304.

MATH 407. Experimental Design. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Basic and advanced experimental designs (completely randomized, block, crossed, nested and mixed designs, fractional factorial, incomplete block, etc). Corresponding theory and application of estimation procedures including both frequentist and Bayesian estimation techniques. Advanced statistical software will be used. Prerequisite: MATH 304.

MATH 409. Real Analysis II. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Continuation of MATH 308. Integration theory and advanced topics in analysis. Prerequisite: MATH 308.

MATH 416. Advanced Methods in Mathematical Modeling. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
A survey of mathematical models grounded in differential equations and methods used to analyze the behavior of their solutions. Topics may include dynamical systems, asymptotics, perturbation methods, variational methods, numerical methods and scientific computing. Prerequisites: MATH 212 and MATH 308 or permission of the instructor. Crosslisted as MATH 616.

MATH 446. Abstract Algebra II. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Continuation of MATH 320. Advanced topics in group theory including solvable groups, field theory and Galois theory. Prerequisite: MATH 320.

MATH 491. Reading and Research. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Reading and research in various topics for qualified undergraduates or graduate students at a level appropriate for a Culminating Experience. Prerequisite: permission of the instructor, adviser, and department chair.

Music

Faculty

Professor: William E. Kenny

Associate Professors: Paul Botelho, Bethany Collier (Academic Associate Dean of Arts & Sciences), Qing Jiang, Ryan Malone (Chair), Emily Martin, Sezi Seskir

Assistant Professors: Benjamin Barson, Caleb Hopkins, Nicholas Roseth, Daniel Temkin

Visiting Assistant Professors: Frank Lakatos, Tyler Yamin

Adjunct Artist Affiliates: Ronald L. Bixler, Leslie Cullen, Devin Flynt, Robert Andrew Hart, Phil Haynes, Robert LaBarca, Dale A. Orris, Anthony Poehailos, Nelson Rodríguez-Parada, Susannah Stewart, Garet Holdren, Joseph Klinger, Kristin Stephenson

Adjunct Instructors: Dale A. Orris, Robert Riker, Kristin Stephenson

In the Department of Music, a faculty of active performers, composers and scholars collaborates with students in the critical and creative study of music from diverse historical periods and cultural traditions, engaging the mind and ear in a process that develops artistic, aesthetic and human understanding.

Resources

The Sigfried Weis Music Building has well-equipped faculty studios; 11 practice rooms with pianos; a percussion studio; an electroacoustic music studio; an electronic keyboard lab; two classrooms; and the Natalie Davis Rooke Recital Hall, a 164-seat performance space with two Steinway concert

grand pianos and a recording booth with live streaming capacity. The music building also houses its own music library of scores, published recordings, an archive of student and guest performance recordings, the Bruce Lundvall Collection of Jazz Recordings, and the Cook Collection of Musical Instruments. The department offers dozens of musical events every year in the Rooke Recital Hall and the Weis Center for the Performing Arts. The Kushell Music Endowment of Bucknell University enables the department to sponsor residencies by prominent musicians each year. Additionally, the music department and the Weis Center for the Performing Arts offer joint workshops and master classes each year.

Admissions & Auditions

Students seeking admission into any of the music degree programs audition virtually or in person before members of the department faculty. Additionally, applicants for the concentration in contemporary composition submit a portfolio of their work, and music education applicants complete an interview. The Department of Music's website contains additional information about the audition process, dates of auditions and scholarships. Prospective students must complete a Department of Music audition form and the Arts Merit Scholarship application form.

Regulations

Deviation from the established program of study for the major in music may be granted only by permission of the faculty adviser, the department chair and the dean of the College of Arts & Sciences.

Private instruction is offered in the following areas of performance: voice, piano, organ, woodwinds, brass, strings, guitar and percussion instruments, as well as improvisation.

Non-music majors are charged a fee for lessons. Contact the Department of Music for a fee schedule.

Non-music majors may receive one-quarter credit for participation in each recognized ensemble, with a maximum of one-half credit permitted per semester and a limit of two full course credits total. Music majors and minors audit ensembles rather than participate for credit because these credits do not count toward fulfilling the minimum degree requirements.

The department administers public showcases each semester for students to present performance, research, composition or some combination depending on the degree program. Music majors should contact the department for further information.

Music Majors

The University offers two degrees in music: the **Bachelor of Arts** and the **Bachelor of Music** in vocal performance and in music education. Regarding the Bachelor of Arts (BA) degree, students may pursue a concentration within the BA degree in Contemporary Composition, Cultural and Critical Studies in Music (CCSM) or Performance if they so wish. Requirements for the degree programs and concentrations within the BA are discussed below.

Requirements for All Majors

College of Arts & Sciences Core Curriculum (CASCC)

All students, regardless of degree program, must satisfy requirements of the College of Arts & Sciences Core Curriculum (CASCC). A description and components of the CASCC may be found elsewhere in this catalog. Bachelor of Music and Bachelor of Arts students will meet the three intellectual competency goals (writing, speaking and information literacy) within core coursework required for all degree programs. Culminating Experiences will be discussed within each degree program’s description below.

Ensembles

All music majors must participate in at least one Department of Music ensemble each semester. The only two exceptions to this policy are the semester in which a student is studying abroad or in which music education majors are student teaching. Music majors audit ensembles rather than take them for credit because the credits do not count toward fulfilling the minimum degree requirements. Auditions are required for Jazz Band, University Choir, Orchestra, Bucknell Voice Lab and Rooke Ringers (handbells).

Event Attendance

All students, regardless of degree program, must attend a minimum of 7 approved music events (e.g., performances, talks, and research presentations) each semester in order to satisfy degree requirements.

Department Showcase

All students, regardless of degree program, must participate in public department showcase each semester to present performance, research, composition, or some combination depending on the degree program.

Bachelor of Music

A candidate for the Bachelor of Music degree may choose from two curricula:

1. Vocal Performance
2. Music Education

A student wishing to change the degree program from a Bachelor of Arts in music to a Bachelor of Music may apply for admission to the Bachelor of Music program at the end of each semester through the sophomore year. The application must be made in writing to the chair of the Department of Music and involves the same process outlined for prospective students. Students are not accepted into the Bachelor of Music degree program after the sophomore year.

All Bachelor of Music students must pass a functional keyboard requirement (see description under MUSC 152 Functional Keyboard), fulfill the recital requirements specified in the respective degree programs, and participate in prescribed assessment activities such as exit interviews and exams.

Bachelor of Music in Vocal Performance

Candidates in vocal performance are reviewed at the end of each semester through an examination by a jury comprising faculty members of the Department of Music. At the end of the sophomore year, students must be approved for upper-level study by the department. Candidates whose progress is determined to be insufficient will not be permitted to continue in the Bachelor of Music degree program.

Students in the Bachelor of Music in Vocal Performance degree must demonstrate basic proficiency in Italian, French and German. Students enrolling in the University who have had at least the equivalent of one college semester of study in a language (one full year in secondary school) may petition the voice faculty to waive further study in that language during the degree process. Singers are encouraged to pursue as much language study as possible.

Culminating Experience

Vocal performance majors are expected to appear in several successful performances as soloist and in chamber ensembles prior to presenting a full public recital in the senior year as a Culminating Experience. The senior recital demonstrates a student's synthesis of theoretical and historical knowledge, technical skills, understanding of musical language and concepts, and musicality.

Degree Requirements

The Bachelor of Music in Vocal Performance requires 19 music credits.

Program Requirements		
MUSC 200	Diatonic Theory	1
MUSC 201	Chromatic Theory	1
MUSC 202	Advanced Theory	1
MUSC 249	Cross-Cultural Perspectives in Music (or another course in world music)	1
MUSC 252	Music and Culture: Chant to Beethoven	1
MUSC 253	Music and Culture: Beethoven to Virtual Music	1
MUSC 259	Conducting I	1
MUSC 340	Performance Seminar I	.5
MUSC 342	Repertoire and Pedagogy	.5
Electives		**5**
Two music electives [1]		
One elective in jazz theory or history		
One elective in 19th-century topics		
One elective in 20th-century topics		
Applied (Private Lessons)		**6**
Four semesters at .5 credit per semester (1st & 2nd year)		
Four semesters at 1 credit (3rd & 4th year)		
MUSC 152	Functional Keyboard	0
Total Credits		**19**

[1] MUSC 121, MUSC 122 and MUSC 123 may not be used to fulfill this requirement.

Other Requirements

Ensembles

Senior Recital

Recital Attendance Requirement (see Major Requirements comments above)

Bachelor of Music in Music Education

The curriculum in music education prepares students to teach music in the public schools. The curriculum is approved by the Pennsylvania Department of Education as a requirement for professional certification. Through this course of study, a student will be expected to develop:

1. Sound musicianship in an applied area,
2. Knowledge of music theory and the history of music, and
3. Broad cultural awareness through courses other than music.

Students may choose a curriculum that reflects either a vocal or instrumental emphasis; each emphasis is designed to fulfill at least the minimum requirements for preK-12 certification in the state of Pennsylvania. Candidates are reviewed at the end of each semester through an examination by a jury comprising members of the Department of Music faculty, and by an interview with the music education coordinator. At the end of the sophomore year, students must be approved for upper-level study by the department. Candidates whose progress is determined to be insufficient will not be permitted to continue in the bachelor of music degree program.

Music education students are expected to make several successful appearances as soloist and in chamber ensembles before the senior year, and to present during the fall of the senior year a minimum of half a solo recital in a chosen applied area. The student must also complete an e-portfolio in accordance with departmental guidelines. Additionally, all music education majors will take four semesters of lessons in secondary instruments: those students whose primary performance area is instrumental will study secondary instruments, voice students will study piano, and piano students will study voice.

Culminating Experience

The music education major will meet the Culminating Experience requirements (carrying 4 credits) through student teaching and the Student Teacher Seminar. Student teaching placements are assigned and supervised by the music education coordinator. During student teaching, music education majors will develop professional attitudes and human relationship skills, establish effective classroom climate and management skills, develop effective planning techniques, and demonstrate a command of subject-matter knowledge and materials. Criteria for grading have been established by the Bucknell University education department and are available through the Department of Music. Failure to achieve an appropriate grade in student teaching results in failure to receive state certification. It is not possible to place all student teachers at a partner school that is within walking distance of the Bucknell campus; students are responsible for providing their own transportation as needed.

Thirty-four full academic course credits are required for graduation, distributed as outlined below.

Degree Requirements

The Bachelor of Music in Music Education requires completion of the College of Arts & Sciences Core Curriculum in addition to 21 music credits.

Program Requirements		
MUSC 135	Introduction to Teaching Music	1
MUSC 142	String Methods	.25
MUSC 143	Woodwind Methods	.25
MUSC 144	Brass Methods	.25
MUSC 145	Percussion Methods	.25
MUSC 146	Voice Methods	.25
MUSC 200	Diatonic Theory	1
MUSC 201	Chromatic Theory	1
MUSC 202	Advanced Theory	1
MUSC 235	Principles of Teaching Music	1
MUSC 239	Choral Methods and Literature	1
or MUSC 241	Instrumental Methods and Literature	
MUSC 249	Cross-Cultural Perspectives in Music (or another course in world music)	1
MUSC 252	Music and Culture: Chant to Beethoven	1
MUSC 253	Music and Culture: Beethoven to Virtual Music	1
MUSC 259	Conducting I	1
MUSC 335	Student Teacher Seminar	1
MUSC 369	Conducting II	1
EDUC 102	Educational Psychology	1
EDUC 439	Student Teaching in Music	3
One music elective at or above the 200 level		1
Applied (Private Lessons)		**2.75**
Seven semesters at .25 credit per semester in primary instrument		

Four semesters at .25 credit in secondary instrument/voice		
MUSC 152	Functional Keyboard	0
Total Credits		**21**

Other Requirements

Ensembles

Senior Recital (at least a half recital)

Recital Attendance Requirement (see Major Requirements comments above)

Pennsylvania Department of Education Requirements for Certification

All music degree programs require students to complete the College of Arts & Sciences Core Curriculum. The certification requires:

MUSC 230	Music for Exceptional Children	1
EDUC 375	ESL Methods: Instruction and Assessment	1
Math courses [1]		2
Writing course [1]		1
English literature course [1]		1
PRAXIS exams and clearances (see music education coordinator for details)		

[1] These may be double-counted with CASCC requirements.

Bachelor of Arts with a Major in Music

Students pursuing the Bachelor of Arts in Music degree may elect to follow the requirements for the general BA, or they may elect to pursue a concentration within the confines of the Bachelor of Arts in Music degree. Concentrations include those in Cultural & Critical Studies in Music (CCSM), Contemporary Composition, and Performance.

Degree Requirements (without a concentration)

Comprises eight courses distributed as follows:

Program Requirements		
MUSC 200	Diatonic Theory	1
MUSC 201	Chromatic Theory	1
MUSC 202	Advanced Theory	1
MUSC 249	Cross-Cultural Perspectives in Music (or another course in world music)	1
MUSC 252	Music and Culture: Chant to Beethoven	1
MUSC 253	Music and Culture: Beethoven to Virtual Music	1
Electives		**2**
Two music electives [1]		
Applied (Private Lessons)		**2**
Eight semesters at .25 credit per semester (Note that when necessary, private lesson requirements are waived for the semester(s) during which a student studies abroad.)		
Total Credits		**10**

Other Requirements

Ensembles

Recital Attendance Requirement (see Major Requirements comments above)

Successful completion of performance juries

Bachelor of arts majors in music are expected to participate in at least one of the music department's vocal or instrumental performing organizations each semester in residence, to perform in studio classes or departmental recitals.

Culminating Experience

Students in the bachelor of arts degree (having no concentration) may choose from two options for meeting the Culminating Experience requirement:

- A full, public senior recital, or
- A research project done within an upper-level music course.

Students choosing a research project must receive permission from the instructor of the course in which they wish to fulfill the Culminating Experience.

Bachelor of Arts in Music with Concentration in Cultural & Critical Studies in Music

Cultural & Critical Studies in Music (CCSM) offers a concentration within the Bachelor of Arts in Music degree for students who wish to apply a variety of historical and analytical approaches to music study. In addition to pursuing traditional music instruction according to Western classical norms, CCSM equips students with the methodological tools to contextualize such study and to understand it as one system among many world traditions. These methodologies are drawn from the fields of ethnomusicology, musicology, critical theory, jazz studies, and cultural studies. Students will study notated, aural and improvised musical traditions, classical and popular music of various cultures, and will learn interdisciplinary research techniques that will assist in their work toward a final senior project on a topic of their choice. Each of the listed music and culture courses employs an interdisciplinary approach and encourages students to think across traditional academic boundaries as they pursue a degree in music.

Students who choose CCSM as their concentration take the following courses:

MUSC 200	Diatonic Theory	1
MUSC 201	Chromatic Theory	1
MUSC 202	Advanced Theory	1
MUSC 252	Music and Culture: Chant to Beethoven	1
MUSC 253	Music and Culture: Beethoven to Virtual Music	1
One credit in World Music, selected from the following list:		1
MUSC 249	Cross-Cultural Perspectives in Music	
MUSC 254	Music and Culture: Africa and the Diaspora	
One elective, selected from the following list:		1
MUSC 248	Music and Culture: Jazz and Social Justice	
MUSC 249	Cross-Cultural Perspectives in Music	
MUSC 254	Music and Culture: Africa and the Diaspora	
MUSC 257	Music and Culture: Jazz, Rock, and Race	
MUSC 258	Music and Culture: Music in American Life	
MUSC 350	Studies in Music	
MUSC 362	Music Projects: Selected Topics	1
Culminating Experience: Students pursuing the CCSM concentration complete a research paper written as part of the MUSC 362 course requirements.		
Applied (Private Lessons)		**2**
Eight semesters at .25 credit per semester (Note that when necessary, private lesson requirements are waived for the semester(s) during which a student studies abroad.)		
Total Credits		**10**

Other Requirements

Ensembles

Recital Attendance Requirement (see Major Requirements comments above)

Successful completion of performance juries

Total Number of Music Credits: 10

Bachelor of arts majors in the CCSM concentration are required to participate in at least one of the music department's vocal or instrumental performing organizations each semester in residence.

Bachelor of Arts in Music with Concentration in Contemporary Composition

The contemporary composition concentration of the Bachelor of Arts in Music degree allows students to engage in the study and practice of music composition and creation through the development of their creative compositional voices. Students will engage various perspectives of music composition while building a strong musical foundation based on the study of composition, music theory, instrumental performance, notational issues, music history and culture, and music technology. Students are encouraged to compose for a variety of acoustic and electro-acoustic media, and are expected to build a portfolio of composed works throughout their course of study with performance of their works occurring regularly.

The concentration in contemporary composition requires 10 credits specified as follows:

Select two of the following:		**2**
MUSC 200	Diatonic Theory	
MUSC 201	Chromatic Theory	
MUSC 203	Jazz Theory and Arranging	
Private composition lessons six semesters		1.5
MUSC 202	Advanced Theory	1
MUSC 232	Music Technology	.5
MUSC 249	Cross-Cultural Perspectives in Music	1
MUSC 252	Music and Culture: Chant to Beethoven	1
MUSC 253	Music and Culture: Beethoven to Virtual Music	1
MUSC 362	Music Projects: Selected Topics	1
Applied Music (Private lessons in major performance area): four semesters at .25 credit per semester.		1
MUSC 152	Functional Keyboard	0
Total Credits		**10**

Other Requirements:

Ensembles

Senior Composition Recital

Recital Attendance Requirement (see Major Requirements comments above)

Culminating Experience

Students pursuing the contemporary composition concentration are required to present a recital comprising students' compositions.

Total Number of Music Credits: 10

Bachelor of Arts in Music with Concentration in Performance

The Bachelor of Arts with a Concentration in Performance degree allows students to develop strong performance skills through the practice and study of musicianship and technique. Students explore a variety of musical styles along with performance practice and healthy body use. Students are expected to build a strong musical foundation through the study of music theory and history. Performance concentration students receive an hour-long lesson weekly each semester they are in residence and are required to perform each semester in department recitals. Performance concentration students must present a full recital during their senior year. Vocalists may choose either the BM performance degree or the BA performance concentration depending upon their own goals as well as the outcome of the audition process.

The concentration in performance requires 10 credits specified as follows:

Music Theory		**3**
MUSC 200	Diatonic Theory	
MUSC 201	Chromatic Theory	
MUSC 202	Advanced Theory	
or MUSC 203	Jazz Theory and Arranging	
Music History		**2**
MUSC 252	Music and Culture: Chant to Beethoven	
MUSC 253	Music and Culture: Beethoven to Virtual Music	
World Music		**1**
Select one course from the following:		
MUSC 249	Cross-Cultural Perspectives in Music	
MUSC 254	Music and Culture: Africa and the Diaspora	
Seminar		**1**
MUSC 362	Music Projects: Selected Topics	
Two Performance Studies Courses [2]		**1**
MUSC 340	Performance Seminar I	
& MUSC 342	and Repertoire and Pedagogy	
Hour lessons on the major instrument: eight semesters (.25 credit each)		2

MUSC 152	Functional Keyboard	0
Total Credits		**10**

Other Requirements:

A minimum of one recital performance each semester

Full senior recital

Participation in a department ensemble each semester

Recital Attendance

Culminating Experience

Students pursuing the performance concentration complete a senior recital demonstrating a synthesis of theoretical and historical knowledge, technical skills, understanding of musical language and concepts, and musicality.

1 MUSC 121, MUSC 122 and MUSC 123 may not be used to fulfill this requirement.

2 MUSC 342 Repertoire and Pedagogy requirement may be fulfilled by taking the class proper, or by successfully completing four semesters of studio class as determined by the student's applied music instructor. In the latter case, the student enrolls in MUSC 342 during the fourth semester of studio class.

Minor in Music

Minor Requirements

The minor in music consists of six course credits as outlined below. A minimum of two credits must be above the 100 level.

Program Requirements		
MUSC 200 & MUSC 201	Diatonic Theory and Chromatic Theory [1]	2
MUSC 252	Music and Culture: Chant to Beethoven	1
or MUSC 253	Music and Culture: Beethoven to Virtual Music	
MUSC 249 or a course at the 200 or 300 level in music and culture		1
Elective [2]		1
Applied (Private Lessons)		**1**
Four semesters at .25 per semester		
Total Credits		**6**

1 Students lacking sufficient music theory background to begin the theory sequence with MUSC 200 Diatonic Theory should enroll in MUSC 121 Fundamentals of Music Theory or pursue an individualized course of instruction on their own before enrolling in MUSC 200 Diatonic Theory.

2 MUSC 121 Fundamentals of Music Theory, MUSC 122 Introduction to Western Music, MUSC 123 Introduction to Music and MUSC 260 Ensemble may not be used to fulfill this requirement.

As with the music major, credits received from participation in ensembles will not count toward the minimum requirements for the minor.

Department of Music Learning Goals

1. Students will demonstrate the ability to engage in appropriate performance practice in solo/chamber/ensemble music across a varied section of repertoire in their major performance area.
2. Students will demonstrate knowledge of historical, cultural and stylistic musical traditions through the present time.
3. Students will demonstrate knowledge of musical forms, processes and structures in compositional, performance, analytical, scholarly and pedagogical applications.

Courses

MUSC 110. Introduction to Singing: Who, What and How?. .5 Credits.
Offered Occasionally; Lecture hours:1.5
This course is intended for any student who would like to learn how to sing. Students will learn the basics of vocal technique and be equipped with practical skills to improve their own singing.

MUSC 114. Composition Studio Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Analytical and creative study of contemporary musical composition. Prerequisite: permission of the instructor.

MUSC 120. Music-Making for Beginners. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores musical processes including performance, improvisation, and composition. Students will learn how to play an instrument (including guitar, ukulele, classroom instruments, drum set, and/or piano) and write original music (with instruments and/or relevant software, like GarageBand). Not open to music majors.

MUSC 121. Fundamentals of Music Theory. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:1
The study of the fundamentals of music, including standard staff notation, simple and compound meter, spelling triads, and simple harmonic progressions. The skills in this course are required for MUSC 200. Does not fulfill any requirement for the music major or music minor.

MUSC 122. Introduction to Western Music. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of various types of western music in cultural and historical context; topics range from classical to jazz, American popular music, and the avant-garde. Students may not take both MUSC 122 and MUSC 123. Does not fulfill any requirement for the music major or music minor.

MUSC 123. Introduction to Music. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examination of music's basic characteristics (rhythm, timbre, etc.) and processes (improvisation, performance, composition, etc.). Musics studied may include traditional, classical, contemporary, and popular styles from around the world, including the United States. Students may not take both MUSC122 and MUSC123. Does not fulfill any requirement for the music major/music minor.

MUSC 125. Introduction to Jazz. 1 Credit.
Offered Occasionally; Lecture hours:3
The course will examine the origins, development, and diverse styles of jazz, including study of artists, movements, and technologies that have shaped and continue to influence the history of jazz.

MUSC 126. Introduction to Popular Music in the U.S.. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of principal style periods in American popular music from ca. 1840 to the present.

MUSC 127. Introduction to Rock Music. 1 Credit.
Offered Occasionally; Lecture hours:3
A survey of rock music's history, development and culture. Includes exploration of changes in the music industry and the roll of technology in shaping rock music styles.

MUSC 135. Introduction to Teaching Music. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course provides basic foundations in the discipline of music teaching, learning, and pedagogy to students within the context of music education in the United States. Intended for students in the B.Mus. (Music Education, Vocal Performance) and B.A. (Music) majors.

MUSC 142. String Methods. .25 Credits.
Offered Alternating Fall Semester; Lecture hours:Varies,Other:2
An introductory course in string instruments. Intended for Bachelor of Music and Music Education students.

MUSC 143. Woodwind Methods. .25 Credits.
Offered Alternating Spring Semester; Lecture hours:Varies,Other:2
An introductory course in woodwind instruments. Intended for Bachelor of Music and Music Education students.

MUSC 144. Brass Methods. .25 Credits.
Offered Alternating Fall Semester; Lecture hours:Varies,Other:2
An introductory course in brass instruments. Intended for Bachelor of Music and Music Education students.

MUSC 145. Percussion Methods. .25 Credits.
Offered Alternating Spring Semester; Lecture hours:Varies,Other:2
An introductory course in percussion instruments. Intended for Bachelor of Music and Music Education students.

MUSC 146. Voice Methods. .25 Credits.
Offered Alternating Spring Semester; Lecture hours:Varies,Other:2
An introductory course in voice pedagogy. Intended for Bachelor of Music and Music Education students.

MUSC 152. Functional Keyboard. 0 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:2; Repeatable
A requirement for MUED, MUVP, BAPF, and BACC majors. Functional keyboard skills including harmonization, transposition, and improvisation. Students will register for the course each semester until it is completed successfully. Failure to complete the requirement will prevent a student from continuing in the degree program.

MUSC 160. Process over Product: Voice Lesson Studio Class. .25 Credits.
Offered Occasionally; Lecture hours:.5,Other:.5; Repeatable
A group class to cover additional material that will enhance the information in your applied voice studio. This course is for all BA, BAPF, BM and MuED voice majors in addition to voice lessons. Corequisite for MUSC 172, MUSC 272 or MUSC 372. Prerequisite: permission of the instructor.

MUSC 170. Piano Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual piano lessons. Prerequisite: permission of the instructor.

MUSC 171. Organ Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual organ lessons. Prerequisite: permission of the instructor.

MUSC 172. Voice Lessons I. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Common Hour:1; Repeatable
Individual voice lessons. Prerequisite: permission of the instructor.

MUSC 174. Violin Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual violin lessons. Prerequisite: permission of the instructor.

MUSC 175. Viola Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual viola lessons. Prerequisite: permission of the instructor.

MUSC 176. Violoncello Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual violoncello lessons. Prerequisite: permission of the instructor.

MUSC 178. String Bass Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual string bass lessons. Prerequisite: permission of the instructor.

MUSC 179. Flute Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual flute lessons. Prerequisite: permission of the instructor.

MUSC 181. Clarinet Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual clarinet lessons. Prerequisite: permission of the instructor.

MUSC 183. Oboe Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual oboe lessons. Prerequisite: permission of the instructor.

MUSC 185. Bassoon Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual bassoon lessons. Prerequisite: permission of the instructor.

MUSC 187. Saxophone Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual saxophone lessons. Prerequisite: permission of the instructor.

MUSC 188. Balinese Gamelan Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual lessons in advanced techniques for Balinese music. Students may study gender wayang, reyong, kendang, and/or suling. Prerequisite: permission of the instructor.

MUSC 189. Trumpet Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual cornet/trumpet lessons. Prerequisite: permission of the instructor.

MUSC 190. Contemporary Voice Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:1; Repeatable
Private study focusing on contemporary and extended vocal techniques.

MUSC 191. French Horn Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual French horn lessons. Prerequisite: permission of the instructor.

MUSC 192. Trombone Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual trombone lessons. Prerequisite: permission of the instructor.

MUSC 193. Tuba Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual tuba lessons. Prerequisite: permission of the instructor.

MUSC 194. Euphonium Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual baritone horn lessons. Prerequisite: permission of the instructor.

MUSC 196. Guitar Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual guitar lessons. Prerequisite: permission of the instructor.

MUSC 197. Percussion Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual percussion lessons. Prerequisite: permission of the instructor.

MUSC 198. Harp Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual harp lessons. Prerequisite: permission of the instructor.

MUSC 199. Improvisation Lessons I. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual lessons in improvisation. Prerequisite: permission of the instructor.

MUSC 1NT. Music Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3; Repeatable
Non-traditional course in music. Prerequisite: permission of the instructor.

MUSC 200. Diatonic Theory. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:1
Study of diatonic triads and dominant seventh chords, progressions, cadences, secondary dominants, diatonic modulation, musical forms, orchestration, and score reading. This course is open to students who have successfully completed MUSC 121 (Fundamentals of Music Theory) or who have demonstrated requisite knowledge on the department's Theory Placement Assessment.

MUSC 201. Chromatic Theory. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:1
Chromatic harmony, modulations, a study of basic classical and romantic forms. Includes ear training, keyboard harmony, and sight singing. Prerequisite: MUSC 200.

MUSC 202. Advanced Theory. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:1
An in-depth study of major compositional techniques from approximately 1910 to the present. Class requires advanced knowledge of the Sibelius notation program. Prerequisite: MUSC 200 or MUSC 201.

MUSC 203. Jazz Theory and Arranging. 1 Credit.
Offered Occasionally; Lecture hours:3
Study of the language of improvisation and analysis of techniques used by composers and arrangers throughout jazz history. Emphasis placed on original creative work and music in the style of historically important figures. Prerequisite: MUSC 200 or permission of the instructor. Crosslisted as MUSC 603.

MUSC 207. Global Pop and Global Warming. 1 Credit.
Offered Occasionally; Lecture hours:3
Examining the interplay of social and environmental issues in various forms of traditional and popular music, this class asks: what can we learn by attending to music making at a time that increasingly feels like the end of the world?.

MUSC 208. The World of Musical Instruments. 1 Credit.
Offered Occasionally; Lecture hours:3
What can musical instruments teach us about philosophies of technology, traditional cultural practices and issues of race, gender, class and environment? This course investigates Bucknell’s collection of rare instruments as more than mere tools, yielding insights into ethical, musical, cultural and philosophical issues related to these important items.

MUSC 209. Composition I. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Analytical and creative study of contemporary musical composition. Prerequisite: permission of the instructor.

MUSC 210. Composition II. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Analytical and creative study of contemporary musical composition. Prerequisite: permission of the instructor.

MUSC 214. Composition Studio Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Analytical and creative study of contemporary musical composition. Prerequisite: permission of the instructor.

MUSC 215. Philosophy of Music. 1 Credit.
Offered Occasionally; Lecture hours:3
What is music—sound waves? live performances? streaming audio code? a conductor's score? Is music a language—does it have meaning or emotions? Who decides: the listener or composer? Are associations with specific sounds—say, a siren—cultural? physiological? Creativity and analysis from brilliant modern philosophers helps us explore! Crosslisted as PHIL 215.

MUSC 216. Computer Music Programming. 1 Credit.
Offered Occasionally; Lecture hours:3
An introduction to the design and development of music software. Students will develop music generating, processing, and compositional tools using contemporary programming language.

MUSC 217. Audio Mixing and Production. 1 Credit.
Offered Occasionally; Lecture hours:3
The course explores the art, processes, and techniques used in the mixing and production of popular music through focused study and firsthand practice and creation. The goal of the course is to help students gain the artistic and technical skills necessary to create and produce recorded music.

MUSC 218. Music Poetry of the Art Song. .5 Credits.
Offered Occasionally; Lecture hours:2
An Art Song Literature course that covers an introductory survey of representative art song vocal repertoire of Germany, France, Italy, the British Isles and the United States. This course will require performance, either by piano or voice, of the literature covered. Prerequisite: music department only. Not open to first-year students.

MUSC 220. Performance for Laptop. .5 Credits.
Offered Occasionally; Lecture hours:1,Other:1; Repeatable
Students will explore the laptop as a performing instrument and will be immersed in the performance and practice of "classical," contemporary, and improvisatory electro-acoustic music.

MUSC 221. Music for Film, Games, and Media. 1 Credit.
Offered Occasionally; Lecture hours:3
The course explores the artistic tools and techniques used to compose for film, video games, and other media. Students will create music for visual media primarily through technologies used throughout the media scoring industry. The course is open to students of all levels.

MUSC 230. Music for Exceptional Children. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
This course prepares prospective teachers for teaching students with diverse needs through the exploration of the ways in which curriculum, instruction, and assessment may be adapted.

MUSC 231. English Language Learners for Music Educators. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
This course prepares prospective teachers to effectively engage English Language Learners through the exploration of various concepts, tools, and methods for modifying content for successful student learning. EDUC 375 may be substituted for this course.

MUSC 232. Music Technology. .5 Credits.
Offered Occasionally; Lecture hours:1.5
A survey of music technology. Topics include recording technology, digital audio, spectral analysis and synthesis, MIDI/OSC, sequencing, sampling, computer music languages, and synthesis techniques.

MUSC 235. Principles of Teaching Music. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
In this course, music education majors develop knowledge and skills necessary for successful pre-K-12 music teaching within the context of music education in the United States. Topics include curricular design, philosophical foundations, assessment strategies, and various methodologies. Prerequisite: MUSC 135.

MUSC 239. Choral Methods and Literature. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3,Other:2
Intended for music education majors having a choral emphasis. Elementary and secondary school choral methods and materials. Program pedagogy and administration.

MUSC 241. Instrumental Methods and Literature. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3,Other:2
Intended for music education majors having an instrumental emphasis. Orchestral, concert, marching, and jazz band repertoire. Elementary and secondary school methods and materials. Program administration.

MUSC 248. Music and Culture: Jazz and Social Justice. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
A critical examination of musicians, movements, and cultural intersections within the development of jazz. Crosslisted as CBST 248.

MUSC 249. Cross-Cultural Perspectives in Music. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
An introduction to the study of music in cross-cultural perspective. Examines various musics' sounds, contexts, and meanings through several intersecting themes: identity, ritual, dance, etc.

MUSC 252. Music and Culture: Chant to Beethoven. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
A survey of western European art music from Gregorian chant to Beethoven.

MUSC 253. Music and Culture: Beethoven to Virtual Music. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
A survey of western European art music from the early 19th century to the present. When possible, MUSC 252 should be taken before enrolling in MUSC 253.

MUSC 254. Music and Culture: Africa and the Diaspora. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Explores music-making practices in selected parts of Africa, South America, the Caribbean, and North America. Examines relationship between musical styles, creative processes, and cultural contexts.

MUSC 256. Music and Culture: Popular Music. 1 Credit.
Offered Occasionally; Lecture hours:3
A study of popular music in selected national and historical settings.

MUSC 257. Music and Culture: Jazz, Rock, and Race. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A thorough examination of historically important musicians and movements within the context of race and culture. Crosslisted as CBST 257.

MUSC 258. Music and Culture: Music in American Life. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of music and identity formation among various cultural and religious groups in selected periods of United States history.

MUSC 259. Conducting I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Standard beat patterns, basic conducting problems, analysis of instrumental and choral scores. Prerequisite: MUSC 200.

MUSC 260. Ensemble. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
Non music majors may receive .25 credit per ensemble (maximum of .5 credit per semester, limit of two full-course credits in all). Music majors audit ensembles. Audition or permission of the instructor may be required for first-time members. 01-Symphonic Band, 02-Orchestra, 03-University Choir, 05-Voice Lab, 06-Handbells, 07-Jazz Band, 08-Gamelan.

MUSC 266. Musical Transmission: From Preservation to Appropriation. 1 Credit.
Offered Occasionally; Lecture hours:3
An examination of the processes through which musical repertoire is transmitted between people, generations, and/or cultures. Assessing the challenges and opportunities of musical transmission in the contemporary context of globalization, topics range from oral traditions to the impact of the recording industry, from documentation/repatriation of endangered traditions to digital sampling.

MUSC 270. Piano Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual piano lessons. Prerequisite: permission of the instructor.

MUSC 271. Organ Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual organ lessons. Prerequisite: permission of the instructor.

MUSC 272. Voice Lessons II. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Common Hour:1; Repeatable
Individual voice lessons. Prerequisite: permission of the instructor.

MUSC 274. Violin Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual violin lessons. Prerequisite: permission of the instructor.

MUSC 275. Viola Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual viola lessons. Prerequisite: permission of the instructor.

MUSC 276. Violoncello Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual cello lessons. Prerequisite: permission of the instructor.

MUSC 278. String Bass Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual string bass lessons. Prerequisite: permission of the instructor.

MUSC 279. Flute Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual flute lessons. Prerequisite: permission of the instructor.

MUSC 280. Jazz Improvisation. 1 Credit.
Offered Occasionally; Lecture hours:3
An exploration of improvised jazz including the elements of harmony, form and styles. Students will perform in class. No prior jazz experience necessary.

MUSC 281. Clarinet Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual clarinet lessons. Prerequisite: permission of the instructor.

MUSC 283. Oboe Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual oboe lessons. Prerequisite: permission of the instructor.

MUSC 285. Bassoon Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual bassoon lessons. Prerequisite: permission of the instructor.

MUSC 287. Saxophone Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual saxophone lessons. Prerequisite: permission of the instructor.

MUSC 288. Balinese Gamelan Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual lessons in advanced techniques for Balinese music. Students may study gender wayang, reyong, kendang, and/or suling. Prerequisite: permission of the instructor.

MUSC 289. Trumpet Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual cornet/trumpet lessons. Prerequisite: permission of the instructor.

MUSC 290. Contemporary Voice Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:1; Repeatable
Private study focusing on contemporary and extended vocal techniques. Level 2.

MUSC 291. French Horn Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual french horn lessons. Prerequisite: permission of the instructor.

MUSC 292. Trombone Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual trombone lessons. Prerequisite: permission of the instructor.

MUSC 293. Tuba Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual tuba lessons. Prerequisite: permission of the instructor.

MUSC 294. Euphonium Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual baritone horn lessons. Prerequisite: permission of the instructor.

MUSC 296. Guitar Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual guitar lessons. Prerequisite: permission of the instructor.

MUSC 297. Percussion Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual percussion lessons. Prerequisite: permission of the instructor.

MUSC 298. Harp Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual harp lessons. Prerequisite: permission of the instructor.

MUSC 299. Improvisation Lessons II. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual lessons in improvisation.

MUSC 2NT. Music Non-traditional Study. 1 Credit.
Offered Occasionally; Lecture hours:Varies,Other:3; Repeatable
Non-traditional study in music; may include but not limited to internships on or off campus. Prerequisite: permission of the instructor.

MUSC 300. Solo Vocal Diction. .25 Credits.
Offered Occasionally; Lecture hours:1
Diction course that covers an introductory survey of representative vocal art song repertoire of Germany, France, Italy, the British Isles and the United States concurrent with learning the International Phonetic Alphabet and how to apply it to a variety of languages.

MUSC 314. Composition Studio Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Analytical and creative study of contemporary musical composition. Prerequisite: permission of the instructor.

MUSC 322. Music and Social Justice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores music that has been created to advance the goals of social justice movements in various cultures and time periods. Prerequisite: permission of the instructor.

MUSC 335. Student Teacher Seminar. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course provides student teachers in music with the opportunity to refine their teaching practices through guided reflection, discussion, reading, writing, and various other activities. Corequisite: EDUC 439. Prerequisite: MUSC 235.

MUSC 340. Performance Seminar I. .5 Credits.
Offered Occasionally; Lecture hours:Varies,Other:1.5; Repeatable
Covers performance-related issues including collaboration, memorization, performance anxiety, wellness, and music cognition. Students will be able to perform in master classes with visiting artists. Open to music majors; others by permission.

MUSC 342. Repertoire and Pedagogy. .5 Credits.
Offered Occasionally; Lecture hours:2
Examines a wide range of repertoire and pedagogical approaches as one element of the holistic training for students studying music and performance. Open to music majors; others by permission.

MUSC 350. Studies in Music. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Special projects (typically independent studies) undertaken with the approval of a Music faculty member and the Department Chair.

MUSC 351. Topics in Music History: pre-ca. 1800. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Advanced critical study of repertoires, performance practices, performers, composers, and patrons from selected musical cultures and style periods prior to ca. 1800. May be repeated for credit when topics differ.

MUSC 352. Topics in Music: ca. 1800-1900. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Advanced studies in topics pertaining to performance and literature, theory and analysis, or forms and genres of the 19th century. May be repeated for credit when topics differ.

MUSC 353. Topics in Music: ca. 1900-present. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Advanced studies in topics pertaining to performance and literature, theory and analysis, composition and technology, or forms and genres of the 20th or 21st centuries. May be repeated for credit when topics differ.

MUSC 355. Introduction to Spanish and Latin American Art Song. 1 Credit.
Offered Occasionally; Lecture hours:3
Introduction and survey of art song literature for solo voice and piano/guitar from Spain and Latin America from the Baroque through 21st century with an emphasis on poetic settings, style, and the genre's place within the Western art song canon. Course includes in-class performances.

MUSC 362. Music Projects: Selected Topics. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3; Repeatable
A W2 course designed to facilitate intensive research and writing on a music topic of the student's choice. Prerequisites: one MUSC course and topic for research project and permission of the instructor.

MUSC 369. Conducting II. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Advanced baton technique, rehearsal methods, and score analysis. Prerequisites: MUSC 259 or permission of the instructor.

MUSC 370. Piano Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual piano lessons. Prerequisite: permission of the instructor.

MUSC 371. Organ Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual organ lessons. Prerequisite: permission of the instructor.

MUSC 372. Voice Lessons III. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Common Hour:1; Repeatable
Individual voice lessons. Prerequisite: permission of the instructor.

MUSC 374. Violin Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual violin lessons. Prerequisite: permission of the instructor.

MUSC 375. Viola Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual viola lessons. Prerequisite: permission of the instructor.

MUSC 376. Violoncello Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual cello lessons. Prerequisite: permission of the instructor.

MUSC 378. String Bass Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual string bass lessons. Prerequisite: permission of the instructor.

MUSC 379. Flute Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual flute lessons. Prerequisite: permission of the instructor.

MUSC 381. Clarinet Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual clarinet lessons. Prerequisite: permission of the instructor.

MUSC 383. Oboe Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual oboe lessons. Prerequisite: permission of the instructor.

MUSC 385. Bassoon Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual bassoon lessons. Prerequisite: permission of the instructor.

MUSC 387. Saxophone Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual saxophone lessons. Prerequisite: permission of the instructor.

MUSC 388. Balinese Gamelan Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual lessons in advanced techniques for Balinese music. Students may study gender wayang, reyong, kendang, and/or suling. Prerequisite: permission of the instructor.

MUSC 389. Trumpet Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual cornet/trumpet lessons. Prerequisite: permission of the instructor.

MUSC 390. Contemporary Voice Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:1; Repeatable
Private study focusing on contemporary and extended vocal techniques. Level 3.

MUSC 391. French Horn Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual French horn lessons. Prerequisite: permission of the instructor.

MUSC 392. Trombone Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual trombone lessons. Prerequisite: permission of the instructor.

MUSC 393. Tuba Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual tuba lessons. Prerequisite: permission of the instructor.

MUSC 394. Euphonium Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Individual baritone horn lessons. Prerequisite: permission of the instructor.

MUSC 396. Guitar Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual guitar lessons. Prerequisite: permission of the instructor.

MUSC 397. Percussion Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual percussion lessons. Prerequisite: permission of the instructor.

MUSC 398. Harp Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Individual harp lessons. Prerequisite: permission of the instructor.

MUSC 399. Improvisation Lessons III. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Studio lessons in improvisation.

MUSC 3NT. Music Non-traditional Study. 1 Credit.
Offered Occasionally; Lecture hours:Varies,Other:3; Repeatable
Non-traditional course in music.

Neuroscience

Faculty

Director: Elizabeth A. Capaldi

Affiliated Faculty: Elizabeth A. Capaldi, Matthew Q. Clark, David W. Evans, Judith E. Grisel, Andrea R. Halpern, Heidi Lorimor, Aaron Mitchel, Kevin P. Myers, Jennifer Rice Stevenson, T. Joel Wade

How does the nervous system interact with the ways that human and non-human animals think, feel, communicate, develop and behave? This is a core question that brings together a diverse faculty of active scholars at Bucknell who teach courses across the neuroscience curriculum and conduct high-quality research with students. Neuroscience is an interdisciplinary major with course offerings from biology, psychology, animal behavior, linguistics, chemistry, mathematics, physics and biomedical engineering. The neuroscience major is intended to give students opportunities through coursework and research experiences to study the nervous system and its development and influence on behavior (broadly defined). Our faculty are productive scholars who involve students in their research programs; we view research experience as a key aspect to the learning process.

The neuroscience major is offered within the bachelor of science degree program. All students are strongly encouraged to identify a faculty mentor and join them in conducting research as volunteers or as mentored, independent research students. Faculty interests vary in terms of topics, model systems and research methods: our research facilities include cell and molecular wet labs, tools for studying brain activity and perceptual processes, behavior labs for studying behavior and development in vertebrates (e.g., rats, fish, turtles, mice, prairie voles, bats) and invertebrates (e.g., flies, honeybees). We also have facilities for studying human vision, addiction, cognition, language, hormones, and how the brain remembers and processes music. Students who succeed in neuroscience will be well-equipped to go on to graduate study in neuroscience, biology, psychology or medicine, as well as to work in a variety of disciplines, including careers relating to biotechnology, pharmaceuticals or medical instrumentation.

Bachelor of Science in Neuroscience

The **Bachelor of Science major** in neuroscience requires 18 courses. Introductory and intermediate courses are in several thematic clusters, including foundations in psychology and biology, behavioral and cognitive sciences, quantitative analysis, and allied lab sciences. Four advanced electives are chosen from a specified list of advanced neuroscience courses that build on this foundation. The Culminating Experience is designed to provide students with research experiences.

Program Requirements

Foundations		**4**
BIOL 201	Biological Inquiries and Observations	
BIOL 203	Integrated Concepts in Biology Fall	
BIOL 204	Integrated Concepts in Biology Spring	
PSYC 100	Introduction to Psychology	
Neuroscience Core		**2**

NEUR 253	Cellular and Molecular Neurobiology	
NEUR 254	Behavioral Neuroscience	
Behavioral & Cognitive Sciences		**2**
Select two of the following:		
LING 230	Psycholinguistics	
LING/PSYC 237	Introduction to Language Development	
PSYC 203	Learning	
PSYC 204	Human Cognition	
PSYC/NEUR 217	Psychopharmacology	
PSYC/NEUR 248	Developmental Psychobiology	
PSYC 252	Sensation and Perception	
Quantitative		**2**
MATH 201	Calculus I	
MATH 216	Statistics I	
or PSYC 215	Psychological Statistics	
Cognate Lab Sciences		**4**
CHEM 205 & CHEM 211	Principles of Chemistry and Organic Chemistry I	
PHYS 211 & PHYS 212	Classical and Modern Physics I and Classical and Modern Physics II	
Advanced Neuroscience Electives		**4**
Choose four advanced electives. [1,2]		
NEUR/PSYC 305	Neurodevelopmental Disorders	
NEUR 310/PSYC 341	Neurophysiology of Wellbeing	
NEUR/PSYC 312	Biopsychology of Appetite and Obesity	
NEUR/PSYC 313	Researching Behavioral Neuroscience	
NEUR/PSYC 321	Neuroethics	
NEUR/BIOL 332	Developmental Neurobiology	
NEUR/PSYC 344	Developmental Brain Research	
NEUR 360	Honors Thesis	
NEUR/PSYC 368	Social Neuroscience	
NEUR 399	Undergraduate Research	
BIOL 318	Principles of Physiology	
BIOL 328	Endocrinology	
BIOL 329	Foundations of Genetics	
BIOL/ANBE 342	Neuroethology	
BMEG 441	Neural Engineering	
CHEM 351	Biochemistry I	
LING 325	Language and the Brain	
LING 330	Advanced Topics in Psycholinguistics	
PSYC 286	Advanced Methods Developmental Psychobiology	
PSYC 290	Advanced Methods in Biopsychology	
PSYC 292	Advanced Methods in Sensation and Perception	
PSYC 293	Advanced Methods in Learning	
PSYC 294	Advanced Methods in Human Cognition	
PSYC 318	Cognitive Aging	
PSYC 324	Advanced Psychological Statistics	
PSYC 339	Psychology of Music	
PSYC 349	Cognitive Neuroscience	
PSYC 352	Face Perception	

[1] No more than one of the 200-level Psychology Research Methods courses (PSYC 286, PSYC 290, PSYC 292, PSYC 293, PSYC 294) may count toward the four advanced electives.

[2] Students are encouraged to become involved in independent research. However, no more than one credit for research experience (NEUR 399 Undergraduate Research or NEUR 360 Honors Thesis) may count toward the four advanced courses required for the major.

Students with interest in particular aspects of the field of neuroscience are encouraged to consult with program faculty and their academic adviser to select courses that match their interests and goals, as there are no predetermined tracks within the major.

The recommended sequence for the neuroscience bachelor of science major is as follows:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
PSYC 100[1]	1	BIOL 201	1
CHEM 205	1	CHEM 211	1
		MATH 201	1
	2		**3**
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
NEUR 253	1	NEUR 254	1
BIOL 203	1	BIOL 204	1
MATH 216	1	Behavioral/Cognitive Sciences Cluster[2]	1
	3		**3**
Junior			
First Semester	**Credits**	**Second Semester**	**Credits**
Advanced Neuroscience elective[4]	1	Advanced Neuroscience elective[4]	1
PHYS 211[3]	1	PHYS 212	1
Behavioral/Cognitive Science Cluster [2]	1		
	3		**2**
Senior			
First Semester	**Credits**	**Second Semester**	**Credits**
Advanced Neuroscience elective[4]	1	Advanced Neuroscience elective[4]	1
NEUR 400[5]	0	NEUR 400[5]	0
	1		**1**

Total Credits: 18

[1] Students entering with AP credit for PSYC 100 may opt to take MATH 201 in the first semester or may take an additional course in the first semester for the College of Arts & Sciences Core Curriculum.

[2] See the above list of courses that count in the Behavioral/Cognitive Sciences cluster.

[3] Students who wish to study abroad either semester of their junior year should consult with their academic adviser regarding options for timing of the PHYS 211-PHYS 212 sequence.

[4] See the above list of courses that count as advanced neuroscience electives.

[5] All students will take NEUR 400 in either fall or spring semester of their senior year.

Writing in the Major

Neuroscience students will satisfy the requirement of writing in the major by completing BIOL 203 Integrated Concepts in Biology Fall and BIOL 204 Integrated Concepts in Biology Spring. These foundational courses include direct instruction in writing skills and assigned readings from a text on scientific writing. Students complete multiple drafts of scientific lab reports using feedback on preliminary drafts and have opportunities to discuss their writing during the revision process. Students may further develop writing skills in the discipline by selecting advanced courses that include additional writing instruction. All of the advanced electives, PSYC 286 Advanced Methods Developmental Psychobiology, PSYC 290 Advanced Methods in Biopsychology, PSYC 292 Advanced Methods in Sensation and Perception, PSYC 293 Advanced Methods in Learning and PSYC 294 Advanced Methods in Human Cognition, include a focus on writing scientific reports and most of the 300-level courses include a substantial writing component.

Study Abroad

Students are encouraged to study abroad in conjunction with the major or to explore interests outside the major, or both. Students who are considering studying abroad should consult with their academic adviser early to determine the ideal timing. With sufficient advance planning, rearrangement of the suggested course sequence can enable study abroad in either semester of the junior year or the first semester of the senior year.

Formal Presentation Experience

Students in the NEUR major will satisfy the formal presentation requirement by completing NEUR 253 Cellular and Molecular Neurobiology. Other courses in the major offer further instruction and assessment of formal presentations or leading discussions. Students who are interested in gaining further instruction on presentations might consider taking one or some of the following courses:

ANBE/BIOL 342	Neuroethology	1
LING 230	Psycholinguistics	1
LING 325	Language and the Brain	1
NEUR/PSYC 248	Developmental Psychobiology	1
NEUR/PSYC 305	Neurodevelopmental Disorders	1
NEUR/PSYC 312	Biopsychology of Appetite and Obesity	1
PSYC 318	Cognitive Aging	1
PSYC 339	Psychology of Music	1
PSYC 349	Cognitive Neuroscience	1
PSYC 352	Face Perception	1

Information Literacy

Neuroscience students will satisfy their information literacy requirement by completing BIOL 203 Integrated Concepts in Biology Fall and NEUR 253 Cellular and Molecular Neurobiology. Students may also satisfy their information literacy requirement by completing independent research for credit (NEUR 399 Undergraduate Research or NEUR 360 Honors Thesis). In all these experiences, students receive direct instruction on gathering and assimilation of scientific literature through a variety of search mechanisms, including, for example, PubMed, Web of Science, and PSYCinfo.

Culminating Experience

The Culminating Experience in the neuroscience major has two components. Both will be completed by all students in the major.

1. ***Engaging in original scientific investigation*** through direct practice in the process of scientific discovery either through independent research or in an advanced course. This portion may be satisfied by one of the options listed here:
   a. *Complete a supervised research project in neuroscience or a closely related topic*. The research experience can be at Bucknell or elsewhere as long as it is supervised by someone with relevant scholarly expertise. The research may be conducted during the academic year or summer, and may be for course credit or not, as long as it satisfies these criteria set forth by the faculty: an empirical project in which the student collects and analyzes original data to test a hypothesis, and a written report or other scholarly presentation that connects the results to the existing scholarly literature. Each year, the neuroscience program director will survey students' involvement in such projects. Students planning to complete this component away from Bucknell should consult the program director to ensure their project satisfies the requirements.
   b. *Complete an advanced course that includes a research component.* As one of the four advanced neuroscience electives, one course must include substantial experience with collecting and analyzing original data and interpreting and reporting the results. These courses include: PSYC 286 Advanced Methods Developmental Psychobiology, PSYC 290 Advanced Methods in Biopsychology, PSYC 292 Advanced Methods in Sensation and Perception, PSYC 293 Advanced Methods in Learning, PSYC 294 Advanced Methods in Human Cognition; and select 300-level courses with a lab or research component. Each year the program director will publicize a list of courses that satisfy this requirement.
   c. Complete an Honors Thesis (NEUR 360).
2. ***Engagement in the scholarly community:*** The Neuroscience Visiting Speaker Series is organized annually by program faculty. In conjunction with each visiting speaker, a faculty member convenes a seminar meeting with students that includes reading, discussion and writing on the topic in preparation for the speaker's visit. Students will complete this portion of the Culminating Experience by participating in at least four of these during the course of the senior year and enrolling in NEUR 400 Senior Seminar in Neuroscience.

Upon completion of their Neuroscience major requirements, students will be able to:

1. Demonstrate an understanding of the fundamental concepts (e.g., in biology, psychology, chemistry) that are the underpinnings for the study of brains and behavior.
2. Understand how to approach neuroscience across model systems and organisms and from a number of perspectives, including molecular, cellular, cognitive, and behavioral, and explain how these perspectives inform each other.
3. Use the scientific method to design and conduct experiments, analyze data and interpret results, and arrive at conclusions based upon empirical evidence.
4. Engage critically with scholarly neuroscience literature.
5. Communicate neuroscience research using oral and written methods to expert and non-expert audiences
6. Articulate the connections between neuroscience and society, including the ethical implications of neuroscience research.

Courses

NEUR 101. Introduction to Neuroscience. 1 Credit.
Offered Summer Session Only; Lecture hours:3
An introduction to ideas, concerns, methods and applications in the field of neuroscience as students explore ways that our growing understanding of the nervous system intersects with technology, medicine, and law to impact human existence. Prerequisite: permission of the instructor. Only for BCCSP students.

NEUR 217. Psychopharmacology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Psychopharmacology, the study of drugs that affect behavior, begins with an appreciation for neurochemical, pharmacological and behavioral principles in order to understand actions and effects of therapeutic compounds and addictive substances, the two major categories of psychopharmacological drugs. Prerequisite: PSYC 100 or permission of the instructor. Crosslisted as PSYC 217.

NEUR 248. Developmental Psychobiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Addresses development in humans from conception through adolescence with some comparative analysis with non-humans. Emphasis on both normal and atypical cognitive, neuropsychological and neurobiological development. Prerequisite: PSYC 100. Crosslisted as PSYC 248.

NEUR 253. Cellular and Molecular Neurobiology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:3
In this course, we will cover the molecular and cellular mechanisms that drive neuronal function, and include topics such as excitable membrane physiology, synaptic transmission, plasticity and learning. The laboratory provides an evaluation of laboratory techniques relevant to neuroscience and analysis of papers. Crosslisted as BIOL 375.

NEUR 254. Behavioral Neuroscience. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Study of the the functions of the nervous system underlying behavioral, psychological, and cognitive processes in humans and animals. This course assumes prior knowledge in the fundamentals of cellular/molecular neuroscience. Prerequisite: NEUR 253.

NEUR 305. Neurodevelopmental Disorders. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines the genomic, neural, and environmental bases that underlie the development of children with developmental disabilities, including autism spectrum disorders, intellectual disabilities, and specific genetic/genomic syndromes. Takes a developmental psychopathology perspective, highlighting the reciprocal nature of the study of typical and atypical development. Prerequisites: NEUR 248/PSYC 248 and instructor permission. Crosslisted as PSYC 305 and PSYC 605.

NEUR 310. Neurophysiology of Wellbeing. 1 Credit.
Offered Occasionally; Lecture hours:3,Recitation:1
We will investigate the neurophysiological systems involved in wellbeing and stress including the autonomic nervous system, the gut-brain axis, and the endocrine system. For this investigation, we will read, analyze, and discuss primary and secondary literature on these topics. Crosslisted as PSYC 341 and PSYC 641.

NEUR 312. Biopsychology of Appetite and Obesity. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Reading and discussion of scholarly research on the neural, physiological, and endocrine signals that influence the psychology of appetite, food reward, eating behavior, and obesity in humans and animal models. Prerequisite: PSYC 250 or NEUR 254. Crosslisted as PSYC 312 and PSYC 612.

NEUR 313. Researching Behavioral Neuroscience. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Following a general orientation to behavioral genetics and pharmacology using mice, we will conduct group experiments. Each student will then develop and conduct an independent research project. Prerequisites: PSYC 215 or MATH 216 and PSYC 250 or NEUR 254 or permission of instructor. Crosslisted as NEUR 613 and PSYC 313 and PSYC 613.

NEUR 321. Neuroethics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will consider ethical, moral, legal and social implications that come from a growing ability to understand, predict and change human behavior. In a seminar format we'll consider right and wrong use of neuroscientific knowledge in clinical settings, law and criminal justice, national defense, economics, business and education. Crosslisted as PSYC 321 and PSYC 621.

NEUR 332. Developmental Neurobiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Developmental neurobiology with a laboratory section. Topics include: neural cell identity determination and differentiation; axon growth and target selection; formation and plasticity of neural connections; behavioral development. Prerequisites: BIOL 203 and BIOL 204 and permission of the instructor. Crosslisted as BIOL 332 and BIOL 632.

NEUR 344. Developmental Brain Research. 1 Credit.
Offered Spring Semester Only; Lecture hours:3; Repeatable
Students learn a variety of assessment techniques in developmental neuropsychology and neuroscience (including EEG) and conduct quantitative research culminating in written and oral reports. Crosslisted as PSYC 344 and PSYC 644 and NEUR 644. Prerequisite: permission of the instructor.

NEUR 360. Honors Thesis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:15; Repeatable
Prerequisite: permission of the department and permission of the instructor.

NEUR 368. Social Neuroscience. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Study of the brain basis of social behaviors such as bonding and attachment, parental behavior, play, social cognition, and the benefits of social support. We will investigate what is known about social function in the brains of species that have evolved to be social species, including humans. Crosslisted as PSYC 368 and PSYC 668.

NEUR 399. Undergraduate Research. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Research on any aspect of neuroscience. Research topics may be posed by students or faculty. Prerequisite: permission of the instructor.

NEUR 3NT. NEUR Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study course in neuroscience. Prerequisite: permission of the instructor.

NEUR 400. Senior Seminar in Neuroscience. 0 Credits.
Offered Spring Semester Only; Lecture hours:.5,Other:.5
NEUR majors may elect to attend a lecture series in the fall or spring semester to satisfy the Culminating Experience requirement. Students will prepare written reactions to each seminar, graded as pass/fail. Prerequisites: senior status and NEUR majors and permission of the instructor.

Nontraditional Study

Recognizing that there may be meaningful educational endeavors outside of the scheduled course or conventional independent study (which usually emphasizes library, laboratory or fieldwork), individual nontraditional study projects may be proposed. While such projects may be related to work experiences or internships, whether on or off campus, the student also must propose goals and procedures and ultimately produce materials for faculty evaluation, which give evidence of significant learning and advancement in an academic discipline at Bucknell University (and thus justify degree credit).

Nontraditional study projects may be arranged with any instructor; they must be approved by the department or program chair and by the academic dean. Approved projects are normally for 1.0 course credit; it is possible to propose 2.0, 3.0 or 4.0 credits. Projects are numbered according to level as follows:

- elementary (1NT),
- intermediate (2NT), and
- advanced (3NT).

The means of evaluation must be determined before the project is begun; grading may be either conventional (A-F) or pass/fail.

The nontraditional study program and the university course program include a quarter-credit option for unpaid internships. The course designated for the partial credit is UNIV 1NT Internship Credit. The UNIV 1NT Internship Credit program recognizes that the University has a strong interest in and commitment to facilitating more opportunities for students in the liberal arts who are interested in exploring opportunities in a variety of fields. Such internships round out formal academic experiences, particularly when completed within a structure that emphasizes self-reflection.

The number of UNIV 1NT Internship Credit opportunities is limited to two per student, or one-half credit toward the degree. Students may complete additional UNIV 1NT Internship Credit experiences and have those recorded on the transcript, but those additional experiences will not earn degree credit. Students may earn only pass/fail grades for UNIV 1NT Internship Credit. Students may not receive UNIV 1NT Internship Credit for participation in an internship for which they receive financial remuneration.

Additional information and proposal forms are available on the website of the Dean's Office of the College of Arts & Sciences or by contacting the office.

Peace & Conflict Studies Minor

Faculty

Coordinator: Janet T. Knoedler

Coordinating Committee: Janet T. Knoedler (Economics), Clare Sammells (Sociology & Anthropology), Ron J. Smith (International Relations)

Peace & conflict studies explores the causes and nature of human conflict from the interpersonal to the global level. A partial list of topics under peace & conflict studies includes: violence, war, ethnic conflict, conflict management, conflict resolution, peacemaking, law, human rights, values, justice, environment, racism, sexism and nonviolence. The goal of peace & conflict studies is to promote a more just and peaceful world through the concept of “positive peace” promoting social, political and economic justice.

The peace & conflict studies minor allows students to group courses that advance their interest in topics such as conflict, violence, genocide, ethnocide, gender-based violence, racism and anti-racism, and struggles for peace with justice. A peace & conflict studies minor will enrich students’ understanding of their respective major(s) and prove useful to students in graduate studies and/or future careers.

The peace & conflict studies minor consists of five courses. No more than two courses may be taken in the same department/program. Students may not count courses from their major department(s) toward the minor.

Independent studies and study-abroad courses will also be considered for the minor. Contact the chair of the minor Coordinating Committee for more information.

ANTH 109	Introduction to Cultural Anthropology (with Clare Sammells)	1
ANTH 243	Violence and Politics in Southeast Asia	1
ANTH 266	Money, Markets and Magic	1
HIST 224	Eighteenth-century North America	1
HIST 285	The Middle East in Global Perspective	1
HIST 311	U.S. History since 1865 ("Imperialism and Anti-Imperialism")	1
HIST 333	20th Century Germany	1
IREL 217	Environment Conflict and Security (with Emma Banks)	1
IREL 218	International Relations of Europe	1
IREL 229	Middle East Conflict and Revolution	1
IREL 255	International Law	1
IREL 275	Global Governance	1
LAMS 150	Latin America: An Introduction	1
MORS 231	Crisis Management	1
POLS 278	International Law	1
POLS 280	War (with Courtney Burns)	1
POLS 284	International Relations of Europe	1
POLS 290	Topics in Politics ("Military and Politics")	1
POLS 353	Comparative Ethnic Politics (with Soundarya Chidambaram)	1
RELI 200	Buddhism	1
SOCI 234	Criminology (with Karen Altendorf)	1
SOCI 243	Sociology of Race and Ethnicity	1
SOCI 251	Violence and Society (with Karen Altendorf)	1
WMST 150	Introduction to Women's and Gender Studies (with Coralynn Davis or Erica Delsandro)	1

Philosophy

Faculty

Professors: Peter S. Groff, Jason Leddington, Sheila M. Lintott, Matthew Slater (Chair)

Associate Professors: Adam Burgos, Jeffrey S. Turner

Assistant Professors: Maria Balcells, Jen Nguyen, Katherine Ward

Adjunct Instructor: Chris W. Rowe Jr.

Philosophy examines questions pertaining to the nature of language, truth, knowledge, reality, beauty and ethical commitment – questions that are so fundamental to human existence that they are neither easily answered nor easily ignored. The study of philosophy develops skills in interpreting texts, thoughtfully responding to other viewpoints, constructing and evaluating argumentation, and the disciplined imagining of novel possibilities for human knowing, valuing and living. In addition to its intrinsic interest and value, it also provides excellent training for graduate, medical, law or business school, and prepares students for a variety of potential careers, from the corporate world to nonprofit work to creative, educational or entrepreneurial pathways.

Bucknell's philosophy curriculum offers courses in a wide variety of subjects, figures, historical periods, traditions, movements and methodological perspectives. Some courses focus on general fields such as ethics, aesthetics, metaphysics, epistemology and logic. Others raise philosophical questions about topics such as mind, language, art, music, science, religion, politics, gender and law. Historically oriented courses range from the earliest Greek philosophers through revolutionary 20th-century thinkers such as Heidegger and Wittgenstein. Others span whole philosophical traditions (Chinese, Indian, Islamic, Jewish) or survey specific movements (existentialism, phenomenology, analytic philosophy, feminist philosophy).

Course Areas

Introductory

PHIL 100	Introduction to Philosophy	1

Logic

A study of the principles of reasoning.

PHIL 103	Logic	1
PHIL 201	Symbolic Logic	1

Core Historical Periods

Studies of the two essential periods in the history of Western philosophy: Ancient Greek (5th-4th c. BC) and modern European (17th-18th c.).

PHIL 205	Greek Philosophy	1
PHIL 207	History of Modern Philosophy	1

Axiology/Value Theory

One of the major branches of philosophy, axiology, concerns itself with the nature of value (axios), e.g., the good in ethics; justice in social and political philosophy; the right in law; and the beautiful, the sublime and the ugly in aesthetics.

PHIL 212	Philosophy of Art	1
PHIL 213	Ethics	1
PHIL 214	Social and Political Philosophy	1
PHIL 215	Philosophy of Music	1
PHIL 228	Contemporary Ethical Theory	1
PHIL 246	Philosophy of Law	1
PHIL 265	Contemporary Philosophy of Art	1
PHIL 274	Bioethics	1
PHIL 278	Topics in Value Theory	1

Metaphysics and Epistemology

Two major branches of philosophy, which are closely intertwined. Metaphysics concerns itself with the most general of all topics: being or existence itself. What does it mean to be? What are the ultimate constituents of reality? It encompasses numerous subtopics such as the nature of universals, mind, personal identity, freedom, time and God. Epistemology constitutes a systematic investigation into the nature, sources and limitations of knowledge.

PHIL 220	Philosophy of Science	1
PHIL 223	Philosophy of Religion	1
PHIL 224	Theory of Knowledge	1
PHIL 225	Metaphysics	1
PHIL 226	Philosophy of Mind	1
PHIL 227	Philosophy of Language	1
PHIL 234	Philosophy of Time	1
PHIL 268	Topics in Metaphysics and/or Epistemology	1
PHIL 272	Philosophy of Biology	1

Movements and Traditions

Many important philosophical figures, problems and positions are deeply rooted in particular movements and traditions. These can represent radically different philosophical perspectives, concerns or ways of thinking.

PHIL 206	Medieval Philosophy	1
PHIL 219	The Problem of False Consciousness	1
PHIL 229	Philosophy and Race	1
PHIL 230	Feminist Philosophy	1

PHIL 256	From Hegel to Nietzsche	1
PHIL 257	Critical Theory: Antisemitism, Barbarism, Capitalism	1
PHIL 258	Existentialism	1
PHIL 260	Phenomenology	1
PHIL 262	Contemporary Continental Philosophy	1
PHIL 264	Latin American, Latinx and Caribbean Philosophy	1
PHIL 266	Chinese Philosophy	1
PHIL 267	Arabic Philosophy	1
PHIL 280	Buddhist Philosophy in Comparative Perspective	1
PHIL 288	Topics in Philosophical Movements and Traditions	1

Individual Work

Individual studies and senior or honors theses must be specially arranged with the professor who will be supervising it. Theses may contribute to the culminating experience for the major (see Major Requirements for more detail). Students contemplating writing an honors thesis should be in contact with a potential supervisor for it by the spring semester of their junior year.

PHIL 320	Individual Studies in Philosophy	1
PHIL 323	Senior Thesis	1
PHIL 324	Honors Thesis	1
PHIL 325	Honors Thesis	1

Advanced Seminars

The department offers one advanced seminar every semester on varying topics. These courses are primarily intended for senior majors but are open to students from other classes and other departments with sufficient prior coursework in philosophy, by permission of the instructor. Advanced seminars may be repeated for credit.

PHIL 330	Advanced Seminar	1

Philosophy Major

The philosophy **major** consists of a minimum of nine courses drawn from different areas:

Introduction to Philosophy requirement:		**1**
PHIL 100	Introduction to Philosophy (any section) [1]	
Logic requirement:		**1**
PHIL 103	Logic	
or PHIL 201	Symbolic Logic	
Two Core Historical Period requirements:		**2**
PHIL 205	Greek Philosophy	
PHIL 207	History of Modern Philosophy	
Select one Axiology (Value Theory) requirement:		**1**
PHIL 212	Philosophy of Art	
PHIL 213	Ethics	
PHIL 214	Social and Political Philosophy	
PHIL 215	Philosophy of Music	
PHIL 228	Contemporary Ethical Theory	
PHIL 246	Philosophy of Law	
PHIL 265	Contemporary Philosophy of Art	
PHIL 274	Bioethics	
PHIL 278	Topics in Value Theory	
Select one Metaphysics and Epistemology requirement:		**1**
PHIL 220	Philosophy of Science	
PHIL 223	Philosophy of Religion	
PHIL 224	Theory of Knowledge	
PHIL 225	Metaphysics	
PHIL 226	Philosophy of Mind	
PHIL 227	Philosophy of Language	

PHIL 234	Philosophy of Time	
PHIL 268	Topics in Metaphysics and/or Epistemology	
PHIL 272	Philosophy of Biology	
Select one Movements and Traditions requirement:		**1**
PHIL 206	Medieval Philosophy	
PHIL 219	The Problem of False Consciousness	
PHIL 229	Philosophy and Race	
PHIL 230	Feminist Philosophy	
PHIL 256	From Hegel to Nietzsche	
PHIL 257	Critical Theory: Antisemitism, Barbarism, Capitalism	
PHIL 258	Existentialism	
PHIL 260	Phenomenology	
PHIL 262	Contemporary Continental Philosophy	
PHIL 264	Latin American, Latinx and Caribbean Philosophy	
PHIL 266	Chinese Philosophy	
PHIL 267	Arabic Philosophy	
PHIL 280	Buddhist Philosophy in Comparative Perspective	
PHIL 288	Topics in Philosophical Movements and Traditions	
Advanced Seminars/Culminating Experience		**2-4**
Select one of the following options:		
Option 1		
Two Advanced Seminars (PHIL 330)		
Option 2		
PHIL 323	Senior Thesis	
PHIL 330	Advanced Seminar	
Option 3		
PHIL 324	Honors Thesis	
PHIL 330	Advanced Seminar	

[1] This course is a prerequisite for most 200 and 300-level PHIL courses.

This curriculum aims at providing students with a balance of breadth and depth in the field while allowing them a large degree of flexibility to choose the specific courses that best fit their particular interests.

The learning goals of the philosophy major include:

1. a general comprehension of several major periods and authors in the history of Western philosophy,
2. skill in constructing and evaluating argumentation,
3. skill in developing and evaluating interpretations of philosophical texts, and
4. an appreciation of the fundamental ambiguities and complexities involved in the human attempt to answer questions about knowing, valuing and living.

In addition to these discipline-specific goals, the philosophy major is designed to cultivate a number of more general skills and competencies in accordance with the “Disciplinary Depth” component of the College of Arts & Sciences Core Curriculum. They are:

1. **Skills in writing.** Students majoring in philosophy will gain significant experience in the written analysis and evaluation of texts and arguments. Almost every course offered by the philosophy department includes both an intensive and an extensive focus on writing skills.
2. **Skills in formal presentation.** Regardless of one’s eventual choice of profession, one must develop skills in oral argumentation, articulate discussion and persuasion. Many of the courses offered by the philosophy department include work that will enhance students’ oral presentation skills, including individual and/or group presentations, oral summaries and other presentations of assigned work, and formal classroom debates. All students in PHIL 207 History of Modern Philosophy will develop skills in preparing, revising and delivering oral presentations of various kinds, including individual presentations, group presentations and/or formal in-class debates. In addition, in many of the 300-level seminars offered by the philosophy department, students will further develop their formal presentation skills.
3. **Information literacy.** Students majoring in philosophy will gain facility in the use of both primary and secondary sources; learn how to locate, access and retrieve both primary and secondary materials; learn to evaluate these materials critically through in-class discussion and their written

work; become familiar with the legal and ethical standards of information access and use; and learn to use various technological resources in support of their academic work. All students in PHIL 205 Greek Philosophy will devote special attention to the development of information literacy.

4. **Culminating Experience (CE).** Students majoring in philosophy will complete a two-part Culminating Experience, usually during the senior year. The Culminating Experience is designed to distill and synthesize students' previous studies in philosophy, enriching and cementing the knowledge and skills mentioned above. Students engaged in the Culminating Experience will typically have completed most if not all of the other major requirements. To fulfill the Culminating Experience in philosophy, students will either take two 300-level seminars in philosophy or take one 300-level seminar in philosophy and write a senior or honors thesis. At least one of these seminars (or the student's thesis, if the student elects to write one) must be taken during the student's senior year with the exception that second-semester juniors may complete this Culminating Experience in the major with permission of the adviser and the department chair.

Philosophy majors interested in study abroad are encouraged by the department to do so and may work with faculty in the department to find a program of study suitable to their interests. Qualified students are also encouraged to pursue honors study in philosophy; they should consult with their department advisers or with the chair of the department in advance about this option. Students will be expected to submit a substantial honors thesis, the equivalent of two semesters of work, in their senior year. Credit may be taken either in one semester of the senior year or two. Students pursuing this course of study are exempt from one of the two required CE-related senior seminars. Students wishing to do graduate work in philosophy may want to supplement their philosophical studies with language courses, for example in ancient Greek, Latin, French, German, Chinese or Arabic.

Minor in Philosophy

The **minor** in philosophy consists of four courses, two of which must be 200-level or above. No particular combination of courses is required and students may wish to design a minor with their particular interests and aims in mind.

The learning goals of the philosophy major are:

1. A general comprehension of several major periods and authors in the history of Western philosophy.
2. Skill in constructing and evaluating argumentation.
3. Skill in developing and evaluating interpretations of philosophical texts.
4. An appreciation of the fundamental ambiguities and complexities involved in the human attempt to answer questions about knowing, valuing and living.

Courses

PHIL 100. Introduction to Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
An introduction to the main topics, fields and figures of philosophy. Multiple sections of this course are offered every semester, under a variety of titles.

PHIL 103. Logic. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Logic is the study of good reasoning. This course introduces methods for identifying and evaluating arguments and considers social/psychological barriers to good reasoning. Students will also be introduced to formal (symbolic) approaches to logic.

PHIL 201. Symbolic Logic. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
This course introduces students to formal / symbolic approaches to the study of logical reasoning including propositional, first-order predicate logic, and formal inductive logic. The course will also address philosophical questions concerning logic and the foundations of mathematics. PHIL 103 is recommended but optional preparation for this course.

PHIL 203. Philosophical Teach-In. .5 Credits.
Offered Occasionally; Lecture hours:1.5; Repeatable
A course applying philosophical theories to a topic of contemporary interest. Offered occasionally under different titles.

PHIL 205. Greek Philosophy. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Studies of the ancient Greek notions of kosmos, society, and soul, through readings of the Presocratics, Plato, and Aristotle. Some attention will also be paid to the mythic/poetic background from which philosophy arises for the ancient Greeks. Prerequisite: PHIL 100 or PHIL 103 or PHIL 201 or permission of instructor.

PHIL 206. Medieval Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A comparative examination of Jewish, Christian, and Islamic traditions in medieval philosophy. Questions will focus on God, free will, the problem of evil, the meaning of history, the fate of the soul, and the good life. Readings in Augustine, Avicenna, Maimonides and Aquinas. Prerequisite: PHIL 100 or permission of instructor.

PHIL 207. History of Modern Philosophy. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Philosophical thought in the classical modern age, including Continental Rationalism, British Empiricism, and Kant. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 212. Philosophy of Art. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of the creative process, the work of art, natural beauty, aesthetic experience, and principles of criticism. Crosslisted as ARTH 222.

PHIL 213. Ethics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
An attempt to formulate adequate criteria for the basic moral conceptions of good and bad, right and wrong, and duty, by a study of leading ethical view points from Plato to the present. Prerequisite: PHIL 100 or PHIL 103 or PHIL 201 or permission of the instructor.

PHIL 214. Social and Political Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Problems such as individual and state, freedom and organization, power and rectitude, philosophy of law, equity and differences, the sociomoral basis of rights.

PHIL 215. Philosophy of Music. 1 Credit.
Offered Occasionally; Lecture hours:3
What is music—sound waves? live performances? streaming audio code? a conductor's score? Is music a language—does it have meaning or emotions? Who decides: the listener or composer? Are associations with specific sounds—say, a siren—cultural? physiological? Creativity and analysis from brilliant modern philosophers helps us explore! Crosslisted as MUSC 215.

PHIL 219. The Problem of False Consciousness. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examination of leading theories of individual and mass deception, as well as theories of self-deception, as these theories bear on the task of informed decision making. Philosophers to be studied may include: Freud, Marx, Sartre, Jung, Foucault, Lukacs, Habermas. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 220. Philosophy of Science. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to foundational metaphysical, epistemological, methodological, and ethical questions concerning science and scientific practice. Particular attention will be paid to theory confirmation, observation and experiment, explanation, scientific progress and revolution. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 223. Philosophy of Religion. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Problems for rational inquiry arising from the claims and practices of religious faith; the nature of religious experience and language, arguments for God's existence, evil. Crosslisted as RELI 216.

PHIL 224. Theory of Knowledge. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Addresses topics related to the nature and acquisition of knowledge, such as belief, justification, evidence, perception, testimony, and skepticism. Readings may include both classic and contemporary authors, such as Plato, Descartes, Russell, Austin, Davidson, Goldman, McDowell, and Sosa. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 225. Metaphysics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An inquiry into the nature of being/reality. Topics may include the ontological status of universals, mind, personal identity, freedom, time and God. Readings in such thinkers as Plato, Aristotle, Ockham, Descartes, Leibniz, Berkeley, Kant, Bergson and Heidegger. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 226. Philosophy of Mind. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A study of topics in the philosophy of the mind, such as the mind-body problem, thought, consciousness, perceptual experience, and artificial intelligence. Readings may include both classic and contemporary authors, such as Descartes, Hume, Ryle, Davidson, Fodor, Dennett, and Chalmers.

PHIL 227. Philosophy of Language. 1 Credit.
Offered Occasionally; Lecture hours:3
An examination of philosophical problems concerning the nature of language, meaning, and communication. Readings may include both classic and contemporary authors, such as Locke, Mill, Frege, Russell, Wittgenstein, Austin, Quine, Davidson, Dummett, Kripke, and Kaplan. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 228. Contemporary Ethical Theory. 1 Credit.
Offered Occasionally; Lecture hours:3
Contemporary approaches to the problems of ethics: universality, moral vs. non-moral judgments, facts and values, etc. Readings in such thinkers as Williams, MacIntyre, Nussbaum, Rorty, Korsgaard, and Hursthouse. Prerequisite: PHIL 100 or PHIL 103 or PHIL 201 or permission of the instructor.

PHIL 229. Philosophy and Race. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Critical examination of the nature and meaning of "race" in terms of conceptual analysis, experience, social constructionism, feminism, class, ethnicity, politics, colonialism, violence, and redress. Crosslisted as CBST 229 and POLS 259.

PHIL 230. Feminist Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of feminist philosophy primarily as it occurs in the U.S. from the late 18th century to the present. Crosslisted as WMST 230.

PHIL 234. Philosophy of Time. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An inquiry into the nature of time from various historical and contemporary perspectives. Possible topics include the puzzle of change, the passage of time, the relation between our experience of time and the scientific image of time, the direction of time, personal identity over time, and time travel.

PHIL 246. Philosophy of Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examination of some central philosophical issues relating to law, including law's relation to economics, literature, democracy, rules, integrity, and interpretation. Prerequisite: PHIL 100 or PHIL 103 or PHIL 201 or permission of the instructor.

PHIL 256. From Hegel to Nietzsche. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
The rise, fall, and reaction to German Idealism in 19th-century continental thought. Philosophers to be studied may include: Hegel, Schopenhauer, Marx, Kierkegaard, and Nietzsche. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 257. Critical Theory: Antisemitism, Barbarism, Capitalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the Frankfurt School's program of social critique - inspired by Kant, Hegel, Marx and Freud - which indicted fascism and antisemitism and struck at the heart of modernity: capitalism, culture, Enlightenment, reason and freedom. They ask us, Is ethical life possible under contemporary conditions of barbarism?.

PHIL 258. Existentialism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of selected texts of Kierkegaard, Dostoevsky, Camus, or Sartre. Special attention given to the relation of existentialism to problems of post-Cartesian thought. Prerequisite: PHIL 100 or PHIL 103 or PHIL 201 or permission or the instructor.

PHIL 260. Phenomenology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of selected texts of Husserl, Heidegger, or Merleau-Ponty. Some consideration of the interpretation of the history of philosophy offered by phenomenology. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 262. Contemporary Continental Philosophy. 1 Credit.
Offered Occasionally; Lecture hours:3
A survey of some major currents and figures in 20th-century philosophy. Philosophers to be studied may include: Husserl, Heidegger, Sartre, Merleau-Ponty, Benjamin, Barthes, Foucault, Derrida, Levinas. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 264. Latin American, Latinx and Caribbean Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will focus on major figures and issues within philosophy in Latin America, the Caribbean and the Latinx U.S., with an emphasis on the connection between identity-formation and politics. Crosslisted as LAMS 264.

PHIL 265. Contemporary Philosophy of Art. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An investigation of and focused study of contemporary philosophical issues in the arts and aesthetics more generally. Crosslisted as ARTH 265.

PHIL 266. Chinese Philosophy. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An introduction to Chinese thought, including: the major schools and thinkers of the classical age, Chinese Buddhist philosophy, early modern Neo-confucianism, and Chinese philosophy since the Communist Revolution of 1949. Crosslisted as EAST 266 and HUMN 266.

PHIL 267. Arabic Philosophy. 1 Credit.
Offered Occasionally; Lecture hours:3
A survey of the Arabic philosophical tradition. Topics discussed include the good life, the status of the philosopher in society, God, death and the afterlife, the political function of prophecy, and reason, faith and reason as potential sources of knowledge. Figures studied include al-Razi, al-Farabi, Avicenna, al-Ghazali, Ibn Tufayl, etc.

PHIL 268. Topics in Metaphysics and/or Epistemology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Focused study of specific topics in metaphysics and/or epistemology, such as space and time, possible worlds, the mind-body problem, truth, skepticism, virtue epistemology, and norms of assertion. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 272. Philosophy of Biology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
We will survey the central epistemological and metaphysical problems addressed in the 20th-century philosophy of biology. Prerequisite: PHIL 100 or permission of the instructor.

PHIL 274. Bioethics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines a variety of topics in contemporary bioethics including biomedical ethics, public health, disability, human enhancement and climate change. Our aim will be to understand the complex ethical issues that arise at both the individual and global level through case studies and philosophical texts.

PHIL 278. Topics in Value Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Focused study of specific topics in value theory, such as specific topics in ethical theory, applied ethics, social and political philosophy, and philosophy of art or aesthetics. Prerequisite: varies.

PHIL 280. Buddhist Philosophy in Comparative Perspective. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to Buddhist thought in comparative perspective, through a close reading and discussion of primary texts of the classical, medieval, modern and contemporary traditions. Prerequisite: PHIL 100. Crosslisted as HUMN 280.

PHIL 288. Topics in Philosophical Movements and Traditions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Focused study of specific topics in philosophical movements and/or traditions, such as specific topics in existentialism, feminist theory, philosophy of peace, and in Chinese, Medieval, Indian, or Islamic philosophy.

PHIL 299. Teaching Assistant in Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course can only be taken by philosophy majors who have permission and have taken the prerequisite. Prerequisite: PHIL 100 and permission of the instructor.

PHIL 320. Individual Studies in Philosophy. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Open to advanced students who wish to pursue individual programs of study under the supervision of a professor, or of a committee of professors if the subject falls within two or more departments. May be conducted as a seminar for three or more students pursuing similar programs.

PHIL 323. Senior Thesis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Independent research on a philosophical issue, in consultation with staff members. The thesis should show integrative and creative abilities. Prerequisite: major in philosophy or permission of the instructor.

PHIL 324. Honors Thesis. 1 Credit.
Offered Fall Semester Only; Lecture hours:Varies
Substantial independent work on some problem or topic approved by the Department of Philosophy and the Honors Council as satisfying the requirements for a senior honors thesis. Prerequisite: permission of the instructor. Not open to students who have taken PHIL 321 or PHIL 322.

PHIL 325. Honors Thesis. 1 Credit.
Offered Spring Semester Only; Lecture hours:Varies
Second semester of independent work on some problem or topic approved by the Department of Philosophy and the Honors Council as satisfying the requirements for a senior honors thesis. Prerequisites: PHIL 324 and permission of the instructor. Not open to students who have taken PHIL 321 or PHIL 322.

PHIL 330. Advanced Seminar. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Advanced seminars typically focus on a particular philosophical figure, historical period or movement, or a significant topic area in philosophy and are intended to engage students at an advanced level of preparation in intensive philosophical discussion and in-depth study. Prerequisites: senior philosophy major standing or permission of the instructor.

Physics & Astronomy

Faculty

Professors: JiaJia Dong, Jack F. Gallimore, Sally Koutsoliotas, Edwin F. Ladd, Thomas H. Solomon, Katharina Vollmayr-Lee

Associate Professors: A. Matthew Amthor, Ibrahim A. Sulai, Michele D. Thornley, Benjamin P. Vollmayr-Lee (Chair)

Assistant Professors: Bekele Gurmessa, Deepak Iyer, Abigail Kopec, Jackie Villadsen

Visiting Assistant Professor: Ofelia Traistaru

Physics is the fundamental science of the natural world. The study of physics and astronomy leads to a deeper appreciation and awareness of the world around us. From the quantum mechanical behavior at the smallest scale, to the workings of the cosmos at the largest scale, physics consists of a few general principles that explain a vast range of phenomena. Coursework in physics leads to an understanding of these phenomena and gives students experience in abstract mathematical modeling as well as experimental and computational techniques. As a means to enhance the physics curriculum, research opportunities in astronomy and physics are available and strongly encouraged.

A physics major is an appropriate first step on the path to a career as a research scientist. Because physics is such a fundamental science, it can be the basis for the understanding of principles that are relevant to a wide variety of fields. It provides preparation for graduate study in physics or in related fields, such as astrophysics, biophysics, medical physics, chemical physics, geophysics or engineering. A fundamental understanding of nature has been a goal throughout history, and a study of physics can be the focus of a liberal education because of its connections with intellectual history and philosophy. A major in physics can be the platform for pursuing a wide variety of careers, including medicine, law, business and teaching.

A major in physics may be pursued under the bachelor of arts or bachelor of science degree programs, either of which can provide adequate preparation for graduate study. Students in the bachelor of arts program who plan to attend graduate school in physics or astronomy should consult with their advisers to select an appropriate set of electives. The department also offers an astrophysics concentration as an option in the physics bachelor of science degree program and a distinct bachelor of science degree program for a major in biophysics for students with particular interest in these areas of physics. The standard entry point for all degree programs is the yearlong introductory sequence PHYS 211/PHYS 212.

Modern astrophysics involves the application of physics toward understanding the workings of the universe. Students interested in an introductory survey are encouraged to enroll in ASTR 101 or ASTR 102. Students interested in the astrophysics concentration of the physics bachelor of science degree program can obtain a strong grounding in fundamental physics with specialized coursework in ASTR 201 and ASTR 301 (cross-listed as PHYS 301). This concentration is primarily designed for students considering advanced study in astrophysics or careers in astronomy and related fields.

Biophysics is an interdisciplinary field that applies the theories and methods of physics to problems in biology, medicine and related fields. Biophysics is a vibrant, growing field driven by the large amount of detailed data now available in 21st century biological research. Biophysicists are uniquely trained in the quantitative sciences of physics, mathematics and chemistry to process these data and build models to describe a wide array of topics, from cell signaling to photosynthesis to how cells are transformed from healthy to cancerous.

The biophysics major is highly interdisciplinary resulting in a strong foundation in physics, biology, chemistry and mathematics. Students will develop skills in laboratory techniques, computer programming, data analysis and mathematical modeling. The subject matter ranges from the fundamental principles of physics to chemical reactions and processes to complex biological systems. This broad curriculum provides students majoring in biophysics with opportunities for careers in biotechnology, biomedical technology, medicine and medical physics. The biophysics major also provides a solid grounding for pursuing a Ph.D. in biophysics or related fields.

The Department of Physics & Astronomy encourages students to participate in research projects. Research serves as an important complement to the classroom study of physics and astronomy. The department offers research opportunities in atomic and molecular physics, chaos and nonlinear dynamics, astronomy and astrophysics, theoretical quantum optics, laser spectroscopy, nuclear physics, biophysics, condensed matter theory and computer simulation, and statistical physics.

Bachelor of Arts in Physics

A **Bachelor of Arts major** in physics consists of:

PHYS 211	Classical and Modern Physics I	1
PHYS 212	Classical and Modern Physics II	1
PHYS 221	Classical Mechanics	1
PHYS 222	Wave Mechanics and Quantum Physics	1
PHYS 310	Experimental Physics	1
A minimum of three other 200 or 300-level physics courses, two of which must be at the 300 level.		3
One of the 300-level courses must be one of the following:		
PHYS 317	Thermodynamics and Statistical Mechanics	
PHYS 331	Advanced Classical Mechanics	
PHYS 332	Quantum Mechanics	
PHYS 333	Electromagnetic Theory I	
Other courses may include:		
ASTR 201	Observational Astrophysics	
ASTR 301	Astrophysics	

Bachelor of Science in Physics

A **Bachelor of Science major** in physics consists of:

PHYS 211	Classical and Modern Physics I	1
PHYS 212	Classical and Modern Physics II	1
PHYS 221	Classical Mechanics	1
PHYS 222	Wave Mechanics and Quantum Physics	1
PHYS 235	Applied Electronics	1
PHYS 310	Experimental Physics	1
PHYS 317	Thermodynamics and Statistical Mechanics	1
PHYS 331	Advanced Classical Mechanics	1
PHYS 332	Quantum Mechanics	1
PHYS 333	Electromagnetic Theory I	1
A minimum of two other 300-level physics credits [1]		2
MATH 212	Differential Equations	1
or MATH 245	Linear Algebra	

[1] These courses may include ASTR 301 Astrophysics.

Bachelor of Science in Physics with a Concentration in Astrophysics

A **Bachelor of Science major in physics with a concentration in astrophysics** consists of:

PHYS 211	Classical and Modern Physics I	1
PHYS 212	Classical and Modern Physics II	1
PHYS 221	Classical Mechanics	1
PHYS 222	Wave Mechanics and Quantum Physics	1
ASTR 201	Observational Astrophysics	1
PHYS 310	Experimental Physics	1
PHYS 317	Thermodynamics and Statistical Mechanics	1
PHYS 331	Advanced Classical Mechanics	1
PHYS 332	Quantum Mechanics	1
PHYS 333	Electromagnetic Theory I	1
ASTR 301	Astrophysics	1
A minimum of one other 300-level physics credit		1
MATH 212	Differential Equations	1
or MATH 245	Linear Algebra	

In addition to the required coursework, students pursuing a concentration in astrophysics will be advised to participate in one or more on-campus or off-campus research experiences in astronomy or astrophysics. Such opportunities are frequently offered by department faculty as well as through a number of research programs for undergraduates that are hosted at observatories, research institutes and other universities across the country.

The recommended course sequence for students pursuing the bachelor of science physics major is the following:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
PHYS 211	1	PHYS 212	1
MATH 201	1	MATH 202	1
	2		**2**
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
PHYS 221	1	PHYS 222	1
MATH 211	1	PHYS 235	1

		MATH 212 or 245	1
		2	**3**

Junior

First Semester	Credits	Second Semester	Credits
PHYS 332	1	PHYS 310	1
PHYS 333	1	Elective(s) in physics	1
	2		**2**

Senior

First Semester	Credits	Second Semester	Credits
PHYS 331	1	Elective(s) in physics	1
PHYS 317	1		
	2		**1**

Total Credits: 16

Additional Notes

A physics major leading to the bachelor of arts degree also is available in combination with a bachelor of science in engineering in a five-year program.

Courses in all of our degree programs are designed to provide students with many opportunities to practice and develop their writing, speaking, and information literacy skills, consistent with the learning objectives of the College of Arts & Science Core Curriculum (CASCC).

Students in our department also satisfy the Culminating Experience component of the College of Arts & Science Core Curriculum (CASCC) by taking PHYS 310 Experimental Physics, a required course for both B.S. and B.A. majors, in the spring of either their junior or senior year. In this course students perform substantial multi-week experiments that explore concepts that they have learned throughout the major, including classical mechanics, wave phenomena, electricity and magnetism, quantum physics, thermodynamics, computer simulation and astronomy. This course also stresses other learning objectives through writing of research papers and weekly oral presentations.

Honors in physics is given to those students who are accepted by the University Honors Council and successfully complete and defend an honors thesis in physics.

Study abroad is possible for students completing either a bachelor of arts or bachelor of science degree. Such study should be discussed well in advance with the academic adviser and the chair of the Department of Physics & Astronomy.

Students wishing to become certified as secondary school physics teachers should consult with the Department of Education and the chair of the Department of Physics & Astronomy to arrange a plan of study that ensures that all of the requirements for certification will be met.

Bachelor of Science in Biophysics

A **Bachelor of Science major** in biophysics consists of a total of 14 courses with the following list of 11 required courses:

PHYS 211	Classical and Modern Physics I	1
PHYS 212	Classical and Modern Physics II	1
BIOL 203	Integrated Concepts in Biology Fall	1
BIOL 204	Integrated Concepts in Biology Spring	1
CHEM 205	Principles of Chemistry	1
or CHEM 207	Explorations in Chemistry	
CHEM 211	Organic Chemistry I	1
MATH 211	Calculus III [1]	1
PHYS 222	Wave Mechanics and Quantum Physics	1
PHYS 315	Experimental Biophysics	1
PHYS 317	Thermodynamics and Statistical Mechanics	1
PHYS 340	Biophysics	1
And three advanced electives from the following list of courses, with at least one elective from BIOL, and up to one credit-bearing research with faculty: [2]		3
Advanced electives in Physics:		
PHYS 303	Modern Optics	
PHYS 331	Advanced Classical Mechanics [3]	
PHYS 332	Quantum Mechanics	
PHYS 333	Electromagnetic Theory I	

PHYS 334	Electromagnetic Theory II [3]
PHYS 338	Computer Simulations in Physics
PHYS 339	Advanced Quantum Mechanics and Particle Physics [3]
Advanced electives in Biology:	
BIOL 302	Microbiology
BIOL 306	Biology of Host-Microbe Interactions
BIOL 312	Comparative Vertebrate Anatomy
BIOL 313	Mammalogy
BIOL 318	Principles of Physiology
BIOL 327	Molecular Biology
BIOL 328	Endocrinology
BIOL 331	Genomics
BIOL 339	Developmental Biology
BIOL 340	Biochemical Methods
BIOL 347	Virology
BIOL 352	Cell Biology
BIOL 362	Topics in Cell Biology
BIOL 365	Introduction to Microscopy
Advanced electives in Chemistry: [4]	
CHEM 341	Physical Chemistry I
CHEM 347	Special Topics in Physical Chemistry
CHEM 351	Biochemistry I
CHEM 358	Biochemical Methods

1 MATH 211 is a required major-related course.
2 For the three 300-level electives, students who complete BIOL 201 are not required to choose a BIOL course as one of these three electives.
3 These courses include a prerequisite that is not part of the core curriculum for biophysics.
4 Students who are interested in a more chemistry-focused direction can pursue this path by taking CHEM 212 and CHEM 231.

Recommended course sequences are available at www.eg.bucknell.edu/physics/biophysics/ (http://www.eg.bucknell.edu/physics/biophysics/).

Courses in the biophysics degree program are designed to provide students with many opportunities to practice and develop their writing, speaking and information literacy skills, consistent with the learning objectives of the College of Arts & Science Core Curriculum (CASCC).

Students majoring in biophysics also satisfy the Culminating Experience component of the College of Arts & Sciences Core Curriculum (CASCC) by taking the combination of PHYS 315 Experimental Biophysics and PHYS 340 Biophysics. PHYS 315 Experimental Biophysics is a W-2 course within the major and provides a suite of project-based modules to hone in experimental skills in probing biological systems. In addition, students will write research-style papers, work in teams and present the research outcomes in this course. Complementary to the experimental aspects, PHYS 340 is a theory-based course that studies the physics of cellular structures and processes, with emphasis on mechanics and thermodynamics of biological systems.

Study abroad is possible for students majoring in biophysics. Students are strongly encouraged to plan such study so that they can complete their culminating experience in time. It is also advised that students discuss their plan to study abroad well in advance with the academic adviser and the chair of the Department of Physics & Astronomy.

Minor in Physics

A **minor** in physics consists of four 200 or 300-level physics courses, which may include ASTR 201. Advanced placement credit does not count toward the minor.

Majors in Physics (B.A. and B.S.) and Biophysics (B.S.) will:

- Be able to solve quantitative problems that require an understanding of the fundamental principles in each of the major areas of physics. Show a working knowledge of how a broad array of physical phenomena can be explained using these fundamental concepts.
- Exhibit a proficiency in the methods of scientific inquiry in laboratory and/or research projects.
- Use critical thinking skills to formulate and solve quantitative problems.
- Present well-organized, logical and scientifically sound oral and written scientific reports.
- Understand the variety of career paths and opportunities that are open to students who have majored in physics and/or astronomy.

Non-majors in Physics (meeting laboratory science requirements) will:

- Demonstrate an understanding of fundamental concepts in a field of physics and/or astronomy.
- Develop an appreciation for the methods of scientific inquiry through laboratory experiences.
- Demonstrate the critical thinking and problem solving skills required in scientific disciplines.

Astronomy Courses

ASTR 101. Our Solar System. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
An introduction to astronomy concentrating on our evolving understanding of the solar system. Designed for non-science majors. No prerequisite.

ASTR 102. Stars, Galaxies, and Beyond. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
An introduction to astronomy concentrating on the structure of our universe beyond the solar system. Designed for non-science majors. ASTR 101 is not a prerequisite for ASTR 102.

ASTR 201. Observational Astrophysics. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:2,Other:2
This course covers spherical astronomy and observational techniques, and applications of physics to solar system objects, stars, stellar evolution, galaxies, and cosmology. Some night observing required. Laboratories focus on observational techniques and data reduction. Prerequisite: PHYS 212 or PHYS 212E.

ASTR 301. Astrophysics. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
An introduction to general astrophysics covering mechanics of orbiting bodies, radiation laws, stellar spectra, stellar atmospheres, the internal constitution of stars, stellar energy, galaxies, and cosmology. Prerequisites: PHYS 222 and MATH 212, or permission of the instructor. Crosslisted as PHYS 301.

ASTR 337. Independent Study in Astronomy/Astrophysics. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Seminar or independent study in areas of current interest in the astronomy/astrophysics community. Prerequisite: permission of the instructor.

ASTR 338. Contemporary Study in Astronomy/Astrophysics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Seminar in topics of current interest in the astronomy and astrophysics community. Co- and prerequisites are dependent on topic and instructor. Prerequisite: permission of the instructor.

ASTR 350. Undergraduate Research. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Undergraduate research in astronomy/astrophysics. Prerequisite: permission of the instructor.

Physics Courses

PHYS 140. Physics for Future Leaders. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
The science behind key issues facing us as engaged citizens and future leaders. Topics include energy, climate change, space travel, and technology, as well as the processes that lead to scientific progress. Designed for non-science majors. No prerequisites. Not open to students who have completed a 200-level physics course.

PHYS 141. Secrets of the Universe. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
The great ideas of 20th-century physics (symmetry principles, relativity, and quantum mechanics) and their application to cosmology and the evolution of the universe. Also, historical development and philosophical implications of these ideas. Designed for non-science majors. No prerequisite. Not open to students who have successfully completed a 200-level physics course.

PHYS 142. Light and Vision. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
Particle and wave theories of light, cameras and optical instruments, the visual process, lasers, and optical communications. Designed for non-science majors. No prerequisite. Not open to students who have successfully completed a 200-level physics course.

PHYS 143. The Physics of Time and Time-Keeping. 1 Credit.
Offered Either Fall or Spring; Lecture hours:1,Other:3
Timekeeping from astronomical to mechanical to atomic, time in physics from classical to relativistic to quantum, the physics of time from irreversibility to simultaneity to singularity. Designed for nonscience majors. No prerequisites. Not open to students who have successfully completed a 200-level physics course.

PHYS 144. How Things Work. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
This course introduces the ideas of physics in the context of everyday phenomena, including common inventions and topics in medicine, sports, and music. Designed for non-science majors. No prerequisite. Not open to students who have successfully completed a 200-level physics course.

PHYS 146. Science and Technology in War and Peace. 1 Credit.
Offered Occasionally; Lecture hours:3
The tug of war between human frailties and yearning for peace has generated a plethora of scientific discoveries and technological innovations: electro-magnetism, wireless communications, lasers, the Internet, hypersonic missiles, and nuclear reactions. Designed for non-science majors. No prerequisites. Not open to students who have successfully completed a 200-level physics course.

PHYS 147. Energy and Sustainability. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
Examination of energy, its transformations, its effects on resource depletion, and environmental degradation. Models of sustainability for transportation, architecture, waste management, and personal lifestyle choices. Designed for non-science majors. No prerequisite. Not open to students who have successfully completed a 200-level physics course.

PHYS 211. Classical and Modern Physics I. 1 Credit.
Offered Fall Semester Only,TLC Tutoring Course; Lecture hours:2,Other:5
The first course in a two-course sequence that surveys major areas of physics. Topics include Newtonian mechanics, relativity, thermodynamics and statistical mechanics, and gravity. Corequisite: MATH 201.

PHYS 212. Classical and Modern Physics II. 1 Credit.
TLC Tutoring Course,Offered Spring Semester Only; Lecture hours:2,Other:5
The second course in a two-course sequence that surveys major areas of physics. Topics include electricity and magnetism, light and waves, quantum mechanics, and particle physics. Prerequisites: PHYS 211 and MATH 201, or permission of the instructor.

PHYS 221. Classical Mechanics. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:3
Newtonian mechanics including conservation laws, rotational dynamics, forced damped harmonic motion, and coupled oscillations. Prerequisites: PHYS 211 and MATH 202.

PHYS 222. Wave Mechanics and Quantum Physics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Physics of coupled oscillations and waves, including classical wave equation. Wave-particle duality; origin and elementary applications of quantum mechanics; the Schroedinger wave equation; atomic and nuclear physics. Prerequisites: PHYS 212P with a minimum grade of D or PHYS 212E with a minimum grade of D.

PHYS 235. Applied Electronics. 1 Credit.
Offered Spring Semester Only; Lecture hours:2,Lab:4
Circuit fundamentals, linear and digital integrated circuits, transducers, analog to digital conversion, filtering, Fourier methods, microcomputers, and computer interfacing. Designed for science and computer science majors. Prerequisite: PHYS 212 (or PHYS 212E). Open to electrical engineering students by permission only.

PHYS 301. Astrophysics. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
An introduction to general astrophysics covering mechanics of orbiting bodies, radiation laws, stellar spectra, stellar atmospheres, the internal constitution of stars, stellar energy, galaxies, and cosmology. Prerequisites: PHYS 222 and MATH 212, or permission of the instructor. Crosslisted as ASTR 301.

PHYS 303. Modern Optics. 1 Credit.
Offered Occasionally; Lecture hours:3
Geometrical optics, interference and diffraction, and topics such as: quantum optics, optical properties of matter, lasers and holography. Prerequisite: PHYS 222 or permission of the instructor.

PHYS 310. Experimental Physics. 1 Credit.
Offered Spring Semester Only; Lecture hours:1,Other:5
Methods and techniques used in experimental and computational physics, including data analysis and numerical methods, use of standard research equipment, and documentation of laboratory work emphasizing written and oral communication of scientific results. Prerequisite: PHYS 222 or permission of the instructor.

PHYS 315. Experimental Biophysics. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:1,Other:5
Methods and techniques used in experimental and computational biophysics, including optical tweezers, microscopy, computational methods, use of standard research equipment, and documentation of laboratory work emphasizing written and oral communication of scientific results. Juniors and seniors majoring in Biophysics only.

PHYS 317. Thermodynamics and Statistical Mechanics. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
The laws of thermodynamics, thermodynamic functions, kinetic theory of gases, statistical mechanics. Prerequisites: PHYS 212 (or PHYS 212E) and either PHYS 221 or PHYS 222, or permission of the instructor.

PHYS 331. Advanced Classical Mechanics. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Kinematics and dynamics of particles, systems, and rigid bodies. Hamilton's principles, Lagrange's equations, theory of small vibrations, orbital mechanics, accelerated frames, and nonlinear dynamics. Prerequisites: PHYS 221.

PHYS 332. Quantum Mechanics. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Basic postulates and applications, perturbation theory, angular momentum, scattering theory, relativistic effects. Prerequisites: PHYS 222 and MATH 211, or permission of the instructor.

PHYS 333. Electromagnetic Theory I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Classical electromagnetic theory, including scalar and vector potentials, electrostatics, magnetostatics, time-dependent fields, and culminating with Maxwell's equations. Prerequisites: PHYS 212 (or PHYS 212E) and MATH 211. Juniors and seniors only, except by permission.

PHYS 334. Electromagnetic Theory II. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Continuation of PHYS 333. Electromagnetic waves, radiation theory, theory of relativity, and elements of plasma physics. Prerequisite: PHYS 333.

PHYS 336. Mathematical Methods in Physics. 1 Credit.
Offered Occasionally; Lecture hours:3
Topics will include two or three of the following: complex variables, special functions, tensor analysis, group theory, partial differential equations. Prerequisites: PHYS 221 and PHYS 222, MATH 212 and MATH 245, or permission of the instructor. Crosslisted as PHYS 636.

PHYS 337. Independent Study in Physics. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Independent study in areas of current interest in the physics and astronomy community. Prerequisites: permission of the department and permission of the instructor.

PHYS 338. Computer Simulations in Physics. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Introduction to the use of numerical simulations in physics. Students learn through frequent programming exercises in computer labs, and via a semester long project. The course includes scientific literature searches, data analysis, and scientific oral and written presentations. Prerequisite: PHYS 221.

PHYS 339. Advanced Quantum Mechanics and Particle Physics. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Advanced topics in quantum mechanics including applications to elementary particle physics. Prerequisite: PHYS 332, or permission of instructor.

PHYS 340. Biophysics. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Physics of cellular structures and processes, with emphasis on mechanics and thermodynamics. Juniors and seniors only. Prerequisite: PHYS 212 or PHYS 212E and either PHYS 221 or PHYS 222 or permission of the instructor.

PHYS 350. Undergraduate Research. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Undergraduate research. Prerequisite: permission of the instructor.

PHYS 3NT. Physics Non-traditional Study. 1-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:4
Non-traditional study in Physics.

Political Science

Faculty

Professors: Christopher Ellis, Michael R. James, Scott R. Meinke, Zhiqun Zhu

Associate Professors: Courtney Burns, John A. Doces, R. Douglas Hecock (Chair), David Mitchell, Christina Xydias

Assistant Professors: Katherine Bermingham, Soundarya Chidambaram, Kelly Stedem

Visiting Assistant Professor: Yongkwang Kim

Political science is the systematic study of all aspects of collective decision-making in human society. This includes questions of right and wrong, law, power and justice. Political scientists explore and analyze politics in the United States (American politics and policy), politics in other societies around the world (comparative politics), interactions and processes at the global level (international politics), and questions of political fairness (political theory).

For undergraduates, the study of political science, like other programs for the bachelor of arts degree, is intended to contribute to the acquisition of skills and knowledge that form the foundation of a liberal arts education. The study of political science provides a background for careers in public service, law, journalism, international organizations, political consulting, teaching or business.

Course Areas

Core Courses (Required for Major)		
POLS 120	Comparative Politics	1
POLS 140	American Politics	1
POLS 170	International Politics	1
POLS 210	Political Theory	1
Comparative		
POLS 211	Politics of the Developing World	1
POLS 212	Politics of India/South Asia	1
POLS 213	Gender and Politics in Comparative Perspective	1
POLS 219	Latin American Politics	1
POLS 221	Political Economy of the European Integration	1
POLS 223	European Politics	1
POLS 224	Government and Politics of the Middle East	1
POLS 225	Chinese Politics	1
POLS 226	East Asian Politics	1
American		
POLS 231	American Public Policy	1
POLS 233	The Politics of College	1
POLS 235	Media and Politics	1
POLS 236	Campaigns and Elections	1
POLS 240	The American Congress	1
POLS 242	Constitutional Law: Civil Liberties	1
POLS 243	The American Presidency	1
POLS 244	American Judicial Politics	1
POLS 246	Race Ethnicity and American Politics	1
POLS 247	Religion and Constitutional Law	1
POLS 248	Political Psychology	1
Political Theory		
POLS 252	The Ethics of Immigration	1
POLS 253	American Political Thought	1
POLS 256	Topics in Social and Political Ethics	1
POLS 257	Ethics and Public Policy	1
POLS 259	Philosophy of Race	1
POLS 260	Topics in Legal Thought	1
POLS 263	Race & Ethnicity in American Legal Thought	1
POLS 266	Nationalism	1
POLS 268	Democracy: Ideal and Reality	1
POLS 269	Feminist Political Theory	1
International		
POLS 271	American Foreign Policy	1
POLS 272	U.S. National Security Policy	1

POLS 275	Global Governance	1
POLS 276	Foreign Policy Analysis	1
POLS 277	International Political Economy	1
POLS 278	International Law	1
POLS 280	War	1
POLS 283	International Relations of East Asia	1
POLS 284	International Relations of Europe	1
POLS 286	Nonstate Actors in International Relations	1
POLS 288	French Foreign Policy Since 1945	1
Seminars		
POLS 350	Seminar in Comparative Politics	1
POLS 352	Politics of Economic Development	1
POLS 353	Comparative Ethnic Politics	1
POLS 355	Close and Contested Elections	1
POLS 356	Nationalism, Nature & the Future	1
POLS 360	Seminar in Political Theory	1
POLS 364	Justice and Public Policy	1
POLS 370	Seminar in American Politics	1
POLS 372	Polarization and American Democracy	1
POLS 373	Public Opinion	1
POLS 375	Analyzing Legislatures	1
POLS 380	Seminar in International Politics	1
POLS 382	U.S.-China Relations	1
POLS 388	Gender & International Relations	1
POLS 389	Human Rights	1
General and Cross-Subfield		
POLS 290	Topics in Politics	1
POLS 291	Environmental Politics, Policy, & Justice	1
POLS 296	Quantitative Methods	1
POLS 297	Qualitative Methods	1
POLS 396	Independent Study	.5-1
POLS 397	Honors Thesis	1

Major in Political Science

A major in political science consists of a minimum of nine courses. A core of four courses is required to provide a grounding in the traditional subfields of the discipline, so it should be taken at the outset of study in the major. One course in political science methods must be taken before the senior year. Three electives and one 300-level seminar must also be taken. Among the three electives and the one 300-level seminar, students must take courses from at least two subfields.

POLS 120	Comparative Politics	1
POLS 140	American Politics	1
POLS 170	International Politics	1
POLS 210	Political Theory	1
One course in Political Science Methods (to be taken prior to senior year)		
POLS 296	Quantitative Methods	1
or POLS 297	Qualitative Methods	
At least three electives		3
1 300-level seminar [1]		1

[1] If taken during the senior year or the second semester of the junior year, the 300-level seminar will satisfy the Culminating Experience requirement of the CASCC. Note that POLS 396 Independent Study and POLS 397 Honors Thesis are not seminars and do not fulfill the 300-level seminar requirement for the major.

In putting together their academic program, students intending to major in political science should plan to complete the core courses in each subfield before electing other 200-level courses within the same subfield. A core course may be a prerequisite for some courses. Successful completion of the appropriate core course is also a prerequisite for all seminars. In addition, permission of the seminar instructor may be required at the time of registration.

The political science department encourages study abroad and participation in other approved off-campus programs. Up to two course credits earned off campus may be used to meet the major's elective requirements. (This limit does not apply to courses offered by Bucknell-administered programs.) Students planning to undertake off-campus or nontraditional study should consult closely with their adviser. Students seeking transfer credit toward the major for an off-campus internship or other nontraditional programs must get departmental approval in advance.

Qualified juniors are invited to pursue honors in political science by writing and defending an honors thesis in their senior year. Interested juniors should consult with their adviser, the department chair or with another member of the department no later than the spring of the junior year. The University Honors Council established the basic requirements and procedures for honors theses. Interested students also may pursue independent study (POLS 396 Independent Study) under a plan worked out with a member of the department and approved by the department chair.

The College of Arts & Sciences Core Curriculum requires that all students in the College of Arts & Sciences receive instruction in writing, speaking and information literacy in their major discipline. Students majoring in political science receive instruction in these areas through the required core courses, electives and/or a seminar. The College of Arts & Sciences Core Curriculum also requires students to complete an approved Culminating Experience in the major. Political science majors will meet this requirement by taking at least one 300-level seminar in the senior year or second semester of the junior year.

Subfield coursework is distributed as follows:

American Politics

POLS 140	American Politics	1
POLS 231	American Public Policy	1
POLS 233	The Politics of College	1
POLS 236	Campaigns and Elections	1
POLS 240	The American Congress	1
POLS 242	Constitutional Law: Civil Liberties	1
POLS 243	The American Presidency	1
POLS 244	American Judicial Politics	1
POLS 246	Race Ethnicity and American Politics	1
POLS 247	Religion and Constitutional Law	1
POLS 248	Political Psychology	1
POLS 370	Seminar in American Politics	1
POLS 372	Polarization and American Democracy	1
POLS 373	Public Opinion	1
POLS 375	Analyzing Legislatures	1
POLS 235	Media and Politics	1
POLS 263	Race & Ethnicity in American Legal Thought	1
POLS 266	Nationalism	1

Comparative Politics

POLS 120	Comparative Politics	1
POLS 211	Politics of the Developing World	1
POLS 212	Politics of India/South Asia	1
POLS 213	Gender and Politics in Comparative Perspective	1
POLS 219	Latin American Politics	1
POLS 221	Political Economy of the European Integration	1
POLS 223	European Politics	1
POLS 224	Government and Politics of the Middle East	1

POLS 225	Chinese Politics	1
POLS 226	East Asian Politics	1
POLS 350	Seminar in Comparative Politics	1
POLS 352	Politics of Economic Development	1
POLS 353	Comparative Ethnic Politics	1
POLS 355	Close and Contested Elections	1
POLS 356	Nationalism, Nature & the Future	1

International Politics

POLS 170	International Politics	1
POLS 271	American Foreign Policy	1
POLS 272	U.S. National Security Policy	1
POLS 275	Global Governance	1
POLS 276	Foreign Policy Analysis	1
POLS 277	International Political Economy	1
POLS 278	International Law	1
POLS 279	Military and Politics	1
POLS 280	War	1
POLS 283	International Relations of East Asia	1
POLS 284	International Relations of Europe	1
POLS 286	Nonstate Actors in International Relations	1
POLS 288	French Foreign Policy Since 1945	1
POLS 380	Seminar in International Politics	1
POLS 382	U.S.-China Relations	1
POLS 388	Gender & International Relations	1
POLS 389	Human Rights	1

Political Theory

POLS 210	Political Theory	1
POLS 252	The Ethics of Immigration	1
POLS 253	American Political Thought	1
POLS 256	Topics in Social and Political Ethics	1
POLS 257	Ethics and Public Policy	1
POLS 259	Philosophy of Race	1
POLS 260	Topics in Legal Thought	1
POLS 263	Race & Ethnicity in American Legal Thought	1
POLS 266	Nationalism	1
POLS 268	Democracy: Ideal and Reality	1
POLS 269	Feminist Political Theory	1
POLS 360	Seminar in Political Theory	1
POLS 364	Justice and Public Policy	1

General & Cross-subfield

POLS 290	Topics in Politics	1
POLS 291	Environmental Politics, Policy, & Justice	1
POLS 296	Quantitative Methods	1
POLS 297	Qualitative Methods	1
POLS 396	Independent Study	.5-1
POLS 397	Honors Thesis	1

Minor in Political Science

The **minor** in Political Science consists of five courses.

Open-topic courses (POLS 290 Topics in Politics) may be counted toward a minor where the topics are appropriate. Off-campus and nontraditional courses in Political Science may be used as one of the non-specified courses in a minor. Credits earned in Political Science by AP or CLEP examination do not count toward a minor.

General Political Science Minor

Five courses in political science, including at least two of the following core courses: POLS 120, POLS 140, POLS 170, POLS 210.

- DLO 1: Demonstrate an understanding of fundamental political processes, institutions, behavior and ideas; and familiarity with major theories, methods and concepts in political science and its four major sub-fields.
- DLO 2: Demonstrate proficiency in thinking systematically about political interactions in national, global and international contexts.
- DLO 3: Demonstrate proficiency in thinking systematically about the ethical dimensions of politics.
- DLO 4: Write effectively, engage in intellectually grounded oral debate and form and express cogent arguments.
- DLO 5: Synthesize, analyze, and critically evaluate major arguments in the discipline, assess original and secondary sources of argumentation and evidence, and apply scholarly findings to new situations.
- DLO 6: Demonstrate continuing engagement in public affairs on local, national and/or international levels.
- DLO 7: Gain intellectual skills for graduate work and employment.

Courses

POLS 120. Comparative Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Politics and policy outside the United States; concepts for the comparison of political systems. Democracy, Third World politics, revolution, political stability and change, international effects on political processes. Not open to students who have taken POLS 205.

POLS 140. American Politics. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A critical examination of the principles, structures, and processes that shape American politics. An emphasis on political behavior and institutions with applications to contemporary political issues.

POLS 170. International Politics. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Introduction to major dynamics of international politics; the international system, decision making, perceptions, cooperation, conflict, and policy instruments, such as diplomacy and war. Analysis is linked to specific international events and issues.

POLS 1NT. Political Science Non-traditional Study. .5-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in Political Science. Prerequisite: permission of the instructor.

POLS 210. Political Theory. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Examination of the moral dimensions of politics. Authors include Plato, Aristotle, Milton, Hobbes, Locke, Rousseau, and Marx. Major concepts include justice, freedom, rights, and authority.

POLS 211. Politics of the Developing World. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the politics of low and middle-income countries in the Global South and their interactions with the rest of the world. It draws principally on the experiences of countries in Latin America, Asia, and Africa as it explores such critical topics as democracy, poverty, inequality, social movements, conflict.

POLS 212. Politics of India/South Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an introduction to the major contemporary political issues and trends in the region of India/South Asia. Themes will include colonialism, nationalism, economic growth and development, democracy vs. authoritarianism, religious fundamentalism, and ethnic conflict. Crosslisted as IREL 212.

POLS 213. Gender and Politics in Comparative Perspective. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course addresses people's gendered political, social, and economic circumstances in global perspective, with a focus on women as a group. Topics may include: theories of gender, politics, and power; intersectionality; the public / private divide; gendered political interests; gender and political candidacy; gender and leadership; etc.

POLS 219. Latin American Politics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
The dynamics of politics in Latin American social, economic, and cultural context, with use of general comparative concepts of politics.

POLS 221. Political Economy of the European Integration. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to core issues and theories related to the economic and political processes of European integration. Offered through Bucknell in London. Crosslisted as ECON 226.

POLS 223. European Politics. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Comparative analysis of institutions and policy-making in European political systems, including the European Union.

POLS 224. Government and Politics of the Middle East. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides students with an understanding of the domestic political systems of the region. More specifically, the course tries to explain the lack of democracies in the region. We examine such topics as state formation, persistence of authoritarianism, economic development, culture, Islamic challenge, and prospects for democratization.

POLS 225. Chinese Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines China's rich political history, its dynamic economic and social changes, its lasting political culture, its enduring struggle for modernization, and its evolving relations with the rest of the world. Crosslisted as EAST 269 and IREL 225.

POLS 226. East Asian Politics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course surveys political history, political institutions, economy, and society of major countries in East Asia, with focus on the continuity and changes in politics and policies of China, Japan, and Korea. Crosslisted as EAST 226 and IREL 226.

POLS 231. American Public Policy. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Course introduces students to theories of the policy-making process in America, and also provides an overview of the major policy areas in American politics.

POLS 233. The Politics of College. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of higher education policy and campus politics in the United States. Ideas to be discussed include: national- and state-level education policy, college affordability and debt, student learning and the purposes of college education, new and non-traditional models of education, and controversies surrounding the political environment on college campuses.

POLS 235. Media and Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the role of the news media in American politics. Ideas to be discussed include: the relationship between elected officials and the media, campaign advertising and media coverage of elections, and the role of the media in shaping public opinion and public policy.

POLS 236. Campaigns and Elections. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This course explains and evaluates the impact of elections on American politics. It is focused on three central objectives: improving students' understanding of the American electoral process; familiarizing students with the current electoral cycle; and improving students' ability to analyze the role of elections in American politics.

POLS 240. The American Congress. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Examination and evaluation of representative government in America. Detailed investigation of the U.S. House of Representatives and Senate. Prerequisite: POLS 140 or permission of the instructor.

POLS 242. Constitutional Law: Civil Liberties. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Examination of civil liberties policy in the U.S. through a study of U.S. Supreme Court decisions.

POLS 243. The American Presidency. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Origins and development of the presidency and an analysis of the sources and nature of executive power in American national government.

POLS 244. American Judicial Politics. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Survey of the process and substance of policymaking in the Federal court system, with an emphasis on Supreme Court decision making and on the policy impact of court decisions.

POLS 246. Race Ethnicity and American Politics. 1 Credit.
Lecture hours:3
Looks at the connections between race, ethnicity and power through various forms of political behavior including electoral, policymaking, and citizen participation. Explores mutually constitutive relationship between politics and race.

POLS 247. Religion and Constitutional Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the developing relationship between religion and American constitutional law, focusing on historic documents and Supreme Court decisions relating to the First Amendment. Crosslisted as RELI 280.

POLS 248. Political Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of the ways in which citizens form, update, and act on political preferences. Topics include: political socialization, evolutionary psychology, voting, civic participation, and social movements.

POLS 252. The Ethics of Immigration. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of opposing positions within the primary ethical debates over immigration, including the right to immigrate, a state's right to exclude, the definition of and responsibility for refugees, amnesty and sanctuary for undocumented immigrants, the right to postcolonial immigration, preferences for skilled immigrants, and the brain drain.

POLS 253. American Political Thought. 1 Credit.
Lecture hours:3
An exploration of American political thought from the colonial era to present. Readings will be drawn from the dominant political ideas of elites and popular political thought from below. Students will engage with canonical texts, as well as equally important, but historically marginalized and excluded voices of American political life.

POLS 256. Topics in Social and Political Ethics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of the types of arguments and analysis used in social and political ethics, in part through an examination of social issues.

POLS 257. Ethics and Public Policy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of competing ethical arguments regarding contentious issues in public policy, such as same-sex marriage, abortion, immigration, racial reparations, capital punishment and war.

POLS 259. Philosophy of Race. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Critical examination of the nature and meaning of "race" in terms of conceptual analysis, experience, social constructionism, feminism, class, ethnicity, politics, colonialism, violence, and redress. Crosslisted as CBST 229 and POLS 229.

POLS 260. Topics in Legal Thought. 1 Credit.
Offered Occasionally; Lecture hours:3
Subjects will vary, e.g., morality and the legal process; religion and law; contemporary jurisprudence.

POLS 263. Race & Ethnicity in American Legal Thought. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of legal theories on race and ethnicity, including race-based citizenship, affirmative action, school desegregation, busing, voting rights, racial gerrymandering, tribal sovereignty and immigration.

POLS 266. Nationalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examination of the theory and practice of nationalist movements in Europe, the United States, India and the Middle East.

POLS 268. Democracy: Ideal and Reality. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the ideal of democracy as rule of the people, the constraints facing this ideal in modern mass societies, and the prospects of realizing this ideal through radical institutional and social transformation.

POLS 269. Feminist Political Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of how various feminist ideas, commitments and critiques alter how we understand fundamental concepts and problems in political theory, such as the nature of justice, the function of political community, the foundation of rights, the definition of freedom and who is deserving of political rule. Crosslisted as WMST 269.

POLS 271. American Foreign Policy. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Analysis of American foreign policy institutions and decision-making processes; examination of the history and of current issues and problems of U.S. foreign policy.

POLS 272. U.S. National Security Policy. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
The evolution of U.S. national security policy since World War II. Topics include defense in the nuclear area, strategic doctrine, arms control, WMDs budgeting, policy making.

POLS 274. Human Rights in International Relations. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course helps students understand what human rights are, why they are violated, and what the state system can do to help stop them from being violated. Students will also explore other debates within the field, like issues with universality and the hierarchy of rights.

POLS 275. Global Governance. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course explores the rationales, processes, and institutions of multilateral governance in a globalized world. We examine the U.N. nongovernmental organizations, conflict resolution, economic development, environment, human rights, and international law. Not open to first-year students. Crosslisted as IREL 275.

POLS 276. Foreign Policy Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course is designed to introduce students to the theories that have been developed to explain foreign policy processes and foreign policy behavior. The course will also examine and discuss the foreign policies of specific international actors. Crosslisted as IREL 276.

POLS 277. International Political Economy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the politics of international economic relations including trade, finance, and development. Crosslisted as IREL 277.

POLS 278. International Law. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
The nature, historical development, and sources of international law; substantive and procedural international law and its role in international relations. Crosslisted as IREL 255.

POLS 279. Military and Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A common assumption of any state is that the military is subordinate to civilian control; however, many individuals cannot explain why that is the case. This class helps students better understand the theoretical reasons why it is considered "good" for militaries to be subordinate and what happens when subordination fails.

POLS 280. War. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course focuses on the causes of wars. Theories from many disciplines are examined in relation to interstate wars. Applying these theories to different wars, through the use of case studies, will comprise a large part of the course.

POLS 283. International Relations of East Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course offers an overview of international relations in East Asia, with focus on political, economic, and social interactions among major states in the region. Crosslisted as EAST 248 and IREL 283.

POLS 284. International Relations of Europe. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course will examine the foreign policies of European countries, individually and collectively through the European Union, toward each other, regional and global intergovernmental organizations and other regions/countries. Crosslisted as IREL 218.

POLS 286. Nonstate Actors in International Relations. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course explores the role nonstate actors (such as nongovernmental organizations, multinational corporations, violent nonstate actors, and individuals) can and do play in various substantive areas of international relations. Crosslisted as IREL 286.

POLS 288. French Foreign Policy Since 1945. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of French foreign policy, institutions, and decision-making processes in the Fourth and Fifth Republics. Current issues and problems of French foreign policy. Offered through Bucknell en France.

POLS 290. Topics in Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Attention will focus on specific thinkers, problems, concepts, or issues of recurring and continuing significance in political analysis. Topics will vary.

POLS 291. Environmental Politics, Policy, & Justice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to understanding the role of political institutions, stakeholders and policy processes (in the U.S. and internationally) in addressing environmental problems. Crosslisted as ENST 245.

POLS 296. Quantitative Methods. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to the tools used in basic quantitative political methodology. Students will learn to understand and apply a variety of statistical methods and research design that are essential for political science and public policy research.

POLS 297. Qualitative Methods. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to various qualitative methods of inquiry and research design in Political Science, such as focus groups, case studies, interview techniques, interpretive approaches, and critical argumentation.

POLS 2NT. POLS Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in Political Science. Prerequisite: permission of the instructor.

POLS 350. Seminar in Comparative Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected topics. Prerequisite: POLS 120 or POLS 205 or permission of the instructor.

POLS 352. Politics of Economic Development. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course critically engages the tools, concepts, and theories that are used to examine the politics of economic development in poorer countries. Prerequisite: POLS 120 or POLS 205 or permission of the instructor.

POLS 353. Comparative Ethnic Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines core topics and theories concerning the relationship between ethnic identity and politics using a comparative lens on cases outside of the United States. Prerequisite: POLS 120 or POLS 205.

POLS 355. Close and Contested Elections. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Course material includes the study of electoral rules worldwide, including social and political consequences of these rules. It examines the role of elections in both democratic and non-democratic systems, and then turns to a series of case studies of contemporary close and contested elections in varying contexts.

POLS 356. Nationalism, Nature & the Future. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the geographies and politics of nationalism, the ways in which nature is nationalized, the construction of nature in environmental contestations and reactions to nationalism, and the intersection of nationalism with other social constructions. Prerequisite: POLS 120 or POLS 205.

POLS 357. Petroleum Putinism & Plutonium. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the role of nationalism, alongside ideas about energy and nature, in the Russian state's current historical colonial relationships with neighboring countries, Central Asia and Indigenous communities of Siberia. Topics include Russian imperial/Soviet state extractivist economics, Russian/regional pipeline and petro politics, social resistance and climate change futures. Crosslisted as ENST 357 and RUSS 357.

POLS 360. Seminar in Political Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected topics. Prerequisite: POLS 210 or permission of the instructor.

POLS 364. Justice and Public Policy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of competing theories of justice and the application of these theories to various issues in public policy, such as taxation, welfare, health care, education, immigration, and foreign aid. Prerequisite: POLS 210 or permission of instructor.

POLS 370. Seminar in American Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Selected topics. Prerequisite: POLS 140 or permission of the instructor.

POLS 372. Polarization and American Democracy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Research-centered examination of the causes and consequences of political polarization and its implications for democracy. Prerequisite: POLS 140 or permission of the instructor.

POLS 373. Public Opinion. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
Theoretical and quantitative approaches to the study of public attitudes in the United States. Prerequisite: POLS 140 or permission of the instructor.

POLS 375. Analyzing Legislatures. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An in-depth examination of American legislative politics through empirical social-science research methods. Prerequisite: POLS 140.

POLS 380. Seminar in International Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Selected topics. Prerequisite: POLS 170 or permission of the instructor.

POLS 382. U.S.-China Relations. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Through tracing the evolution of U.S.-China relations from the 18th century to the present, this course discusses major issues and challenges between the two countries. Future trends of the relationship will also be explored. Prerequisite: POLS 170. Preference given to POLS/IREL/EAST seniors. Crosslisted as EAST 382 and IREL 482.

POLS 388. Gender & International Relations. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course helps students understand feminism as a major critical perspective to International Relations. Topics include re-understanding the formation of the state system, conflict and security, and international political economy. Prerequisite: POLS 170 or permission of the instructor.

POLS 389. Human Rights. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
The seminar will study human rights, primarily from an international perspective, including self-determination, cultural rights, ethnic and racial rights, women's rights, religious rights, and lesbian and gay rights. Open to seniors majoring in IREL or POLS, others by permission of the instructor. Crosslisted as IREL 415.

POLS 396. Independent Study. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
Open to qualified students who wish to pursue individual programs of advanced study in political science. Prerequisites: approval of a proposal submitted to the department, normally at least two weeks prior to registration and permission of the instructor.

POLS 397. Honors Thesis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
Independent research on some topic approved as honors work by the department and Honors Council. Prerequisite: permission of the instructor.

POLS 3NT. POLS Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in Political Science. Prerequisite: permission of the instructor.

Psychology

Faculty

Professors: Chris J. Boyatzis, David W. Evans, William F. Flack, Judith E. Grisel, Andrea R. Halpern (Co-chair), Kevin P. Myers, John T. Ptacek, Wendy Sternberg (Provost), T. Joel Wade

Associate Professors: Regina P. Gazes, Jasmine A. Mena (Co-chair), Aaron Mitchel, Jennifer Rice Stevenson

Assistant Professors: Stephanie Cardenas, Haley E. Kragness, Natalie Schwob, Lisa Stone-Bury

Visiting Assistant Professor: A. Nicole Winter

Adjunct Instructor: Jeffrey Wheeler

The science of psychology investigates human and animal behavior, cognition and emotion by analyzing the complex interactions among environmental, social, cultural and biological influences. Students are trained in scientific methods and different theoretical perspectives in a variety of areas of psychology: biopsychology, neuropsychology, sensation and perception, cognition, learning, child and adult development, social psychology, personality, health psychology, abnormal psychology, multicultural psychology and animal behavior. In short, psychology seeks to explain and understand how and why people and animals think and behave in the ways they do.

Through acquiring a better understanding of behavior, cognition and emotion, and scientific methods of investigation and analysis, psychology majors are well prepared to enter many fields. A major in psychology can lead to graduate study enabling a career in many areas of psychology from experimental research to clinical/counseling work. Psychology majors also pursue further education and careers in law and medicine. Psychology majors who do not pursue graduate study are well prepared for a variety of careers in the corporate and not-for-profit sectors, relying on the skills they have developed in their psychology courses, such as scientific reasoning, writing, data analysis, critical reading, writing and presentation skills.

Psychology Major

A **major** in psychology consists of 10 course credits: two courses above the 200 level, at least one of which must be taken at Bucknell. At least one of the courses above the 300 level must have been designated as meeting the Culminating Experience requirement (described below).

PSYC 100	Introduction to Psychology	1
PSYC 215	Psychological Statistics [1]	1
or MATH 216	Statistics I	
PSYC 216	Introduction to Research Methods in Psychology	1
One discipline-specific research lab. [2]		1

Four 200-level content courses. [3]	4
Two seminars above the 200 level. [4]	2
Total Credits	**10**

1. Majors should complete PSYC 215 Psychological Statistics and PSYC 216 Introduction to Research Methods in Psychology by the end of the sophomore year.
2. The discipline-specific research lab course titled "Advanced Methods in _____" may be taken only after having completed PSYC 215 Psychological Statistics and PSYC 216 Introduction to Research Methods in Psychology.
3. The courses in the 200-level clusters are designed to be foundational and, taken together, provide exposure to critical content areas and perspectives in the field. Thus, at least one course must come from each of the *Brain and Behavior*, *Cognition and Learning*, and *Person and the Group* clusters. The fourth course may come from any of these clusters or may come from the *Psychological Breadth* cluster. Ideally, all 200-level requirements should be completed by the end of the junior year. The optimal scheduling of these courses should be determined in consultation with a member of the department, and is especially important for students who enter the major late, hope to study abroad, or have strong preferences among alternative courses.
4. At least one course must be taken at Bucknell. Majors **may not** use PSYC 329 Undergraduate Research or PSYC 360 Honors Thesis to satisfy this requirement. One of these 300-level seminars may be designated as meeting the Culminating Experience requirement. PSYC 350 Culminating Research Experience+ taken in a student's final three semesters may fulfill one of the 300-level seminar requirements AND the Culminating Experience requirement.

Brain and Behavior

PSYC 248	Developmental Psychobiology	1
PSYC 250	Biopsychology	1
PSYC 252	Sensation and Perception	1
PSYC/ANBE 266	Animal Behavior	1

Cognition and Learning

PSYC 203	Learning	1
PSYC 204	Human Cognition	1
PSYC 237	Introduction to Language Development	1

Person and the Group

PSYC 207	Developmental Psychology	1
PSYC 209	Social Psychology	1
PSYC 210	Psychopathology	1
PSYC 240	Critical Multicultural Psychology	1

Psychological Breadth

PSYC/NEUR 217	Psychopharmacology	1
PSYC 228	Personality Psychology	1
PSYC 230	Critical Community Psychology	1
PSYC 234	Introduction to Sport Psychology	1
PSYC 239	Environmental Psychology	1

Or additional psychology courses with departmental approval — often taken abroad.

Psychology majors satisfy the requirements of the College of Arts & Sciences Core Curriculum for writing, information literacy and presentation skills through their discipline-specific advanced methods course. In the context of psychological research, each of these courses provides formal training in writing, library and information research, and presentation skills. Frequent instruction and practice in writing, information search and presentation skills are also provided in a variety of additional courses at all levels of the major. (See Meeting the CASCC requirements for specific information.)

To complete the Culminating Experience requirements of the College of Arts & Sciences Core Curriculum, students select one of their 300-level seminars from a list of those identified by the department as drawing from and integrating an especially broad variety of perspectives and research areas of psychology. Alternatively, students who are academically eligible to participate in the Honors Program in their senior year may undertake an original research project leading to a written honors thesis. Successful completion of an honors thesis requirement defined by the University Honors Council fulfills the Culminating Experience requirement. PSYC 329 Undergraduate Research taken in a student's final three semesters may also count toward the Culminating Experience requirement. (See Meeting the CASCC requirements below for specific information.)

The department strongly encourages students to engage in independent research in close collaboration with a faculty member, either on a volunteer basis or for academic credit. This is excellent preparation for graduate study and an exciting way for students to apply the skills they learn in their coursework by engaging intellectually in the process of discovery in psychology. Seniors, if academically eligible, often conduct senior honors projects and many others conduct independent studies at the 200 level or the 300 level. Students who are engaged in 300-level independent study AND enroll in PSYC 350 Culminating Research Experience+ in their final three semesters may use this experience as one of their 300-level requirements AND a Culminating Experience.

Meeting the CASCC Requirements

Writing Within the Major

Psychology majors may satisfy the writing in the major requirement by taking:

Select one of the following:

PSYC 100	Introduction to Psychology
200-level psychology courses that are not applied research methods seminars	
Applied Research Methods Seminars	
300-level psychology courses	

Formal Presentation Experience

Psychology majors may satisfy the formal presentation experience requirement by taking applied research methods seminars, or:

PSYC 305	Neurodevelopmental Disorders	1
PSYC 307	Culture and Child Development	1
PSYC 309	Appetite and Eating Behavior	1
PSYC 318	Cognitive Aging	1
PSYC 325	Personality, Psychopaths, and Serial Killers	1
PSYC 339	Psychology of Music	1
PSYC 350	Culminating Research Experience+	1
PSYC 352	Face Perception	1
PSYC 370	Primatology	1

Additionally, psychology majors may fulfill this requirement by completing an honors thesis.

Information Literacy

Psychology majors may fulfill this requirement by taking: an applied research methods seminar, 200-level psychology courses, 300-level psychology courses, or by completing an honors thesis or an independent study.

Culminating Experience

Select one of the following 300-level psychology seminars to be taken during the final three semesters: [6]

PSYC 300	Infancy	1
PSYC 303	Critical Psychologies	1
PSYC 305	Neurodevelopmental Disorders	1
PSYC 306	Critical Trauma Psychology	1
PSYC 307	Culture and Child Development	1
PSYC 309	Appetite and Eating Behavior	1
PSYC 312	Biopsychology of Appetite and Obesity	1
PSYC 313	Researching Behavioral Neuroscience	1
PSYC 320	Children's Studies	1
PSYC/NEUR 321	Neuroethics	1
PSYC 325	Personality, Psychopaths, and Serial Killers	1
PSYC 338	Bucknell in Italy: Childhood, Family & Education in Italy	1
PSYC 339	Psychology of Music	1
PSYC 341	Neurophysiology of Wellbeing	1
PSYC 349	Cognitive Neuroscience	1
PSYC 350	Culminating Research Experience+ [7]	1
PSYC 352	Face Perception	1
PSYC 360	Honors Thesis	1
PSYC 368	Social Neuroscience	1

PSYC 369	Psychology of Beauty and Attraction	1
PSYC 370	Primatology	1
PSYC 372	Comparative Cognition	1
PSYC 374	Latinx Psychology	1

[6] Each seminar on this list meets one or more of the following requirements: 1) involves an independent and original work of psychological research; 2) includes a service-learning experience; 3) results in the creation and delivery of applications and proposals based on psychological knowledge for the benefit of the community; or 4) culminates in a major paper that synthesizes psychological knowledge. Completing PSYC 329 Undergraduate Research that meets one of the four requirements just listed, or an honors thesis, may also be used to fulfill this requirement.

[7] Students who are engaged in independent study AND enroll in PSYC 350 Culminating Research Experience+ in their final three semesters may use this experience as one of their 300-level seminar requirements AND a Culminating Experience.

Minors in Psychology

Two **minors** are offered in psychology.

Cognitive and Perceptual Sciences Minor

This minor concentrates on how we take information from the external world and use it to construct our mental world. This minor can be completed in two ways depending on whether or not a student has completed PSYC 100 Introduction to Psychology.

1. For students who take PSYC 100 Introduction to Psychology, the minor consists of:

PSYC 100	Introduction to Psychology	1
PSYC 215	Psychological Statistics (or equivalent)	1
PSYC 204	Human Cognition	1
PSYC 252	Sensation and Perception	1
PSYC 292	Research Methods in Sensation and Perception	1
or PSYC 294	Research Methods in Human Cognition	
PSYC 318	Cognitive Aging	1
or PSYC 352	Face Perception	

2. For students who do not take PSYC 100 Introduction to Psychology, the minor consists of:

PSYC 215	Psychological Statistics (or equivalent)	1
PSYC 204	Human Cognition	1
PSYC 252	Sensation and Perception	1
PSYC 292	Research Methods in Sensation and Perception	1
or PSYC 294	Research Methods in Human Cognition	
PSYC 318	Cognitive Aging [5]	1
PSYC 352	Face Perception	1

[5] With the approval of the department chair, a research project in cognition or perception (PSYC 329 Undergraduate Research, PSYC 360 Honors Thesis) could be substituted for either PSYC 318 Cognitive Aging or PSYC 352 Face Perception for those students who do not take PSYC 100 Introduction to Psychology.

Neuropsychology Minor

The neuropsychology minor allows exploration of the brain and its relation to behavior. It requires six courses.

PSYC 100	Introduction to Psychology	1
PSYC 204	Human Cognition	1
PSYC 215	Psychological Statistics (or equivalent)	1
PSYC 250	Biopsychology	1
PSYC 349	Cognitive Neuroscience	1
Select one of the following: [6]		1
PSYC 252	Sensation and Perception	
PSYC 305	Neurodevelopmental Disorders	
PSYC 318	Cognitive Aging	

PSYC 339	Psychology of Music
PSYC 352	Face Perception

[6] With the approval of the department chair, independent research in neuropsychology (PSYC 329 Undergraduate Research, PSYC 360 Honors Thesis) may be used to satisfy this last requirement.

Nonmajors are encouraged to discuss sequences of courses appropriate to their academic goals with any member of the department.

Mission Statement

The Department of Psychology fosters a community of scholars committed to exploring, producing, sharing, and applying knowledge in psychology. We acknowledge our discipline's role in contributing to oppression and seek to promote equity and justice through teaching, research, and service. We value open and critical thought and action, conducted in an ethical, inclusive, and compassionate manner.

Learning Goals

1. Students will acquire a breadth of knowledge in psychology.
2. Students will critically evaluate psychological knowledge and its applications.
3. Students will employ ethical standards in research, practice, and academic contexts.
4. Students will demonstrate competencies in written, oral, and interpersonal communication and collaboration.
5. Students will understand the role of psychology in improving lives and strengthening communities.

Courses

PSYC 100. Introduction to Psychology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:2
A survey of concepts, principles, and theories of an empirical science of cognition, affect, and behavior and its application.

PSYC 116. Statistic Literacy for 21st Century. 1 Credit.
Offered Summer Session Only; Lecture hours:6
An investigation of the concepts and the reasoning underlying the interpretation of statistical information. Emphasis is on the basic methods for gathering trustworthy data and the elementary graphical and numerical techniques for analyzing it. Open to students enrolled in the BCCSP program only.

PSYC 133. Black Psychology. 1 Credit.
Offered Occasionally; Lecture hours:4
Black self-concept, the black family and self-awareness, "black English", skin color and physical attractiveness standards, black self-esteem, black views on prejudice and discrimination. Open to BCCSP students only.

PSYC 169. Psychology of Attraction and Relations. 1 Credit.
Offered Summer Session Only; Lecture hours:6
Examination of how biology influences: what our mate preferences are and where they come from, the correlates of beauty, relationship initiation and maintenance, love, jealousy and mate expulsion. Prerequisite: permission of the instructor. Open to BCCSP students only.

PSYC 1NT. Psychology Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in psychology. Prerequisite: permission of the instructor.

PSYC 203. Learning. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
The study of basic mechanisms of associative learning in motivated behavior, especially Pavlovian and operant conditioning in the behaviors of various species. Prerequisite: PSYC 100 or ANBE 266 or BIOL 266 or PSYC 266 or permission of the instructor.

PSYC 204. Human Cognition. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A survey of the theories and methods employed in studying human mental abilities. Issues include attention, memory, language, problem solving, and decision making. Prerequisite: PSYC 100 or permission of the instructor.

PSYC 207. Developmental Psychology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Study of stages, sequences and processes in normal child development, prenatal through childhood. Emphasis on interaction of nature and nurture in cognitive, social emotional development. Volunteer work component to course. Prerequisite: PSYC 100. EDUC 102 or EDUC 201 accepted as an alternate prerequisite for EDUC BS majors or instructor permission.

PSYC 209. Social Psychology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Theories of social influence and social interaction, their empirical foundations and implications for the individual and society. Prerequisite: PSYC 100 or permission of the instructor.

PSYC 210. Psychopathology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Covers theories and research on psychological disorders. Emphasis is on empirically based approaches to psychopathology including (but not limited to) developmental, cognitive and neuroscientific approaches. Prerequisite: PSYC 100 or permission of the instructor.

PSYC 215. Psychological Statistics. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
An introduction to basic statistical analyses in psychology.

PSYC 216. Introduction to Research Methods in Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:2,Other:1
An introduction to the methods used and issues faced by psychological researchers. Topics include ethics, study design (true-experimental, correlational, and quasi-experimental), data collection and analysis, and communication of empirical findings. A foundation for other research-based courses in Psychology. Prerequisites: PSYC 100 and PSYC 215 or MATH 216.

PSYC 217. Psychopharmacology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Psychopharmacology, the study of drugs that affect behavior, begins with an appreciation for neurochemical, pharmacological and behavioral principles in order to understand actions and effects of therapeutic compounds and addictive substances, the two major categories of psychopharmacological drugs. Prerequisite: PSYC 100 or permission of the instructor. Crosslisted as NEUR 217.

PSYC 228. Personality Psychology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Evaluation of theory and research on personality, including consideration of classic theories and their applications in current research. Prerequisite: PSYC 100 or permission of the instructor.

PSYC 229. Directed Study in Psychology. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
An entry into psychological research or other independent study directed by a faculty member. Experiences might include library work, collecting data, entering and analyzing data, and other activities associated with engagement in research and in faculty-directed inquiry. Prerequisite: PSYC 100 and instructor permission.

PSYC 230. Critical Community Psychology. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3
Critical community psychology is about understanding and changing social factors to promote health and empowerment. This W2 service-learning course is focused on a critical approach to the field. Prerequisite: PSYC 100.

PSYC 234. Introduction to Sport Psychology. 1 Credit.
Offered Occasionally; Lecture hours:3
Considers the individual difference factors influencing athletic performance (e.g., cognitive, behavioral, and emotion). Also considers psychological processes operating in groups (e.g., cohesion, leadership, aggression and audience effects).

PSYC 237. Introduction to Language Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Survey of the mechanisms involved in language development. Topics include the stages in language development, theoretical approaches to language development, the biological bases of language, and atypical language development. Prerequisite: PSYC 100, or LING 105, or LING 110, or LING 230. Crosslisted as LING 237.

PSYC 239. Environmental Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the connections between environments (natural and built) and human psychological, emotional, cognitive, and behavioral experiences.

PSYC 240. Critical Multicultural Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of multiculturalism as a major paradigm in psychology. Analysis of multicultural principles, concepts, and sociocultural factors and their impact on assessment, practice, and research. Course topics include an exploration of diverse worldviews, communication styles, identity development, acculturation, stereotyping, prejudice, discrimination, structural oppression, and the development of cultural competence.

PSYC 248. Developmental Psychobiology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Addresses development in humans from conception through adolescence with some comparative analysis with non-humans. Emphasis on both normal and atypical cognitive, neuropsychological and neurobiological development. Prerequisite: PSYC 100 Crosslisted as NEUR 248.

PSYC 250. Biopsychology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Biological bases of behavior and their relationship to motivation, learning and perception. Prerequisite: PSYC 100 or BIOL 203 or BIOL 204 or ANBE/BIOL/PSYC 266 or permission of the instructor.

PSYC 252. Sensation and Perception. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Anatomy and functions of the sensory systems: vision, audition, kinesthesis, vestibular sensation, taste and smell, with emphasis on theory and abnormalities of the human sensory systems. Prerequisite: PSYC 100 or permission of the instructor.

PSYC 266. Animal Behavior. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A survey of important theories, issues, and empirical techniques in the interdisciplinary field of animal behavior, emphasizing both proximate and ultimate explanations for behavior. Crosslisted as ANBE 266 and BIOL 266.

PSYC 285. Advanced Methods in Critical Community Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Laboratory and/or field research on community psychology and social justice. Prerequisites: PSYC 100, PSYC 215 or MATH 216, and PSYC 216.

PSYC 286. Advanced Methods Developmental Psychobiology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
This course introduces students to various research methods and approaches relevant to the study of developmental psychopathology, including children with neurodevelopmental and neuropsychiatric disorders. Prerequisites: PSYC 100 and PSYC 216 and (PSYC 215 or MATH 216) and (PSYC 210 or concurrent enrollment or PSYC 248 or concurrent enrollment).

PSYC 287. Advanced Methods in Critical Multicultural Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
An introduction to research methods in critical multicultural psychology designed to understand the influence of culture and context on the physical and mental health of historically marginalized diverse populations. Students will use qualitative, quantitative, and mixed methods to examine health disparities involving unfair social, economic, and/or environmental disadvantages.

PSYC 288. Advanced Methods in Language. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Research methods in language; especially development and acquisition in infants and toddlers. Prerequisites: PSYC 215 or MATH 216 and PSYC 216 or PSYC 100.

PSYC 290. Advanced Methods in Biopsychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Laboratory research to in principles of Biopsychology. Prerequisites: PSYC 215 or MATH 216 and PSYC 216 or ANBE 296, and prerequisite or corequisite PSYC 250 or NEUR 254, or permission of the instructor.

PSYC 291. Advanced Methods in Abnormal Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Laboratory research methods course in abnormal and clinical psychology or psychopathology. Prerequisites: PSYC 100 and PSYC 216 and (MATH 216 or PSYC 215) and (PSYC 210 or PSYC 213 or PSYC 248).

PSYC 292. Advanced Methods in Sensation and Perception. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Laboratory and/or field research to accompany PSYC 252 Sensation and Perception. Prerequisites: PSYC 216 and (PSYC 215 or MATH 216).

PSYC 293. Advanced Methods in Learning. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; May require dissection or live animal experimentation
Laboratory and/or field research to accompany PSYC 203 Learning. Prerequisites: (PSYC 215 or MATH 216), (PSYC 216 or PSYC/ANBE 296), and PSYC 203.

PSYC 294. Advanced Methods in Human Cognition. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Laboratory to accompany PSYC 204 Human Cognition. Prerequisites: PSYC 216 and (PSYC 215 or MATH 216) and (PSYC 204 or concurrent enrollment or PSYC 252 or concurrent enrollment) or permission of the instructor.

PSYC 296. Advanced Methods in Animal Behavior. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Laboratory and/or field research to accompany ANBE 266, BIOL 266, or PSYC 266. Prerequisites: (PSYC 215 or MATH 216) and (BIOL 201 or BIOL 202 or BIOL 203 or BIOL 204 or PSYC 216) and (ANBE 266 or BIOL 266 or PSYC 266 or concurrent enrollment). Crosslisted as ANBE 296.

PSYC 297. Advanced Methods in Developmental Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Students conduct observational research of children's behavior. Prerequisites: PSYC 100 and (PSYC 215 or MATH 216) and PSYC 216 and any PSYC 200-level course.

PSYC 299. Advanced Methods in Social Psychology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3
Laboratory-based research on topics in social psychology. Prerequisites: PSYC 100, PSYC 209, (PSYC 215 or MATH 216), and PSYC 216.

PSYC 2NT. Psychology Non-traditional Study. .5-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study in psychology. Prerequisite: permission of the instructor.

PSYC 300. Infancy. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Advanced seminar on human infancy as viewed from cognitive, developmental, and evolutionary psychology. Includes implications for infant survival and early education. Prerequisites: PSYC 204 or PSYC 207 or PSYC 248 or PSYC 252 or PSYC 266 and permission of the instructor. Crosslisted as PSYC 600.

PSYC 302. Cognitive Development. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Advanced seminar on how our cognitive system changes from the prenatal period to adolescence. Focuses on selected topics in the development of attention, memory, language, and concepts. Includes implications for education in formal and informal settings. Prerequisite: PSYC 204 or PSYC 207.

PSYC 303. Critical Psychologies. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Critical psychologies (e.g., critical liberation, radical) are progressive alternatives to mainstream psychology, emphasizing untoward consequences of the mainstream focus on the individual. Prerequisite: PSYC 100 or permission of the instructor. A community-engaged practicum is part of the course. Crosslisted as PSYC 603.

PSYC 305. Neurodevelopmental Disorders. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examines the genomic, neural, and environmental bases that underlie the development of children with developmental disabilities, including autism spectrum disorders, intellectual disabilities, and specific genetic/genomic syndromes. Takes a developmental psychopathology perspective, highlighting the reciprocal nature of the study of typical and atypical development. Prerequisites: NEUR 248/PSYC 248 and instructor permission. Crosslisted as NEUR 305 and PSYC 605.

PSYC 306. Critical Trauma Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course is a community-engaged seminar on psychological trauma, posttraumatic stress and the contexts in which people become traumatized. Prerequisite: PSYC 100 or permission of the instructor. Crosslisted as PSYC 606.

PSYC 307. Culture and Child Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of culture-specific and universal processes in child development in diverse societies. Focus on cultural influences on social, emotional, and cognitive development, and on parenting, family, and education contexts and practices. Prerequisite: PSYC 207 or permission of the instructor. Crosslisted as PSYC 607.

PSYC 309. Appetite and Eating Behavior. 1 Credit.
Offered Occasionally; Lecture hours:3
Advanced seminar considering psychological factors involved in appetite, food preferences, and food intake. Prerequisite: PSYC 203. Crosslisted as PSYC 609.

PSYC 312. Biopsychology of Appetite and Obesity. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Reading and discussion of scholarly research on the neural, physiological, and endocrine signals that influence the psychology of appetite, food reward, eating behavior, and obesity in humans and animal models. Prerequisite: PSYC 250 or NEUR 254. Crosslisted as NEUR 312 and PSYC 612.

PSYC 313. Researching Behavioral Neuroscience. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Following a general orientation to behavioral genetics and pharmacology using mice, we will conduct group experiments. Each student will then develop and conduct an independent research project. Prerequisites: PSYC 215 or MATH 216 and PSYC 250 or NEUR 254 or an applied research methods course and permission of instructor. Crosslisted as NEUR 313 and NEUR 613 and PSYC 613.

PSYC 314. Cognitive Development Research. 1 Credit.
Offered Occasionally; Lecture hours:3
Advanced seminar examining how very young children understand words. Students conduct collaborative research projects culminating in oral and written reports. Prerequisites: PSYC 204 or PSYC 207 or PSYC 288 or LING 230 and permission of the instructor.

PSYC 318. Cognitive Aging. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Seminar discussing the development and changes in cognition in senior citizens. Topics include memory, language, attention, and decision-making. Prerequisite: PSYC 252 or PSYC 204 and permission of the instructor. Crosslisted as PSYC 618.

PSYC 319. Topics in Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Occasional seminars on selected topics of current interest in psychology. Prerequisite: permission of the instructor. Crosslisted as PSYC 619.

PSYC 320. Children's Studies. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:Varies
Critical examination of childhood from multiple disciplinary lenses. Topics include child labor, child soldiers, children's spirituality, children in diverse cultures, children the arts, and social class and race as influences in children's lives. In this service-learning course students work with children/youth in field placements. Open to Seniors by permission. Crosslisted as PSYC 620.

PSYC 321. Neuroethics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will consider ethical, moral, legal and social implications that come from a growing ability to understand, predict and change human behavior. In a seminar format we'll consider right and wrong use of neuroscientific knowledge in clinical settings, law and criminal justice, national defense, economics, business and education. Crosslisted as NEUR 321 and PSYC 621.

PSYC 324. Advanced Psychological Statistics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of advanced statistical techniques with emphasis on analysis and interpretation of experimental and correlational data. Prerequisites: PSYC 215 or equivalent and permission of the instructor. Crosslisted as PSYC 624.

PSYC 325. Personality, Psychopaths, and Serial Killers. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Considers personality disorders with a focus on psychopathy and serial murders. Biological and environmental causes of psychopathy are considered as well as the developmental course of the condition and ethics of treatment. Prerequisite: PSYC 228 or PSYC 209 or PSYC 210 or permission of the instructor. Crosslisted as PSYC 625.

PSYC 328. Undergraduate Research II. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:3; Repeatable
Research or other independent study with a faculty member outside of the psychology department. Research topics may be posed by students or faculty. Cannot be counted toward the psychology major. Prerequisites: permission of the supervisor, Psychology Chair approval and permission of the instructor.

PSYC 329. Undergraduate Research. .5-1 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies,Other:3; Repeatable
Research or other independent study on any aspect of psychology. Research topics may be posed by students or faculty. Prerequisite: permission of the instructor.

PSYC 331. Geropsychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Advanced seminar exploring biological, psychological and social changes in older adulthood. Topics include mental health and aging, psychopathology across the lifespan, coping with and managing chronic and acute illnesses, grief and loss, family caregiving, dementia and Alzheimer's Disease, and end-of-life experiences. Crosslisted as PSYC 631.

PSYC 338. Bucknell in Italy: Childhood, Family & Education in Italy. 1 Credit.
Offered Summer Session Only; Lecture hours:3
In this 1-credit, 4-week study abroad experience you will learn about childhood in Italy with an emphasis on the family and education systems in Italy. Not open to seniors. Crosslisted as EDUC 338.

PSYC 339. Psychology of Music. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Seminar examining how musicians and non-musicians comprehend, remember, perform, and respond to music, including developmental aspects. Some background in music required. Prerequisites: PSYC 204 or PSYC 252 and permission of the instructor. Crosslisted as PSYC 639.

PSYC 341. Neurophysiology of Wellbeing. 1 Credit.
Offered Occasionally; Lecture hours:3,Recitation:1
We will investigate the neurophysiological systems involved in wellbeing and stress including the autonomic nervous system, the gut-brain axis, and the endocrine system. For this investigation, we will read, analyze, and discuss primary and secondary literature on these topics. Crosslisted as NEUR 310 and PSYC 641.

PSYC 344. Developmental Brain Research. 1 Credit.
Offered Spring Semester Only; Lecture hours:3; Repeatable
Students learn a variety of assessment techniques in developmental neuropsychology and neuroscience (including EEG) and conduct quantitative research culminating in written and oral reports. Crosslisted as PSYC 644 and NEUR 344 and NEUR 644. Prerequisite: permission of the instructor.

PSYC 349. Cognitive Neuroscience. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Brain mechanisms of language, memory, perception, emotion, and other higher-order processes, as revealed by studies of task-related human brain activity or neural pathology. Prerequisites: PSYC 204 or PSYC 250 or PSYC 252 or NEUR 254 and permission of the instructor. Crosslisted as PSYC 649.

PSYC 350. Culminating Research Experience+. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This seminar, worth 1 credit, turns a research project into a Culminating Experience. Covers research, ethics, proposal writing, public speaking, data presentation, and other professional issues. Course meets only 1 hour a week most weeks. Students should not register for PSYC 329 or PSYC 360. Prerequisite: permission of the instructor.

PSYC 352. Face Perception. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Advanced seminar in face perception, including issues of holism, uniqueness, language, emotion, and race. Prerequisites: (LING 237 or NEUR 254 or PSYC 204 or PSYC 237 or PSYC 252) and permission of the instructor. Crosslisted as PSYC 652.

PSYC 359. Psychology and Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course compares the law's informal theories of human behavior with what social, cognitive, developmental and personality psychologists know based on empirical studies. Topics include policing, interrogations, false confessions and guilty pleas, forensic evidence, deception detection, eyewitness identifications, alibi generation and corroboration, repressed memories and jury selection and decision-making. Crosslisted as PSYC 659.

PSYC 360. Honors Thesis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Prerequisites: permission of the department and permission of the instructor.

PSYC 368. Social Neuroscience. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Study of the brain basis of social behaviors such as bonding and attachment, parental behavior, play, social cognition, and the benefits of social support. We will investigate what is known about social function in the brains of species that have evolved to be social species, including humans. Crosslisted as NEUR 368 and PSYC 668.

PSYC 369. Psychology of Beauty and Attraction. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examination of research on beauty and attraction from an evolutionary perspective. Prerequisites: PSYC 209 and PSYC 216 or PSYC 299, and permission of the instructor. Crosslisted as PSYC 669.

PSYC 370. Primatology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; May require dissection or live animal experimentation
Introduction to research on prosimians, monkeys and apes with emphasis on the evolutionary origin of diversity, habitat use, social structure, social behavior, cognitive abilities and management. Prerequisites: (ANBE 266 or BIOL 266 or PSYC 266) or (BIOL 203 and BIOL 204) and permission of the instructor. Crosslisted as ANBE 370 and ANBE 670 and BIOL 370 and BIOL 670 and PSYC 670.

PSYC 371. Primate Minds. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
An investigation into the cognitive abilities and capacities of nonhuman primates emphasizing a comparative perspective. Prerequisites: PSYC 216 or (ANBE 296 or PSYC 296) or permission of the instructor. Crosslisted as ANBE 371, ANBE 671 and PSYC 671.

PSYC 372. Comparative Cognition. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:3
Advanced seminar exploring cognition and behavior from evolutionary and comparative perspectives. Topics will include social behavior, memory, communication, spatial cognition, learning, and meta-cognition. Prerequisite: (ANBE 266 or BIOL 266 or PSYC 266) or (PSYC 203 or PSYC 204). Crosslisted as PSYC 672 and ANBE 372 and ANBE 672.

PSYC 374. Latinx Psychology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A seminar that examines the psychological research literature related to Latinxs in the U.S. It considers the influences of Latinx cultural values, practices, contexts and experiences on physical and mental health outcomes. Open to juniors seniors only or by permission of the instructor. Crosslisted as LAMS 374 and PSYC 674.

PSYC 3NT. Psychology Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies
Non-traditional study course in psychology. Prerequisite: permission of the instructor.

Public Policy Minor

Faculty

Director: Matías Vernengo

Steering Committee: Soundarya Chidambaram, John A. Doces, Elizabeth Durden, Christopher Ellis, Abe N. Feuerstein, Tom G. Geurts, R. Douglas Hecock, Michael R. James, Janet T. Knoedler, James G. Lawson, Carl Shu-Ming Lin, Christopher S. P. Magee, Scott R. Meinke, Geoffrey E. Schneider, Deborah L. Sills, Kelly Stedem, Matías Vernengo, Amy M. Wolaver, Amanda Wooden

Public policy can be defined as a set of actions, agreements, laws, regulations implemented at all levels of government, often in consultation with civil society, to address socioeconomic issues and to deal with the provision of public goods with the objective of improving social welfare. The minor in public policy is designed to give Bucknell students from a variety of academic majors the additional analytical and theoretical skills to supplement their academic majors and to participate knowledgeably and effectively in the public arena after they leave Bucknell, whether as policymakers or as engaged citizens.

The gateway course UNIV 225 Introduction to Public Policy is an introductory course that incorporates public policy theories and topics in an interdisciplinary fashion. The methods requirement ensures that students have exposure to more than one social science research discipline. Elective courses offered in various disciplines give students the opportunity to apply the basic theoretical and analytical tools to specific areas of public policy. These courses prepare students completing the minor for graduate programs in public policy and other social science disciplines, as well as for fruitful careers in government and industry.

The minor consists of an introductory course, a social science research methods course, and three electives from the list below. If the student has fulfilled the methods requirement in their major, the minor consists of the introductory course and four of the elective courses. Sociology majors wishing to fulfill the public policy minor may count SOCI 208 Methods of Social Research or SOCI 209 Analyzing the Social World as their methods requirement, but these courses are not open to non-majors. Students must distribute their electives in the following way:

- For depth, they must take exactly two electives from a single department; and,
- For breadth, the third (and fourth, if applicable) elective must be taken from a different department.
- None of the electives may be in the same discipline as the student's major.

Core Course [1]		
UNIV 225	Introduction to Public Policy	1
Methods Course in Social Sciences		
Select one of the following:		1
ANTH 201	Field Research in Local Communities	
ECON 241	Econometrics	
EDUC 362	Quantitative Research Methods	
EDUC 364	Qualitative Research Methods	
POLS 296	Quantitative Methods	
POLS 297	Qualitative Methods	
PSYC 285	Advanced Methods in Critical Community Psychology	
PSYC 287	Advanced Methods in Critical Multicultural Psychology	
PSYC 291	Advanced Methods in Abnormal Psychology	
PSYC 297	Advanced Methods in Developmental Psychology	
PSYC 299	Advanced Methods in Social Psychology	
SOCI 201	Field Research in Local Communities	
UNIV 140	Introduction to Social Science Research Methods	
Electives in Different Disciplines [2]		
Select three of the following:		3
ACFM 324	Individual Federal Income Taxes	
ANTH 202	Rainforests and Eco-Politics in Latin America	
ANTH 251	Gender, Power and Global Development	
ANTH 260	Environmental Anthropology	
ANTH 267	Anthropology of Tourism	
CEEG 432	Sustainable Transportation Planning	
ECON 101	Economic Principles/Problems	
ECON 203	Intermediate Macroeconomics	

ECON 210	Introduction to Behavioral Economics
ECON 231	Economics of Climate Change
ECON 237	Health Politics and Health Policy
ECON 280	Political Economy of Media and Advertising
ECON 311	Labor Economics
ECON 313	Public Economics
ECON 328	Money and Financial Institutions
ECON 337	International Monetary and Financial Economics
ECON 405	Comparative Economic Systems
ECON 412	Health Economics
EDUC 101	Diversity, Equity and the Foundations of American Education
EDUC 227	Immigrant Youth in U.S. Society
EDUC 232	Remaking Public Education
EDUC 350	Higher Education in the United States
ENST 209	Rainforests and Eco-Politics in Latin America
ENST 215	Environmental Planning
ENST 226	Water & Power
ENST 245	Environmental Politics, Policy, & Justice
ENST 255	Environmental Injustice and Activism
ENST 355	Advanced Topics in Environmental Policy
GEOG 216	Borders and Politics of Mobility
GEOG 234	Human Ecology
GEOG 257	Climate Change
GEOG 345	Food and the Environment
HIST 274	Africa and International Relations in Historical Perspective
HIST 374	Human Trafficking: Ancient to Present Day
IREL 229	Middle East Conflict and Revolution
IREL 240	Human Security
IREL 252	Political Economy of Global Resources
IREL 275	Global Governance
IREL 276	Foreign Policy Analysis
LAMS 202	Rainforests and Eco-Politics in Latin America
POLS 140	American Politics
POLS 231	American Public Policy
POLS 240	The American Congress
POLS 248	Political Psychology
POLS 257	Ethics and Public Policy
POLS 263	Race & Ethnicity in American Legal Thought
POLS 271	American Foreign Policy
POLS 272	U.S. National Security Policy
POLS 364	Justice and Public Policy
PSYC 230	Critical Community Psychology
PSYC 240	Critical Multicultural Psychology
SOCI 247	Class and Politics in the US
UNIV 200	Integrated Perspectives Course (Climate Change, Science and Policy)
WMST 251	Gender, Power and Global Development
WMST 332	Women & the Penal System

1 Students may substitute the main anchor course, Introduction to Public Policy (UNIV 225), with American Public Policy (POLS 231).

2 Other courses may count as a public policy elective with the approval of the coordinator.

Race & Ethnicity Studies Minor

Faculty

Coordinating Committee: Cymone Fourshey, Susan A. Reed

The minor in race & ethnicity studies takes an interdisciplinary approach to the study of race and ethnicity. What do these categories of difference mean? How have they been defined, constructed and applied in different historical and socio-cultural contexts? How do they intersect or overlap with other aspects of difference (e.g., gender, class, nation, sexuality, religion)? Exploring these questions with analytical tools and approaches developed in a range of academic disciplines, the minor leads to a critical examination of the construction of race and ethnicity in a variety of social, cultural, historical, political and economic contexts.

The minor consists of five courses to be taken from three categories:

Course from any of the three categories		1
Race & Ethnicity Core Requirement		
Select at least one of the following:		1
ENLS 203	Introduction to Race and Literature (Queerness and Race)	
ENLS 203	Introduction to Race and Literature (Reading Race in Time Travel)	
ENLS 320	Race & Gender in the 18th Century	
HIST 219	American Abolition (Slavery)	
HIST 319	African-American History (Terror and the Black Struggle)	
PHIL 229	Philosophy and Race	
POLS 263	Race & Ethnicity in American Legal Thought	
POLS 353	Comparative Ethnic Politics	
SOCI 243	Sociology of Race and Ethnicity	
WMST/CBST 227	Race and Sexuality	
Comparative/Theoretical		
Select at least one course from the list of approved comparative/theoretical courses. [1]		1
ECON 402	Economics of Inequality	
EDUC 318	Critical Multiculturalism	
ENLS 203	Introduction to Race and Literature (Queerness and Race)	
ENLS 203	Introduction to Race and Literature (Reading Race in Time Travel)	
ENST 232	Identity, Inequality, and the Environment	
HIST 248	Topics in Russian History (Soviet Union as a Multiethnic Empire)	
HIST 260	Black Women's History	
HIST 278	Photographing Race	
LAMS 204	Racism(s) Across the Americas	
MIDE 315	Advanced Topics in Markets, Innovation and Design (1 course credit) (Marketing for Social Impact)	
MUSC 257	Music and Culture: Jazz, Rock, and Race	
PHIL 229	Philosophy and Race	
PHIL 264	Latin American, Latinx and Caribbean Philosophy	
POLS 246	Race Ethnicity and American Politics	
POLS 263	Race & Ethnicity in American Legal Thought	
SOCI 243	Sociology of Race and Ethnicity	
UNIV 299	Race and Ethnicity after Technology	
WMST 225	Reading Race, Gender and Sexuality	
WMST/CBST 227	Race and Sexuality	
Area or Ethnic Group		
Select at least two courses from the list of approved area or ethnic group courses. [2]		2
ANTH 256	Anthropology of Native North America	
ANTH 329	Religions in Africa: Spirits, Saints, and Sufis	
EDUC 227	Immigrant Youth in U.S. Society	
ENLS 213	Special Topics in American Literature (Beyond Rum and Revolution: imagining Cuba from the Diaspora)	
ENLS 214	US Latino/a Literature (Growing Up Latinx)	

ENLS 217	Studies in Dramatic Literature (Margins to the Mainstream: US Latino/a Theatre & Film)
ENLS 217	Studies in Dramatic Literature (The Theatre of the Civil Rights Movement)
ENLS 219	Studies-Selected American Authors (Melville's Sea, Faulkner's South, Morrison's Song)
ENLS 221	Introduction to African American Literature
ENLS 222	Ethnic Comedy in the United States
ENLS 227/CBST 222	Caribbean Literature
ENLS 229	Jewish American Comedy: Stage, Screen, Stand-up
ENLS 290	Special Topics (Affrilachia, Race, Power, and Regional Literature)
ENLS 306	US: Fever/Fantasy/Desire
ENLS 311	Seminar in Contemporary American Literature (Book Banning and US Latinx Literature)
FREN 236	Topics in Francophone Literature and Culture (French West Indies)
GRMN 274	Holocaust Literature
GRMN 276	German Jewish Identities
GRMN 279	Never Again?: Antisemitism
HIST 211	American West
HIST 214	Topics in American History (Native American History)
HIST 218	American Revolution (African Americans and the American Revolution)
HIST 222	U.S. History from the 1940s to the Present (When taught by Jennifer Thomson)
HIST 258	Topics in Women's and Gender History (Brujas, Machos y Travestis)
HIST 277	Gender in Africa
LAMS 150	Latin America: An Introduction
LAMS 203	Identity, Politics, Nation
LING 210	Language and Race
MUSC 248	Music and Culture: Jazz and Social Justice
MUSC 257	Music and Culture: Jazz, Rock, and Race
SOCI 258	Gender, Race and Poverty in the United States
SOCI 342	White Privilege and Whiteness Seminar
UNIV 200	Integrated Perspectives Course (Modern Africa)
WMST 225	Reading Race, Gender and Sexuality
WMST 332	Women & the Penal System

[1] The list of approved comparative/theoretical courses is available on the website of the Center for the Study of Race, Ethnicity & Gender (bucknell.edu/csreg.xml (http://www.bucknell.edu/csreg.xml)).

[2] The list of approved area or ethnic group courses is available on the website of the Center for the Study of Race, Ethnicity & Gender (bucknell.edu/csreg.xml) (http://www.bucknell.edu/csreg.xml).

- The fifth course may be selected from any of the three categories.
- Any given course may not count for more than one category.
- At least one course in the social sciences and one course in the humanities are required.
- No more than one 100-level course may count toward the minor.
- Students are encouraged to take the core course as early as possible.
- Courses other than those on the approved list may be approved by the Coordinating Committee on a case-by-case basis upon request of the student. These include interdisciplinary courses that span the humanities and social sciences, and courses in the natural sciences.
- Students are encouraged to discuss their selection of courses for the minor with a member of the Coordinating Committee.
- Students may request that study abroad courses be considered for the minor. The Coordinating Committee will consider such courses upon review of the syllabus.

Religious Studies

Faculty

Professors: Maria A. Antonaccio, Karline M. McLain, Rivka Ulmer, Carol Wayne White (Chair)

Associate Professors: Brantley Gasaway, John Penniman, Stuart Young

Assistant Professor: Caitlyn Olson

The academic study of religion equips students to analyze one of the most powerful and contested forces in the world. Our discipline fosters a deep understanding of different cultures, increases student sensitivity to the ambiguities and complexities of human existence, and encourages thoughtful and engaged citizenship in our interconnected world. Religious studies sits at the heart of a liberal arts education.

The mission of the religious studies department is to provide Bucknell students with the capacity to interpret how religion shapes and is shaped by our world. We pursue this mission through a transdisciplinary, trans-cultural, and trans-historical curriculum. Because the category of religion is itself entangled with the living legacies of colonialism, we are committed to interrogating how these legacies continue to shape the field. Our courses offer students opportunities to study a diverse spectrum of the world's religious traditions; to grapple with enduring questions of human meaning and purpose; and to cultivate the habits of intellectual exploration and resources of ethical reasoning necessary for lifelong learning about religion. The religious studies curriculum sharpens student skill sets in critical thinking, close reading, independent research, analytical writing and persuasive oral communication. As a result, our current students are prepared for multiple career pathways, and our alumni have distinguished themselves in a variety of professional fields. This mission is driven by faculty who actively pursue research at the cutting edge of the discipline, advancing knowledge about religion within their areas of expertise and to the broader public.

Major in Religious Studies

The religious studies **major** consists of at least eight courses:

One 100-level course in Religious Studies		1
At least four 200-level courses in Religious Studies		4
RELI 232	What is Religion? Theories and Methods	1
At least one 300-level course in Religious Studies		1
Completion of Culminating Experience [1]		1
Total Credits		**8**

[1] Culminating Experience can be either another 300-level course, an independent study project with a faculty advisor in the department or a senior honors thesis.

RELI 232 and 300-level courses will address the writing, speaking and information literacy requirements of the CASCC.

Religious studies majors are encouraged to pursue off-campus study either abroad or in approved domestic programs to broaden their understanding of religious pluralism both globally and in the United States. No more than two religion courses earned off campus may be used to meet the major requirements. Transfer students may appeal this restriction by writing to the chair of the department.

The religious studies department encourages majors to consider honors candidacy by completing an honors thesis in their final academic year. Students wishing to undertake an honors thesis should consult with their adviser in the fall semester of their junior year and declare their intentions and their thesis topic in the spring semester of their junior year.

Minor in Religious Studies

The **minor** in Religious Studies consists of four elective courses, at least one of which must be a 300-level seminar.

The **learning goals** of the religious studies major include:

1. Majors have general competence in key approaches and concepts in the academic study of religion.
2. Majors have the written and oral communication skills necessary to articulate ideas effectively and persuasively in religious studies.
3. Majors have the information literacy and critical thinking skills necessary to conduct independent research in religious studies.
4. Students gain a critical foundation for religious literacy.

Courses

RELI 100. Introduction to Religion. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This course will introduce students to the academic study of religion to provide a foundation for religious literacy. Multiple sections of this course are offered every semester, under a variety of titles.

RELI 200. Buddhism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
An interdisciplinary introduction to Buddhism, including basic teachings of liberation from suffering, impermanence, no-self, ethics, and meditation. Also explores the historical development of various streams of Buddhism in Asia and the West, with attention to the mutual influence between Buddhism and society, politics, and material culture. Crosslisted as EAST 251.

RELI 201. Islam. 1 Credit.
Offered Occasionally; Lecture hours:3
An overview of the many cultural expressions of Islam, which emerged in the 6th century and spread from Arabia to the larger world. The course will cover Muhammad as prophet, Qur'an as scripture, Hadith as religious narrative, and tensions between law, modernity, and mysticism.

RELI 202. Hinduism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A historical survey of Hindu religious traditions. This course traces the development of Hindu scriptures, rituals, philosophies, and ethics from the ancient to the contemporary world. Concepts such as karma, yoga, and reincarnation will be put in the broader contexts of Hindu dharma (religious law), theism, and ritual.

RELI 207. Holocaust: Event and Reception. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
During the Holocaust more than six million Jews, one third of the Jewish population of the world, were systematically killed. We study the event, reflections by major thinkers and scholars, and the aftermath of the Holocaust.

RELI 209. Israel: Land, People, and Tradition. 1 Credit.
Offered Occasionally; Lecture hours:3
Study of the complex relationship between Judaism and the sacred traditions of the Jews as related to the Land of Israel including the cultural situation and the Israeli-Palestinian conflict.

RELI 210. Judaism. 1 Credit.
Offered Occasionally; Lecture hours:3
A survey of Jewish religious traditions, addressing major historical developments (e.g., biblical, rabbinic, and modern periods) and basic rituals and theological issues (e.g., "chosenness", covenant, salvation).

RELI 212. Christianity. 1 Credit.
Offered Occasionally; Lecture hours:3
A broad introduction to Christianity, including a survey of Christian scripture, various Christian doctrines and beliefs, and major traditions of thought and practice within Christianity.

RELI 214. God, Nature, and Knowledge. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of various philosophical, religious, and scientific theories regarding the concept of divine nature, human nature, and non-human nature.

RELI 216. Philosophy of Religion. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Problems for rational inquiry arising from the claims and practices of religious faith, e.g., the nature of religious language, arguments for the existence of God, the concept of evil. Crosslisted as PHIL 223.

RELI 222. Images of Jerusalem. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This is a writing class (W2) focusing on Jerusalem (Israel), its history, as a pilgrimage site, and the three Western religions (Judaism, Christianity, Islam) in the city.

RELI 224. Global Religions and the Politics of Pluralism. 1 Credit.
Offered Occasionally; Lecture hours:3
Explores the presence and practice of global relations and analyzes the cultural and political challenges of religious pluralism. Students will examine a wide variety of religious traditions, assess how minority religions negotiate issues of acculturation, and evaluate the political problems often created by religious diversity. Prerequisite: permission of the instructor.

RELI 226. Environmental Ethics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of the major theories of environmental ethics, with particular attention to the challenge of developing an ethic commensurate with increasing human power. Crosslisted as ENST 236.

RELI 232. What is Religion? Theories and Methods. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Exploration of theoretical models and methods in religious studies. Readings from major texts may include sociological, psychological, anthropological and phenomenological approaches, along with challenges to such theories from thinkers of feminist, postmodern and postcolonial perspectives.

RELI 234. Issues of Religion and Culture. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:1; Repeatable
Focus on interdependence of religion and cultural phenomena: ideology; alienation; formation of world view; understandings of time and space; relation between church and state; faith and science.

RELI 235. Religion and Popular Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the relationship of religion to contemporary popular culture, both in how religion is portrayed (in music, movies, sports, and consumer culture) and how it is replicated (in ritual, myth, and morality).

RELI 236. Drinking Coffee, Tasting God. 1 Credit.
Offered Occasionally; Lecture hours:3
This course is an introduction to the mystical path of Islam, Sufism, and its transformation across time and place. It will cover Sufism's major figures, institutions, genres, its global expansion and adaptation, as well as its use of art, music, and, most importantly, coffee.

RELI 237. Judaism in Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This is an introduction to Judaism in Film. Judaism has been characterized as a culture, a civilization, a philosophy, a nation, an ethnic group, and a religion. In this introductory class we will discuss ritual, ethical and historical issues.

RELI 241. Religion and the Loss of Traditional Faith. 1 Credit.
Offered Occasionally; Lecture hours:3
Examination of new approaches (linguistical, philosophical, and hermeneutical) that challenge traditional Western religious ideas and the role of faith in contemporary world. Emphasis is on intersection of religion and critical theory.

RELI 242. Religious Naturalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will examine some of the diverse perspectives and ideas associated with religious naturalism. Students will explore the ways religious naturalists reconceptualize traditional concepts (God or supernatural theism), and examine their various approaches to understanding evil, morality, human nature, and humans' connectivity to nature.

RELI 245. Chinese Communist Religion. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on religion in modern China under the leadership of the Chinese Communist Party. It examines the development of Buddhism, Taoism, popular religions, and western religions in China, from ancient times to the present day, against the backdrop of political ideology that traditionally deems religion "the opiate of the masses." Crosslisted as EAST 252.

RELI 250. How to Be Alone: Religion, Solitude, and Loneliness. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of the diverse meanings, effects and cultural significance of being alone. This course engages philosophical and religious traditions that view solitude as a valuable practice rather than a problem to solve. It also considers the loneliness epidemic in America and various responses to it.

RELI 252. New Testament and Christian Origins. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of the earliest Christians through the writings that later became the New Testament. We will examine these sources in the context of their specific social and historical concerns and consider the complex process in which some writings were included in Christian scripture while others were rejected. Crosslisted as CLAS 252.

RELI 253. Dying for God: Martyrdom from Antigone to ISIS. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Early Christians were attracted to dramatic narratives of suffering--whether about spectacular deaths in the arena or extreme self-denial in the desert. This course explores the world of martyrs and monks and considers how ancient ideals about pain, gender, and sexuality continue to influence Christian thinking about holiness and sainthood. Crosslisted as CLAS 235 and WMST 245.

RELI 256. Islam in America. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces the history of Islam and Muslims in America starting from the first enslaved Muslims who were brought to the colonies to the present. It will also review US political and social relations with Muslim majority regions as well as Islam's role in the discourse of American power.

RELI 257. Yoga: Religion, History, Culture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Far from a new age health trend, yoga arose in the Indian subcontinent two millennia ago. This course explores the religion, history, and culture of yoga by reading classical yoga texts; examining the rise of guru-based yoga lineages and the development of postural yoga; and studying yoga's recent global spread.

RELI 260. Women, Gender, Islam. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of how Muslims have conceived of and performed gender, both historically and today. Counter to the trope that "Islam oppresses women," we will consider an array of gendered dynamics that characterize Muslim societies. We will also examine the geopolitical contexts that contribute to this trope to begin with. Crosslisted as WMST 260.

RELI 262. Islamic Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to Islamic law, examining how it developed, how it works and how it has shaped Muslim societies, past and present. In exploring these topics, students will engage with a wide range of sources, including legal theory, fatwas (legal opinions) and court cases.

RELI 276. Judaism and Masculinity. 1 Credit.
Offered Occasionally; Lecture hours:3
Theories of Judaism, masculinity and maleness applied to the bodies of athletes; Jewish/Black bodies; the body of soldiers; stereotyping; human and divine bodies; Jewish feet, nose, ideal bodies.

RELI 279. Judaism and Law. 1 Credit.
Offered Occasionally; Lecture hours:3
Explores the cultural and ethical complexities of Jewish Law in the U.S., Europe, and the unique legal system of the state of Israel.

RELI 280. Religion and Constitutional Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the developing relationship between religion and American constitutional law, focusing on historic documents and Supreme Court decisions relating to the First Amendment. Crosslisted as POLS 247.

RELI 281. Religion and American Politics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the historical relationship of religion and American politics, focusing on the impact of religion in both domestic and foreign policy.

RELI 301. Ethics in/and the Anthropocene. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The cumulative force of human impacts on the planet has led scientists to name our era the Anthropocene or Age of Humans. This course will explore the profound dilemmas of living in a time of increased responsibility and extreme uncertainty. How should we think about ethics in this new context?.

RELI 302. Humanism, Naturalism, Atheism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examination of the various factors that have resulted in a loss of traditional faith and exploration of new religious perspectives grounded in humanism, naturalism, and atheism. Topics include emerging views of humanity; the interplay of artistic creativity and religion; the role of science; ecology and religion; and atheistic, ethical perspectives.

RELI 305. The Male Body in Judaism. 1 Credit.
Offered Occasionally; Lecture hours:3
Investigates the male body from Jewish and comparative perspectives: the body of athletes; Jewish/Black relations; theories of masculinity; the body of soldiers; stereotyping; human and divine bodies. Prerequisites: sophomore, junior, or senior status and permission of the instructor.

RELI 306. Messianism and Madness. 1 Credit.
Offered Occasionally; Lecture hours:3
Judaism and Jewish sectarianism include numerous Messianic figures: from Jesus to Messiah Ephraim; Shabbetai Zvi; Zionism; kabbalistic, midrashic, philosophical, Hassidic, and contemporary ideas of redemption. Prerequisite: sophomore, junior, or seniors only. Others by permission of instructor.

RELI 310. Topics in Religion and Law. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
This course will examine aspects of the relationship between religion and law in global, regional, tradition-based, and/or historical contexts. Prerequisite: sophomore, junior or senior status only. Open to others by permission of the instructor.

RELI 312. Digesting Divinity: Religion, Food and Diet. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course considers the relationship between food, consumption, and the construction of religious identity. Students will read a wide range of sources from antiquity to the present, exploring the ways in which food customs structure human belief and function as a point of communication between humanity and divinity.

RELI 315. Topics in American Religion. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
This course will examine specific topics in American religion including in-depth analyses of religious movements and traditions in America. Prerequisite: sophomore, junior or senior status only. Open to others by permission of the instructor.

RELI 316. Topics in Religion and Culture. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
This course will examine the interrelation between religion and cultural phenomena in diverse contexts of human experience. Prerequisite: sophomore, junior or senior status only. Open to others by permission of the instructor.

RELI 317. Cultivating the Self. 1 Credit.
Offered Occasionally; Lecture hours:3
Study of self-cultivation as a central theme in religious and philosophical reflection. Students will explore different meanings of self-cultivation as a practice of training the self's energies to attain an ideal of human excellence in multiple traditions. Prerequisite: sophomore, junior or senior only. Open to others by permission of instructor.

RELI 318. Jewish Thought. 1 Credit.
Offered Occasionally; Lecture hours:3
Text-based class: cultural influences upon Jewish thought and practice in major Jewish books, traditional and contemporary Judaism, from Philo to Derrida: Human existence and identity. Prerequisite: sophomore, junior, or senior only. Open to others by permission of instructor.

RELI 320. Individual Studies In Religion. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Guided investigations. Open to qualified students with some previous study of religion who wish to pursue individual programs of study in the field. Prerequisite: Only by permission of the instructor.

RELI 325. Major Religious Thinkers. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
The thought, historical setting, and influence of one or more classical religious thinkers, e.g., Paul the Apostle, Augustine, Kierkegaard, Confucius, Rosenzweig, Gandhi. Prerequisite: sophomore, junior, or senior only. Open to others by permission of the instructor.

RELI 350. Honors Thesis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3; Repeatable
Honors thesis. Prerequisite: permission of the instructor.

RELI 400. Senior Seminar - Culminating Experience. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
The Senior Seminar is required for all majors in Religious Studies, and is designed to give majors an opportunity to integrate the knowledge and skills they have acquired, and to hone their research, writing, and oral skills. Prerequisites: Open to seniors in Religious Studies and others by permission of instructor.

Residential College

Faculty

Academic Co-coordinators: Peter Brooksbank, Virginia Zimmerman

This Living-Learning Community program seeks to enrich students' learning experience by integrating academic life into the residence halls. The nine residential college themes are:

- Arts
- Discovery
- Food
- Global
- Humanities
- Languages & Cultures
- Nature & Innovation
- Social Justice
- Society & Technology

Each college is organized around a common theme. All students enrolled in a residential college take a common course called a Foundation Seminar in the fall semester. They also live on the same residence hall floor for both fall and spring semesters of their first year. Students organize a variety of extracurricular programs related to the college themes. Upper-class students who wish to continue their affiliation with a college may continue to live together and take additional courses.

All RESC 098 courses fulfill the Foundation Seminar and W1 requirements.

More information at bucknell.edu/ResColleges. (http://www.bucknell.edu/ResColleges/)

Courses

RESC 098. Foundation Seminar in Residential Colleges. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Foundation seminar offered only through the individual Residential Colleges. Prerequisite: permission of the instructor.

RESC 121. Social Justice Learning Community. .25 Credits.
Offered Both Fall and Spring; Lecture hours:1; Repeatable
This seminar replaces the Social Justice Residential College while it takes a year hiatus. Students will critically examine marginalization based on intersections of age, ability, class, gender, race, religion and sexuality, with the goal of working towards a more just Bucknell. Includes funded weekly lunch and a trip to D.C.

RESC 220. Residential College Dinner Seminar. .25 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Other:1.5; Repeatable
Students will build on capacities achieved during the first year by constructing and then engaging in a set of learning experiences in a group.

RESC 221. Residential College Dinner Seminar. .25 Credits.
Offered Spring Semester Only; Lecture hours:Varies,Other:1.5; Repeatable
Students will complete the set of learning experiences constructed in the fall and will present their work to first-year students in the same Residential College. Prerequisite: permission of the instructor.

Social Justice Minor

Faculty

Coordinator: William F. Flack

The minor consists of five credits: a core course and four electives. At least one of the five courses must be a community-based research/service-learning course (see footnote[1]).

Core Courses

The core courses are intended to provide students with the ability to assess contrasting views of what constitutes social justice and include both self-reflection and critical thinking. In addition, core courses may also give historical background on an issue or issues of social injustice and/or provide an introduction to concepts such as oppression and privilege.

ENST 255	Environmental Injustice and Activism	1
PHIL 214	Social and Political Philosophy	1
POLS 210	Political Theory	1

Electives

To ensure interdisciplinary study and encourage students to develop knowledge of a number of different social justice issues, electives are divided into five categories. A student must take their four courses from at least two of the five categories and from at least two different disciplines or departments. No more than two courses may be at the 100 level.

A. Gender & Sexuality

ANTH 290	Medical Anthropology	1
EDUC 290	Gender Issues in Education	1
ENLS 228	Gender and Sexuality in America	1
HIST 100	Thinking about History	1
HIST 214	Topics in American History	1
HIST 222	U.S. History from the 1940s to the Present	1
HUMN 320	History of Sexuality	1
PHIL 230	Feminist Philosophy	1
POLS 213	Gender and Politics in Comparative Perspective	1
POLS 388	Gender & International Relations	1
PSYC 303	Critical Psychologies [1]	1
SOCI 100	Introduction to Sociology	1
SOCI 241	Marriages and Families in the 21st Century	1
SOCI/WMST 328	Mating and Marrying in America	1
WMST 150	Introduction to Women's and Gender Studies	1
WMST 225	Reading Race, Gender and Sexuality	1
WMST 232	Gender and Sexuality in South Asia	1

B. Race & Ethnicity

ANTH 256	Anthropology of Native North America	1
ECON 270	South Africa: Social Entrepreneurship	1
EDUC 318	Critical Multiculturalism	1
ENLS 203	Introduction to Race and Literature	1
ENLS 300	Seminar in Literary Theory and Criticism	1
ENLS 311	Seminar in Contemporary American Literature	1
HIST 100	Thinking about History	1
HIST 214	Topics in American History	1
HIST 219	American Abolition	1
HIST 220	American Civil War and Reconstruction	1
HIST 290	Europe Imperialism and Colonialism	1
MUSC 257	Music and Culture: Jazz, Rock, and Race	1
PHIL 229	Philosophy and Race	1
POLS 211	Politics of the Developing World	1
POLS 219	Latin American Politics	1
POLS 246	Race Ethnicity and American Politics	1
POLS 263	Race & Ethnicity in American Legal Thought	1
POLS 353	Comparative Ethnic Politics	1
PSYC 240	Critical Multicultural Psychology	1
RELI 209	Israel: Land, People, and Tradition	1
SOCI 243	Sociology of Race and Ethnicity	1

C. Poverty, Inequality & Class

ANTH 266	Money, Markets and Magic [2]	1
CLAS 337	Use and Abuse of the Past: Adaptation and Revision	1
ECON 204	Intermediate Political Economy	1
ECON 270/UNIV 284	South Africa: Social Entrepreneurship [1, 2]	1
EDUC 101	Diversity, Equity and the Foundations of American Education	1
EDUC 227	Immigrant Youth in U.S. Society	1
EDUC 318	Critical Multiculturalism	1
GEOG 201	Special Topics in Geography	1
GEOG 209	Economic Geography [2]	1
HIST 290	Europe Imperialism and Colonialism	1
IREL 240	Human Security [2]	1
IREL 252	Political Economy of Global Resources [2]	1
MORS 250	Poverty and Organizations	1
PSYC 307	Culture and Child Development	1
PSYC 320	Children's Studies [1]	1
SOCI 311	Globalization, Technology and Cultural Change	1
SOCI 351	Field Research	.5-2
WMST 251	Gender, Power and Global Development	1

D. Environmental Justice

ANTH 260	Environmental Anthropology	1
ENLS 272	Studies in Literature and the Environment	1
ENST 211	Environmental Pollution and Control	1
ENST 221	Hazardous Waste and Society	1
ENST 232	Identity, Inequality, and the Environment	1
ENST 236	Environmental Ethics	1
ENST 245	Environmental Politics, Policy, & Justice	1
ENST 246	Environmental Activism	1

ENST 255	Environmental Injustice and Activism	1
ENST/ENLS 278	World Literature and Environmental Justice	1
ENST 286	Imagining Sustainability	1
ENST 325	Nature, Wealth and Power	1
UNIV 200	Integrated Perspectives Course (The Anthropocene)	1
UNIV 200	Integrated Perspectives Course (04: Food Justice/Food Insecurity) [1, 2]	1
UNIV 200	Integrated Perspectives Course (01: Climate Change Science and Ethics)	1

E. Law, Religion & Human Rights

ENLS 290	Special Topics	1
IREL 255	International Law	1
POLS 219	Latin American Politics	1
POLS 274	Human Rights in International Relations	1
POLS 364	Justice and Public Policy	1
PSYC 359	Psychology and Law	1
RELI 280	Religion and Constitutional Law	1
RELI 281	Religion and American Politics	1
SOCI 251	Violence and Society	1
UNIV 192	Food, Faith, Justice: Baltimore	.5

Poverty Studies Concentration

Students may choose a concentration in poverty studies by choosing a core course and at least three electives that focus significantly on issues of poverty. These courses (see footnote[2]) allow students to combine their coursework with a poverty studies internship offered each year through the Shepherd Consortium.

1 Community-based research/service-learning course.
2 Poverty studies course.

Sociology

Faculty

Professors: Deborah A. Abowitz, Elizabeth Durden (Chair), Alexander Tristan Riley

Associate Professor: Matthew Baltz

Assistant Professors: Karen Altendorf (Teaching), Mette Evelyn Bjerre, Emmanuel Cannady, Apollonya Maria Porcelli

Visiting Assistant Professor: Jinpu Wang

The department encompasses two disciplines, sociology and anthropology, and offers separate majors and minors in each.

Sociology is the study of human social action. It emphasizes an appreciation of human diversity, social inequality and the processes that govern groups, organizations, communities, cultures and nation states. Because these areas of study are integral to a liberal arts education, the department encourages students with diverse majors to take courses at all levels.

Among other things, a major in sociology can assist those interested in graduate work. It also offers a background for careers in law, journalism, government and international affairs, teaching, social work and public service.

Honors

The department strongly encourages qualified majors to consider working for honors in sociology. Such students should consult in their junior year with one or more members of the faculty of the department to begin defining a research topic and writing a proposal. Normally, during the senior year, an honors student will enroll in SOCI 319 Honors Course in Sociology and, if agreed to by the academic adviser, a second semester in SOCI 320 Honors Course in Sociology. The honors proposal is to be approved by the department chairperson and submitted to the Honors Council by the honors program calendar deadline posted online. Further information can be obtained from the student's academic adviser, the department chairperson and from the Honors Council.

Sociology Major

The major in sociology requires nine courses. Students may count a total of two anthropology courses (one elective course and one theory/methods course) toward the sociology major. No more than two 100-level courses may be counted toward the sociology major. Requirements are as follows:

1 100-level SOCI course		1
4 SOCI Electives (one must be at the 300 level)		4
SOCI 365	Advanced Seminar in Sociology (Culminating Experience)	1
Students must take ONE of the following methods courses:		1
SOCI 208	Methods of Social Research	
SOCI 209	Analyzing the Social World	
Students must take ONE of the following theory courses:		1
SOCI 211	Classical Sociological Theory	
SOCI 212	Sociological Theory	
Students must take ONE ADDITIONAL theory/methods course from the following list:		1
SOCI 201	Field Research in Local Communities	
SOCI 208	Methods of Social Research	
SOCI 209	Analyzing the Social World	
SOCI 211	Classical Sociological Theory	
SOCI 212	Sociological Theory	
ANTH 283	Theory in Anthropology	

The major in sociology provides students with an overview of the discipline; broad exposure to social issues and sociological concerns, and a variety of specialty areas in the field; reading and writing skills, and information literacy. Courses emphasize careful reading and analysis of sociological and theoretical texts, qualitative and quantitative methods, writing as part of both the research process and the presentation of results, presentation to multiple audiences, and how to find and use information from multiple sources. Students will graduate prepared for the workforce or graduate/professional study.

The department strongly recommends that core courses be taken as early as possible in a student's career (preferably during the sophomore or junior year). Students should take at least one sociology course at the 100 or 200 level before taking the methods courses (SOCI 201, SOCI 208 or SOCI 209). Methods courses are not intended for first-year students.

Courses that are cross-listed as anthropology and sociology courses count as sociology courses and still allow sociology majors to take one elective designated solely as an anthropology course.

Up to two off-campus courses may count toward 200-level electives in the major. The department chair may allow off-campus courses to count toward other major requirements if these courses adequately substitute for material that is taught in our department.

Minor in Sociology

The minor in sociology requires five courses in sociology. Students may count no more than two 100-level courses toward the five courses required. Courses in anthropology may not be counted toward the sociology minor unless courses are listed as satisfying both sociology and anthropology major credit. No more than one off-campus course ordinarily counts toward the minor.

Sociology Learning Goals

Demonstrate a working knowledge of the core concepts of sociology (social structure; culture; social stratification and inequality; race, ethnicity and gender; and globalization).

Demonstrate a working knowledge of the nature, methods and critical thinking skills in qualitative and quantitative research methodologies in the field.

Apply an understanding of sociology to one's professional, personal and civic lives.

Develop an appreciation for the rich diversity within and between societies and cultures.

Courses

SOCI 100. Introduction to Sociology. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
The concepts and methods sociologists use to investigate human groups. Focuses on the study of social organization, its variety and development. Preference given to first and second year students. Juniors and seniors by permission only.

SOCI 110. Social Problems in the 21st Century. 1 Credit.
Offered Occasionally; Lecture hours:3
Focuses on the sociological approach to social problems, studying existing problems like poverty and inequality plus new or changing problems such as war and terrorism.

SOCI 1NT. Sociology Non-traditional Study. .5-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in sociology. Prerequisite: permission of the instructor.

SOCI 201. Field Research in Local Communities. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Participant-observation, interviewing, and other field research methods. Students will devise and conduct their own ethnographic research projects in a local community. Not open to first-year students. Crosslisted as ANTH 201.

SOCI 203. Social Psychology. 1 Credit.
Offered Occasionally; Lecture hours:3
Survey of major theoretical and methodological approaches in sociological social psychology with emphasis on real-word social interactions and relationships. Topics include learning and socialization, social interaction, stratification, development of self and the social construction of identity, deviance, health and illness, social attitudes and behaviors, emotions, relationships, aggression and conflict.

SOCI 205. Conservative, Reactionary, and Anti-Revolutionary Thought in the Western World. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will introduce students to a range of social, political, and cultural thought from the right.

SOCI 208. Methods of Social Research. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to various paradigms of social research with emphasis on the logic of social inquiry, research design and data collection. Requires two prior sociology courses and permission of the instructor.

SOCI 209. Analyzing the Social World. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A course in sociological data analysis, using the General Social Survey and other data sets, promoting student research.

SOCI 211. Classical Sociological Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of major theories and theoretical traditions in sociology from roughly 1850 to 1920. The work of Karl Marx, Emile Durkheim, and Max Weber is often the centerpiece of the course.

SOCI 212. Sociological Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course introduces students to theory construction and development in sociology. We will explore how social theorists develop conceptual categories, societal taxonomies, and causal frameworks designed for explanation of phenomena in human behavior and social organization.

SOCI 220. Environmental Sociology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will examine how human society shapes and is shaped by our natural environment. We will explore the intersection between the environment and key social problems, such as social inequality, racism and climate change. We will also examine efforts to improve the environment from grassroots movements to advanced technology.

SOCI 222. School & Society. 1 Credit.
Offered Occasionally; Lecture hours:3
An introduction to sociology of education, this course considers the role of schools and education in society. Topics covered include various sociological perspectives on schools, what students learn, and how educational systems interact with other political, economic, and cultural institutions.

SOCI 224. Special Topics in Sociology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Topics related to current events/issues in Sociology.

SOCI 227. Oceans and Society. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
In this class we will uncover the many ways in which human societies are inextricable from the world's oceans and address themes such as scientific uncertainty, environmental racism, immigration, colonialism and urban sustainability. Walruses, anchovies, artisanal fishers, coastal cities and factories will all lie at the center of weekly discussions. Crosslisted as ENST 237.

SOCI 229. Law and Society. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An overview of law and the legal system from sociological, theoretical and methodological perspectives. This course focuses on the impact of social institutions on the social organization of law, the structure of the criminal and civil processing system and justice and inequality in the legal system.

SOCI 232. Sociology of Health and Medicine. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course will provide students with a sociological analysis of various health/illness issues and the health services industry. Students will investigate how race, gender, socio-economic status and their intersections impact health disparities and inequalities.

SOCI 233. Sociology of Social Problems. 1 Credit.
Offered Occasionally; Lecture hours:3
This course offers a critical examination of major social problems in the contemporary United States within the context of wider global issues.

SOCI 234. Criminology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Theories and research in criminal behavior and the societal reaction to criminality. Causes and consequences of crime, including public policy formulations.

SOCI 236. Social Movements and Collective Action: Contemporary Society and Implications for Social Change. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
People's mobilization capacity to fight for social change is a crucial dimension of the social world. However, few people actually ever participate in social movements. Why? In this course, we will study movements from across the globe to elucidate how movements form, what sustains them, and do they actually work?.

SOCI 240. The Social Forms of Religious Life: Religion's Role in Social Order and Conflict. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Examination of the evolutionary roots of religion; the role of religion in "world-construction," social solidarity and social change; the secularization thesis; civil religion; fundamentalisms, cults, other new religious movements; religious violence and terrorism. Special attention given to Christianity and Islam.

SOCI 241. Marriages and Families in the 21st Century. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Focusing on courtship, marriages, and families in the 21st century U.S., we explore how work and family life vary by gender, race, and social class.

SOCI 243. Sociology of Race and Ethnicity. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
Studies the concepts and social significance of race/ ethnicity and major race/ethnic groups within the United States. Emphasis on varying theoretical and methodological approaches to the sociological study of race/ethnicity.

SOCI 247. Class and Politics in the US. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Introduction to a sociological approach to politics. Exploration of classical debates in political sociology and key issues relevant for understanding the contemporary United States, including the politics of taxation, social assistance and market regulation, political discrimination and exclusion, militarism, and social movements.

SOCI 248. Nationalism in the 21st Century. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the history of nationalism and how its profound legacies intersect with problems in the 21st century. We will typically investigate economic inequality and migration, human-driven climate change, resource and "vaccine nationalism," war, and other forms of political extremism and violence committed "in the name of the nation.".

SOCI 249. Doing Gender: Self & Society. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the social construction and performance of gender in our daily lives. We consider what it means to live in a gendered society, from micro level issues of identity (the self) to the way macro level social institutions (society) create structures of gendered privilege and inequality.

SOCI 250. Drugs and the Carceral State through 'The Wire'. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Explore sociological theories and concepts through all five seasons of The Wire, David Simon's critically-acclaimed show about life in Baltimore, MD. This course complicates traditional narratives about drugs, poverty, structural and interpersonal violence, deindustrialization, crime, street-level bureaucracies, local politics, media and knowledge towards a deeper understanding of today's societal ills.

SOCI 251. Violence and Society. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
The study of violent social, political, and legal institutions: domestic violence, sexual coercion, vigilantism, political conflict; the production and control of criminal violence.

SOCI 252. Faces of Death: Death in Human Nature and Culture. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course investigates the place of death in human nature and culture. We will look at death as a biological, social, and cultural fact for the human species. Funeral ritual and mourning will be studied in global and historical framework but with emphasis on the modern world.

SOCI 258. Gender, Race and Poverty in the United States. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course investigates the realities of poverty through an intersectional lens. Topics include historical understandings of poverty; depictions of poverty in pop culture; the impact of the COVID-19 pandemic on poverty in the U.S. and bringing attention to populations that often get left out of mainstream conversations about poverty.

SOCI 261. Sociology of the Arts. 1 Credit.
Offered Occasionally; Lecture hours:3
An introduction to artistic work and its reception from evolutionary, social, and cultural perspectives. We will explore the reasons why humans make art, the forces that affect artistic works and careers, and the formation of artistic tastes.

SOCI 262. American Society and Culture. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Exploration of central aspects of American society and culture including national identity, class structure and stratification, ethnic and racial group coexistence and conflict, family structure, religious ideologies and immigration patterns.

SOCI 299. Topics in Sociology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topics will vary each semester.

SOCI 2NT. Sociology Non-traditional Study. 1-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies; Repeatable
Non-traditional study in Sociology. Prerequisite: permission of the instructor.

SOCI 311. Globalization, Technology and Cultural Change. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Examination of the impact of the processes of global restructuring and the technological revolution on people, culture and society. This class will focus on Latin America and the Caribbean. Crosslisted as LAMS 311.

SOCI 319. Honors Course in Sociology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:12; Repeatable
Each student selects a project to be developed individually. Prerequisite: permission of the instructor.

SOCI 320. Honors Course in Sociology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:12; Repeatable
Each student selects a project to be developed individually. Prerequisite: permission of the instructor.

SOCI 324. Opium of the Intellectuals. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A seminar on Western intellectual and cultural elites and their worldview.

SOCI 325. Advanced Reading in Sociology. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:12; Repeatable
Readings developed around the interest of individual students. Prerequisite: permission of the instructor.

SOCI 326. Advanced Reading in Sociology. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:12; Repeatable
Readings developed around the interest of individual students. Prerequisite: permission of the instructor.

SOCI 328. Mating and Marrying in America. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
This is a course on changing patterns in American courtship (dating), marriage, and family life from the 20th to the 21st century. Prerequisite: permission of the instructor. Crosslisted as WMST 328.

SOCI 335. Topics in Cultural Sociology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Substantive examination of particular topics/themes through the lens of cultural sociology.

SOCI 337. America in Black and White. 1 Credit.
Lecture hours:3
This course is focused on the White and Black American experiences. America in Black and White will explore the historical and present day government policies, private business interests and personal stereotypes that have resulted in social, political and economic advantages provided to one group while actively disenfranchising another.

SOCI 341. Seminar in Law and Society. 1 Credit.
Lecture hours:3
Structure and process of legal institutions: police, courts, prisons, lawyers, juries, and extralegal mechanisms relevant to the legal system.

SOCI 342. White Privilege and Whiteness Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
What is whiteness? What is white privilege? What explains their durability in today's world? In this seminar, we will read contemporary non-fiction books to understand 21st-century racial domination, power and privilege. You will leave this course better equipped with insight necessary to disrupt personal, institutional and worldwide systems of oppression.

SOCI 343. Global Communities. 1 Credit.
Offered Occasionally; Lecture hours:3
Explores the complexities of globalization, analyzing its benefits, challenges and diverse impacts. The course hones critical thinking, reading, writing and communication skills while addressing global political, economic, cultural and environmental issues. Students will engage with multiple perspectives to become informed participants in global discussions and problem-solving. Crosslisted as ECON 243.

SOCI 344. Contemporary Issues in American Corrections. 1 Credit.
Offered Occasionally; Lecture hours:3
This seminar explores dynamic and controversial issues facing the American corrections system today. We will examine the historical context that shaped the current system, analyze its implications and consider ethical questions related to correctional practices. We will explore mass incarceration, the privatization of prisons, inequality and racial disparities, rehabilitation programs and health. Prerequisite: SOCI 100 or permission of the instructor.

SOCI 345. Nations, Nationalism, and Confounding Problems in the 21st Century. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the intersection between the history and legacies of nationalism and several confounding problems in the 21st century. Such problems will typically include economic inequality and migration, human-driven climate change, resource and "vaccine nationalism," and forms of political extremism and violence committed "in the name of the nation.".

SOCI 351. Field Research. .5-2 Credits.
Offered Alternating Spring Semester; Lecture hours:Varies; Repeatable
Independent investigation in the field; formulation of hypotheses, construction of measuring instruments, data collection, data analysis, and test of hypotheses. Prerequisite: permission of the instructor.

SOCI 355. Technology, Power and Politics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
How is the progression of technology changing our society? How is it used to serve the interests of the powerful and impact politics? This course answers these questions and more as we delve into the current realities and potential futures of artificial intelligence, social media algorithms and surveillance technologies.

SOCI 356. The Sixties and American Society: Conflict, Contravention, Consequences. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This is a course on major social, cultural and political conflicts and change in the US from roughly 1955-1975 and the long-term consequences for contemporary American life. Close examination of New Left, civil rights movement, student movement, feminist movement, Vietnam War and counterculture.

SOCI 365. Advanced Seminar in Sociology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Focuses on selected topics of the discipline of sociology. Topics depend on professor and change with each offering. This culminating experience course is only open to senior sociology majors. Senior sociology minors and junior sociology majors by permission only.

SOCI 370. Senior Thesis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:9; Repeatable
Senior thesis. Prerequisite: permission of the instructor.

SOCI 380. Beyond Borders: A Global Comparative Sociology of Poverty. 1 Credit.
Offered Occasionally; Lecture hours:3
Poverty is a social condition defined by a lack of the necessary resources needed to maintain a minimum living standard. However, the definition of poverty is highly localized and culture-specific. In this seminar, we will investigate the causes, consequences and possible solutions to poverty in the U.S. and globally.

SOCI 3NT. Sociology Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in Sociology. Prerequisite: permission of the instructor.

Spanish

Faculty

Professors: Fernando Blanco, M. Isabel Cuñado, Elisabeth Guerrero, Collin McKinney

Associate Professors: Jason Aaron McCloskey (Chair), Ana M. Patiño, Hiram L. Smith

Assistant Professor: Roberto Martínez Bachrich

Visiting Assistant Professor: Sophia Nuñez

The Department of Spanish

The Department of Spanish at Bucknell University is committed to providing excellent instruction and learning opportunities that challenge majors and minors and other interested students to develop their Spanish language proficiency to the maximum, as well as to know and understand the literature and culture of the Spanish-speaking peoples of the world. We encourage our students to think critically, to question their cultural assumptions about the Hispanic world, and to immerse themselves as much as possible in a Spanish-speaking community.

The major in Spanish is designed to cultivate our students' understanding and appreciation of the rich literary, linguistic and cultural traditions of Spanish-speaking peoples; to provide a sound foundation for graduate study related to the Hispanic worlds; and to develop our students' ability to critically analyze literary and cultural works in Spanish. Coursework in the Spanish major will help students meet the goals of the College of Arts & Sciences and of the University as a whole with regard to writing, information literacy and public presentation.

Through their coursework in the major, students are introduced to the discipline of Hispanic letters and linguistics. They also explore connections between Spanish and other disciplines in the humanities or in the social sciences. To achieve a high level of language proficiency and cultural understanding, it is strongly recommended that students majoring in Spanish study at least one semester in Spain with Bucknell en España or in Latin America with one of the approved programs in Argentina, Chile, Costa Rica, the Dominican Republic or Ecuador, among others. The language proficiency attained by our students, along with the cultural understanding they gain through their studies at Bucknell and abroad, will allow them to interact effectively with Spanish-speaking peoples throughout the world. By relating to Hispanic cultures, our students increase their self-awareness and their sense of connection to a diverse world.

Sequence and Description of Courses

The academic program in Spanish offers coursework in the areas of language, literature, culture and linguistics of the Hispanic world, including Spain, Latin America and the United States. The curriculum takes into account a wide variety of student needs and interests, including those of heritage students, students who plan to pursue graduate study and careers in Spanish/Hispanic studies, and those who hope to apply their language skills and cultural understanding to their chosen profession. The curriculum in Spanish encompasses three levels: 1.) courses that focus on language acquisition and cultural competency (100 and 200 level), 2.) courses that introduce students to the breadth and diversity of literature, culture and linguistics of the Spanish-speaking world (200 level), 3.) courses that provide an in-depth study of an author, period, genre or issue in Hispanic literature, culture and linguistics (300 level).

After gaining an understanding of Hispanic literary and cultural traditions in coursework at the 200 level, students complete the major with at least two 300-level courses (seminars) offering an in-depth study of particular aspects of Hispanic literature, culture or linguistics. These courses are related to the professor's area of expertise and normally require that students participate actively in class discussion, make formal presentations in class and write a research paper in Spanish. As part of the learning activities in this seminar, students will carry out a research project related to Hispanic literature, culture or linguistics under the supervision of the course instructor, and will present the critical essay in its final written form at the end of the semester as evidence of their fulfillment of the Spanish department's learning objectives for writing and information literacy.

Planning Ahead

Students are strongly encouraged to continue their study of Spanish as early in their undergraduate career as possible. Doing so will ensure that they can complete the major or minor, will make them eligible for the best study abroad programs in the Hispanic world, and will help them to reach a high level of language proficiency.

Online Placement Exam

Students who want to take a course in Spanish must take the online placement test to determine the level at which they may register. Information on accessing the test is included in the first-year student registration information; it is recommended that students take the exam as early as possible. Current students may access the placement test from the Spanish department webpage (https://www.bucknell.edu/academics/college-arts-sciences/academic-departments-programs/spanish/). Any questions regarding placement should be directed to the Spanish department chairperson.

Summary of Spanish Major Requirements

A major in Spanish requires at least eight credits above SPAN 105 Intermediate Spanish, four of which must be taken at Bucknell.

Students usually begin by enrolling in language courses. The language course students take is determined by the placement exam. SPAN 206 Spanish for the Professions or SPAN 207 Toward Advanced Spanish and SPAN 208 Advanced Conversation and Composition are the only language courses that may be counted toward the major. Students must complete SPAN 208 Advanced Conversation and Composition or test out of it to enroll in 200-level literature, culture and linguistics courses.

Students must take one of the following literature courses: SPAN 220 Introduction to Spanish Literature or SPAN 222 Introduction to Latin American Literature. Students must take one of the following culture courses: SPAN 270 Spanish Cultural Tradition or SPAN 280 Latin American Cultural Traditions. At least one of these courses must deal with Spain and at least one of these courses must deal with Latin America.

Students must take at least two 200-level courses above SPAN 208 Advanced Conversation and Composition before enrolling in a 300-level course. Students must take at least two 300-level courses. At least one of these 300-level courses must focus on Hispanic literature or culture.

Visual Summary of Spanish Major Requirements

Language Courses		**0-2**
SPAN 206	Spanish for the Professions (depends on placement)	
or SPAN 207	Toward Advanced Spanish	
SPAN 208	Advanced Conversation and Composition (depends on placement)	
200-level Literature and Culture		**2**
SPAN 220	Introduction to Spanish Literature	
or SPAN 222	Introduction to Latin American Literature	
SPAN 270	Spanish Cultural Tradition	
or SPAN 280	Latin American Cultural Traditions	
200-level Literature, Linguistics or Culture Electives (as necessary or desired)		**0-4**
300-level Seminars		**2**
Total		**8**

Additional Information

- A link to the placement exam can be found on the Department of Spanish website.
- All courses are taught in Spanish unless otherwise indicated.
- Students whose language proficiency places them higher than SPAN 208 may substitute another course in advanced language, literature or culture (SPAN 220-SPAN 295) to reach the total number of eight required courses.
- If studying abroad, one of either SPAN 220, SPAN 222, SPAN 270 or SPAN 280 must be taken on campus. At least one of the courses taken abroad for credit toward the Spanish major must deal with literature.
- A student may request permission from the Department of Spanish to count an Integrated Perspectives (IP) course for a 200-level Spanish credit provided that it is co-taught by a faculty member of the Department of Spanish and the subject relates to Hispanic cultures.
- A 300-level course may be used to count toward a 200-level course, with approval of an adviser, but the student must still take two additional 300-level courses to complete the major.
- All 300-level courses fulfill the Culminating Experience.
- All 300-level courses must be taken at Bucknell.
- One course focused on Spanish or Latin American studies taught in English may be counted toward the major with the approval of the Spanish department chair.
- Students seeking certification to teach Spanish in elementary or secondary school must complete the major in Spanish as well as the requirements formulated by Bucknell's education department, in accordance with the guidelines of the Commonwealth of PA.

Study Abroad

Residence abroad in a Spanish-speaking country is the best way to gain the language proficiency and the knowledge of Hispanic literature and cultures expected for the major. Students are strongly urged to study abroad on a program approved by the Spanish department for its majors and minors. Only courses taken on these programs may count toward the major and minor. At least one of the courses taken abroad for credit toward the Spanish major must deal with literature. Students who have taken two courses in Hispanic literature at Bucknell may present to the Spanish department chairperson a petition to have this requirement waived. Approved study abroad programs may change from year to year.

Study in Spain

The University's Bucknell en España provides a study abroad experience designed to meet the educational needs of Spanish majors, minors and other Bucknell students who have taken SPAN 105 Intermediate Spanish, or can demonstrate the equivalent level and who wish to study in Spain. The program is centered at the Universidad de Granada in Granada, Spain.

Study in Latin America

For majors and minors, the Spanish department has approved study abroad programs in, for example, Argentina, Chile, Costa Rica, the Dominican Republic and Ecuador. Students should consult with their advisers in Spanish, the Spanish department chair, or the Office of International Education regarding these programs.

Honors

Majors who are interested in writing an honors thesis and who meet the requirements established by the Honors Council should speak with a faculty member in Spanish during the junior year to discuss this possibility.

Minor in Spanish

The **minor** in Spanish consists of five courses beyond SPAN 103 Toward Intermediate Spanish. At least two of the courses for the minor must deal with literature or civilization and at least three of the courses counted for the minor must be taken at Bucknell. Students who go on the Bucknell *en España* program and plan to minor in Spanish need to take two courses on campus.

All courses are taught in Spanish, unless otherwise indicated. SPAN 208 Advanced Conversation and Composition is a prerequisite for courses numbered SPAN 220 through SPAN 295. Two 200-level courses beyond SPAN 208 are prerequisites for courses at the 300-level.

The learning outcomes in place for the Spanish major are the following:

1. Speak at the advanced-mid level, in accordance with the criteria of the Association of College Teachers of Foreign Languages (ACTFL).
2. Write at the advanced-mid level, in accordance with the criteria of the Association of College Teachers of Foreign Languages (ACTFL).
3. Identify key movements, works and authors in Hispanic literary and cultural production.
4. Write coherent and well-organized critical analyses of literary and cultural works from the Hispanic tradition, including critical language appropriate to the genre or medium, reasoned arguments supported by textual evidence and critical theory, as well as documented research and citation appropriate to the discipline.
5. Make a public presentation of a critical or creative project in Spanish.
6. Describe how one's major studies in Spanish prepare them to engage in dialogue with Spanish-speaking peoples from a variety of nations/cultures and to think critically about issues related to Hispanic cultures.

Courses

SPAN 101. Elementary Spanish I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Beginning language skills, with practice of points of grammar, through listening, speaking, reading and writing, in the context of Hispanic cultures. SPAN 101 is prerequisite to SPAN 102.

SPAN 102. Elementary Spanish II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1
Continues development of basic language skills, with practice of points of grammar, in the context of Hispanic culture. Prerequisite: SPAN 101 or two years of Spanish in high school.

SPAN 103. Toward Intermediate Spanish. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Through grammar review and the development of new linguistic skills, in the context of Hispanic cultures, students reach intermediate competency in Spanish. Prerequisite: SPAN 102 or three years of secondary school Spanish.

SPAN 105. Intermediate Spanish. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Review of grammar and development of new linguistic skills and cultural competency to reach high-intermediate level in Spanish. Prerequisite: SPAN 103 or four years of secondary school Spanish.

SPAN 206. Spanish for the Professions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Moving from intermediate toward advanced proficiency, this course offers a review of grammar, reading, writing and discussion about cultural texts with a focus on topics specific to the professions (business, health, education, law). Prerequisites: SPAN 105 with a minimum grade of D or five years of secondary school Spanish.

SPAN 207. Toward Advanced Spanish. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Students demonstrating high-intermediate skills progress toward advanced language proficiency. Reading, discussion and writing about brief literary or cultural texts advances cultural competency. Prerequisite: SPAN 105 or five years of secondary school Spanish.

SPAN 208. Advanced Conversation and Composition. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
Advanced study and practice to enhance oral and written proficiency. A variety of texts and media, including literature, film and internet sources provide a point of departure for class discussion and written assignments. Prerequisite: SPAN 207 or six years of Spanish.

SPAN 220. Introduction to Spanish Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to Spanish literature across major artistic and cultural periods: Middle Ages, Renaissance, Golden Age, Romanticism, Realism, and 20th-century literature in its cultural context. Prerequisite: SPAN 208.

SPAN 222. Introduction to Latin American Literature. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to the authors, topics and genres that constitute the literary tradition of Latin America. Literary works are studied in their historical and cultural context. Prerequisite: SPAN 208.

SPAN 239. Hispanic Linguistics. 1 Credit.
Offered Occasionally; Lecture hours:3
Introduction to phonetics and phonology, morphology, syntax, semantics, and dialects of the Spanish language. Prerequisite: SPAN 208.

SPAN 245. Topics in Spain. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Guides students in their experience of life and culture in Spain, and fosters their reflection on the cross-cultural learning experience. Only offered in the Bucknell en España program.

SPAN 264. Hispanic Topics. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Given in English, this course will treat different topics of Spanish and Latin American civilization from year to year. Prerequisite: SPAN 208.

SPAN 270. Spanish Cultural Tradition. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to the cultural tradition of Spain through the study of art, history, literature, and film. Prerequisite: SPAN 208.

SPAN 275. Structural Analysis of Spanish. 1 Credit.
Offered Occasionally; Lecture hours:3
Advanced students/prospective teachers explore the interface between linguistics and actual language use by native Spanish speakers through analysis of morphology, syntax and semantics. Prerequisite: SPAN 208.

SPAN 280. Latin American Cultural Traditions. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to the cultural traditions of Latin America through the study of art, history, literature, and film. Prerequisite: SPAN 208.

SPAN 285. Latinx Literature in the U.S.. 1 Credit.
Offered Occasionally; Lecture hours:3
Taught in English. This course focuses on issues of cultural identity within the literary and some film production of Latinx peoples living in the U.S. Prerequisite: SPAN 208.

SPAN 290. Independent Study. 1 Credit.
Offered Occasionally; Lecture hours:Varies; Repeatable
Subject to be selected by student in consultation with the instructor. Prerequisite: permission of the instructor. Prerequisite: SPAN 208.

SPAN 295. Topics in Spanish. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Deals with a different aspect of the literature or culture of Spanish-speaking peoples each time it is given. Prerequisite: SPAN 208.

SPAN 2NT. Spanish Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in Spanish. Prerequisite: permission of the instructor.

SPAN 315. Structure of Modern Spanish. 1 Credit.
Offered Occasionally; Lecture hours:3
Introduction to morphology, syntax, semantics and discourse analysis with particular attention to the problems faced by the non-native learner of Spanish. Prerequisites: two courses at 200-level beyond SPAN 208.

SPAN 322. Modern Spanish Literature. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Spanish literature of the 19th and 20th centuries. Course will be devoted to a different major author, movement, or genre each time it is given. Prerequisites: two courses at 200-level beyond SPAN 208.

SPAN 323. Latin American Short Story. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Art and theory of the short story in Latin America. Topics include Colombian Short Stories, Stories by Women Writers, Children's Stories. Prerequisites: two courses at 200-level beyond SPAN 208.

SPAN 325. Spanish Civil War: Lit. & Film. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines the memory of the Spanish Civil War in the narrative and film from the 1940s to the present. Prerequisites: two courses at the 200-level beyond SPAN 208.

SPAN 329. Pirates of the Golden Age. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines the portrayal of pirates and piracy in texts from a variety of genres from the sixteenth- and seventeenth-century Hispanic world. Drawing on theoretical and historical readings, the course reflects on the philosophical, sociological, legal, scientific and religious premises of piracy. Prerequisite: two 200-level courses beyond SPAN 208.

SPAN 339. Topics in Hispanic Linguistics. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Advanced study of topics or issues in Hispanic Linguistics. Prerequisites: two 200-level courses beyond SPAN 208.

SPAN 349. Spain Today: Literature & Film. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines key works of fiction and film at the light of cultural, social and political changes undergone in Spain since 1975. Prerequisites: two 200-level courses beyond SPAN 208.

SPAN 350. Latin American Cities. 1 Credit.
Offered Occasionally; Lecture hours:3
A study of cities in Latin America. We will explore issues that include the environment, cultural production, socio-political concerns and historical contexts for the cities we study. Prerequisites: two courses at 200-level beyond SPAN 208.

SPAN 356. Trauma and Memory. 1 Credit.
Offered Occasionally; Lecture hours:3
This class explores contemporary canonical and non-canonical Latin American narratives whose aesthetics deal with traumatic/violent experiences. Holocaust Studies, Trauma Theory and Psychoanalysis inform the readings and discussions focusing on the ways literature responds to certain social and cultural crisis in the region. Prerequisites: two 200-level courses beyond SPAN 208.

SPAN 361. Topics in Hispanic Literature. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
These courses will deal with topics in Spanish literature on an advanced level. Prerequisites: two 200-level courses beyond SPAN 208.

SPAN 362. Topics in Latin American Literature. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
These courses will deal with topics in Latin American literature on an advanced level. Prerequisites: two 200-level courses beyond SPAN 208.

SPAN 364. Topics in Spanish Civilization. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
This course will deal with different topics in the civilization of Spain on an advanced level. In Spanish. Prerequisites: two 200-level courses beyond SPAN 208.

SPAN 365. Topics in Latin American Civilization. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
This course will deal with different topics in the civilization of Latin America on an advanced level. In Spanish. Prerequisites: two 200-level courses beyond SPAN 208.

SPAN 368. Spanish Civilization and Popular Culture. 1 Credit.
Offered Occasionally; Lecture hours:3
This course will deal with Spanish civilization and examines a variety of topics--politics, gender, regional identities, etc.--through the lens of popular culture. Possible course themes include Spanish soccer, comics and graphic novels, and food. Prerequisites: two 200-level courses beyond SPAN 208.

SPAN 390. Independent Study. 1 Credit.
Offered Occasionally; Lecture hours:Varies
Subject to be selected by student in consultation with the instructor. Prerequisites: two 200-level courses beyond SPAN 208 and permission of the instructor.

SPAN 399. Honors Course in Spanish. 1 Credit.
Offered Occasionally; Lecture hours:Varies
For selected seniors, who will be supervised in individual work. Prerequisite: permission of the instructor.

Theatre & Dance

Faculty

Professors: Anjalee Deshpande Hutchinson (Chair), Dustyn Martincich, F. Elaine Williams

Associate Professors: Kelly Knox (Director, Dance), Bryan Vandevender

Assistant Professors: Carly Holzwarth, Jaruam Miguez Xavier

Affiliated Faculty: Meenakshi Ponnuswami (Associate Professor-English), Jaye Austin Williams (Assistant Professor-Critical Black Studies)

Visiting Assistant Professor: Ashlyn Baruti

Lecturer: Heath J. Hansum (Co-Director, Theatre)

Professional Staff: Mark Hutchinson (Co-Director, Theatre), Natalie Shoch

Introduction to the Department of Theatre & Dance

We believe in creating opportunities for our students to become strong impactful leaders, engaging and innovative artists and compassionate members of a global community. Our aim is for students to develop deeper understandings of multiple cultures and perspectives through the eyes of artists. We train our students to express these understandings through the powerful mediums of theatre and dance. Our graduates are future artists and leaders uniting, inspiring and embracing the goal of collaborative performance. Our students embody this goal as they strive to discover and reveal the meaning in the world around us.

Major Requirements

The **major** in theatre offers opportunities in all phases of theatre arts and consists of a minimum of 10 course credits.

2 Theatre Histories		**2**
THEA 256	Rituals, Festivals, Institutions	
THEA 260	Theatre and Revolution	
1 Dramatic Literature		**1**
Listed courses taught outside of the Department of Theatre & Dance will only count toward the Dramatic Literature requirement if there are no Theatre & Dance Dramatic Literature offerings that semester.		
THEA 202	Script Analysis	
THEA 265	Special Studies in Theatre (Dramaturgy)	
CBST 255	Radical Black Drama & Performance	
CBST 265	(Really) Reading Black Plays: August Wilson, Part 1	
CLAS 222	Greek Tragedy	
ENLS 217	Studies in Dramatic Literature	
ENLS 257	Shakespeare	
1 Stage Craft		**1**
THEA 145	Bucknell Backstage	
1 Design		**1**
THEA 246	Scene Design	
THEA 247	Visual Style	
THEA 248	Theatrical Lighting Design	
THEA 249	Mask and Makeup Design	
THEA 251	Costume Design	
THEA 252	Sound Design	
THEA 255	Topics in Costume Production	
1 Performance		**1**
THEA 110	Acting I	
THEA 207	Musical Theatre	
THEA 220	Acting Methods	
THEA 230	Acting Styles	
THEA 242	Introduction to Devising: Design and Performance	
2 Electives		**2**
Two credits of theatre & dance courses. Four quarter-credits are equivalent to one elective. Two half-credit courses are equivalent to one elective. Courses could include DANC courses or THEA courses that could include, but are not limited to:		
THEA 101	Technical Theatre Practicum	
THEA 102	Theatrical Rehearsal and Performance	
THEA 240	Directing the Play	
THEA 245	Entertainment Technology	

THEA 250	Colorful Fashion Histories	
THEA 253	Culture, Identity and Dress	
THEA 264	Theatre in London	
THEA 265	Special Studies in Theatre (Dramaturgy)	
THEA 2NT	Theatre Non-traditional Study	
Two 300-Level Courses		**2**
Choose two, one must be in the senior year		
THEA 319	Individual Projects	
THEA 321	Film Acting and Directing	
THEA 342	Devising Performance Mainstage	
THEA 347	Visual Style	
THEA 357	Opus; Senior Theses in Solo Performance	
THEA 365	Independent Studies in Theatre	
THEA 380	Ethics & Theatre	
THEA 390	Applied and Interactive Theatre	
THEA 393	Seminar in Avant-Garde Performance	
THEA 397	Seminar in Special Topics	
THEA 3NT	Theatre Non-traditional Study	

In regard to THEA 101 or THEA 102, a maximum of one-half credit is permitted per semester and there is a limit of two full course credits in all. Faculty will supervise student participation, provide instruction and approve the awarding of all credit.

Students pursuing emphases in acting, directing, design, stage management or dramaturgy/playwriting will be advised through suggested guidelines from their adviser. Faculty advisers will carefully develop a course of study with students to meet their individual needs and educational goals.

Learning Goals

The Department of Theatre learning goals support and seek to exemplify the goals of the University as well the College of Arts & Sciences Core Curriculum. In specific, our learning goals connect to the CASCC Learning Goals for Disciplinary Exploration and Disciplinary Depth.

Formal Presentation Experience

In the practice of theatre, successful collaboration and communication is key to successful work. Students majoring in theatre will gain extensive experience in formal presentation through scene presentation, design project presentation, presentations on topics in history and dramatic literature, and the presentation of applied projects in performance, directing and design.

Writing Within the Major

The goals of the theatre major include demonstration of knowledge of Western dramatic literature and artistic media and performance styles from Western and non-Western traditions. Students majoring in theatre will learn to formulate critical/analytical responses to theatre through written and oral communication.

Information Literacy

Information, digital and visual literacy play a significant role in the study, understanding and practice of theatre. Students in theatre will learn to conduct research using a variety of sources, including primary and secondary materials; field specific and multidisciplinary databases; and a variety of media including print, film/video and digital. Students will learn to effectively evaluate and analyze these sources through in-class discussion and synthesis. Students will study and become familiar with legal and ethical considerations in the use of sources. Theatre students will become proficient in the use of technology in the presentation of applied theatre projects.

Senior Year Culminating Experience

Theatre students will take two 300-level courses, one of which will be in the senior year, and participate in an exit interview that will focus on an oral presentation of the culmination of undergraduate scholarship in theatre. In preparation for the exit interview, students will complete one paper analyzing their four years of scholarly work in theatre. The 300-level course in the senior year, in combination with the CE paper and the exit interview, will serve as the three components of the Culminating Experience for the major.

Honors in Theatre

A program leading to a major with honors in theatre may be proposed by the student by their junior year in consultation with the department chair and under the guidance of a faculty member. The student generally undertakes a specifically designed sequence of courses, independent research, and a creative project culminating in the stage direction or design of a mainstage production, a performance project or a research paper in the area of theatre history, criticism or dramatic literature. Students writing theses should enroll in THEA 319 Individual Projects or THEA 365 Independent Studies

in Theatre during the semester in which they plan to complete the thesis. Guidelines for creative honors theses are available from the department chair.

The Minors in Theatre

The minor in theatre is for liberal arts students who wish to broaden their experience with the theatre arts.

Three **minors** are offered by the department:

Acting & Directing Minor

The Acting & Directing minor requires a minimum of five and one-half credits including:

THEA 256	Rituals, Festivals, Institutions	1
or THEA 260	Theatre and Revolution	
Three electives in performance (one of which may be THEA 240 or THEA 249)		3
One 300-level theatre course		1
THEA 101	Technical Theatre Practicum (one section)	.25
THEA 101	Technical Theatre Practicum (one section of either)	.25
or THEA 102	Theatrical Rehearsal and Performance	
Total Credits		**5.5**

Design & Technology Minor

The Design & Technology minor requires a minimum of five and one-half credits including:

THEA 256	Rituals, Festivals, Institutions	1
or THEA 260	Theatre and Revolution	
Three electives in design and technology (one of which may be THEA 250)		3
One 300-level theatre course		1
THEA 101 & 101	Technical Theatre Practicum and Technical Theatre Practicum (two sections)	.5

General Theatre Minor

The General Theatre minor requires a minimum of five and one-half credits including:

THEA 256	Rituals, Festivals, Institutions	1
or THEA 260	Theatre and Revolution	
One performance course		1
One design or technology course		1
One 200-level elective		1
One 300-level theatre course		1
THEA 101	Technical Theatre Practicum (one section)	.25
THEA 101	Technical Theatre Practicum (one section of either)	.25
or THEA 102	Theatrical Rehearsal and Performance	
Total Credits		**5.5**

Minor in Dance

The six-credit curriculum for a minor in dance is designed to provide a broad perspective and solid foundation in the technical, theoretical and practical experience necessary for the development of intelligent dance artists. The minor is intended to enable liberal arts students who are pursuing other challenging academic disciplines the opportunity to explore high quality dance, performance and research throughout their college career. The curriculum acknowledges experiential training as paramount to the field of study, offering classes in a variety of dance forms toward developing competency in a variety of techniques and styles. Many technique and performance courses are repeatable for credit in recognition of the importance of consistent and ongoing training at the appropriate level. Dance history and composition form the core of the theoretical requirements and are enhanced by cross-disciplinary study in design, production and performance courses.

Students minoring in dance are expected to participate in dance productions throughout their Bucknell career. Performance and choreographic opportunities include mainstage and showcase concerts in the Harvey M. Powers Theatre, Weis Center for the Performing Arts, Tustin Studio Theatre and alternative spaces. Weekly, semester-long rehearsals and guest artist residencies for dancers of every level provide opportunities to learn original choreographies, classic reconstructions and a variety of dance forms.

Students interested in a minor in dance should contact the director of dance for guidance on the curriculum.

The minor in dance is structured as follows:

Theory Requirements

Three course credits.

DANC 250	History of Dance	1
DANC 262	Dance Composition	1
An additional course focusing on a related element of dance including:		1
THEA 145	Bucknell Backstage	
THEA 207	Musical Theatre	
THEA 242	Introduction to Devising: Design and Performance	
THEA 246	Scene Design	
THEA 247	Visual Style	
THEA 248	Theatrical Lighting Design	
THEA 249	Mask and Makeup Design	
THEA 250	Colorful Fashion Histories	
THEA 251	Costume Design	
THEA 252	Sound Design	
THEA 253	Culture, Identity and Dress	
Additional courses in the Department of Theatre & Dance are subject to approval.		
Total Credits		**3**

Technique Requirements

Three course credits total.

Students are required to complete two of the following advanced technique courses:		1
DANC 205	Jazz Dance Technique II	
DANC 220	Modern Dance Technique II	
DANC 240	Ballet Technique II	
Additionally, students must complete a range of styles with four of the following technique courses:		2
DANC 105	Jazz Dance Technique I	
DANC 120	Modern Dance Technique I	
DANC 140	Ballet Technique I	
DANC 205	Jazz Dance Technique II	
DANC 220	Modern Dance Technique II	
DANC 240	Ballet Technique II	
DANC 263	Special Studies in Dance	
DANC 273	American Social Dance	
DANC 335	Advanced Training and Technique	
DANC 355	Pointe and Variations	
Total Credits: 3		

Departmental Learning Goals:

- Develop an understanding of Western dramatic literature and performance styles as a part of humanistic and cultural studies.
- Integrate knowledge of defining elements of performance style and methodology of approach into performance practice.
- Develop knowledge of visual literacy in the relation of artistic media to theatre styles.
- Synthesize the critical, analytical and creative aspects of theatre through writing or oral presentation.
- Integrate elements of design and principles of composition with technology into production practice.
- Create effective production laboratory projects through research, interpretation, conceptual discussion and practice.
- Create effective production laboratory projects through strong collaborative practice.

Dance Courses

DANC 105. Jazz Dance Technique I. .5 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
Beginning level course on jazz as an American vernacular dance form emphasizing its roots in African and Latin cultural rhythms, as well as contemporary technique.

DANC 120. Modern Dance Technique I. .5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Beginning level technique emphasizing the basic principles of different modern dance styles, dynamics and alignment through floorwork, locomotor patterns, improvisation, and movement combinations.

DANC 140. Ballet Technique I. .5 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Other:3; Repeatable
Beginning level ballet course emphasizing fundamental classical ballet technique and vocabulary necessary for performance.

DANC 205. Jazz Dance Technique II. .5 Credits.
Offered Alternate Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Intermediate/advanced jazz dance course emphasizing complex combinations in technique and rhythm of American vernacular, Broadway, and contemporary jazz.

DANC 210. Brazilian Fusion Dance. .5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Enhances efficient use of the body as a vehicle for expression, unfolding how dance can be decolonized by connecting with vernacular practices in the African-Brazilian diaspora, such as Capoeira. Students are expected to physically engage in exercises during class time, be open to repetition, and learn dance phrases.

DANC 215. Special Topics in Dance. 1 Credit.
Offered Occasionally; Lecture hours:1.5,Other:1.5; Repeatable
Lecture/laboratory course emphasizing the discovery and exploration of basic movement principles, which could include historical, cultural, or social approaches to kinesthetic experiences. Topics vary.

DANC 217. Musical Theatre Dance Repertory. .5 Credits.
Offered Alternate Fall or Spring; Lecture hours:1.5,Other:1.5
An experiential study of American musical theatre dance repertory, including signature work of key choreographers and how the role of movement and focus on the body tells the story of American popular culture throughout the 20th century. Some previous movement experience is necessary.

DANC 220. Modern Dance Technique II. .5 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
Intermediate advanced level technique exploring the basic principles of different modern dance styles, alignment, dynamics, and musicality through floorwork, locomotor patterns and movement combinations.

DANC 240. Ballet Technique II. .5 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
Intermediate advanced level ballet course emphasizing the development of technique and performance aesthetics.

DANC 250. History of Dance. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Survey of Western and non-Western dance forms both as reflective of cultural history and as an art form from ancient times to the present.

DANC 262. Dance Composition. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Investigation of the fundamental elements and underlying principles of the craft and art of dance composition emphasizing practical experience in structuring solo and group choreography. Prerequisite: permission of the instructor.

DANC 263. Special Studies in Dance. .5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Study of specific dance technique, performance theory, repertory section, and/or methodology emphasizing an experiential understanding of the specific genre.

DANC 273. American Social Dance. .5 Credits.
Offered Alternate Fall and Spring; Lecture hours:Varies,Other:3
No experience required. A kinesthetic American history course, this class will focus on the various popular dance forms of the 20th century common to American dance halls, television and movies, stage, and streets.

DANC 275. Dance Conditioning. .5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Investigation of principles of conditioning emphasizing strengthening, alignment, flexibility, and injury prevention through such integrative techniques as Pilates, Yoga, Floor Barre, and other body/mind systems.

DANC 319. Individual Projects. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies; Repeatable
Individual, special projects supervised by instructor. Prerequisites: junior or senior status and permission of the instructor.

DANC 335. Advanced Training and Technique. .5 Credits.
Offered Alternating Spring Semester; Lecture hours:Varies,Other:2; Repeatable
This course is designed to supplement rigorous physical training for advanced dancers with ballet, jazz, and/or modern backgrounds. Prerequisites: DANC 205, DANC 220, or DANC 240 and permission of the instructor.

DANC 355. Pointe and Variations. .5 Credits.
Offered Alternating Spring Semester; Lecture hours:Varies,Other:2; Repeatable
Applied pointe technique emphasizing individual artistic development using classical or contemporary variations appropriate for each student's skill level and interest. Previous pointe experience required.

DANC 360. Rehearsal and Performance. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
Quarter-course credit for substantial participation in dance production. Prerequisite: permission of the instructor.

Theatre Courses

THEA 101. Technical Theatre Practicum. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:2.5; Repeatable
Quarter-course credit for supervised participation in any one of several aspects of theatrical production of the Department of Theatre and Dance's major productions. Prerequisite: permission of the instructor.

THEA 102. Theatrical Rehearsal and Performance. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:4; Repeatable
Quarter-course credit for substantial participation in a major theatrical production; for example, as actor, stage manager, vocal coach, choreographer. Prerequisite: permission of the instructor.

THEA 104. Creative Scholarship & Presentation. .25 Credits.
Offered Spring Semester Only; Lecture hours:2,Other:1; Repeatable
This course is designed to prepare students to present their creative scholarship in performance, directing, design, playwriting, dramaturgy, and/or other recognized sub-disciplines of theatre, at a regional theatre conference. Students work directly with faculty to develop their scholarly projects for a broader academic, disciplinary and professional audience.

THEA 110. Acting I. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:1.5,Other:1.5
Introduction to acting: a critical approach to drama and personal expression, including physical, vocal, and interpretive aspects of performance. Prerequisite: seniors by permission only.

THEA 145. Bucknell Backstage. 1 Credit.
Offered Fall Semester Only; Lecture hours:1,Other:2
Bucknell Backstage is an introductory course where craft, art and engineering intersect. Subject areas include Stage Management, Lighting, Sound, Properties, Painting, Stagecraft, Rigging and Wardrobe. Preference given to Theatre Majors. Prerequisite: permission of the instructor.

THEA 149. Introduction to Theatre and Performance Reviewing. 1 Credit.
Offered Occasionally; Lecture hours:3
Introductory study of theatre (playwriting, directing, acting, movement, design, criticism); stresses the elements of drama, their interaction, and their realization in theatrical production. Students will view and respond to performances in writing using a variety of critical strategies. Attendance at performances outside of the class meeting time is required.

THEA 202. Script Analysis. 1 Credit.
Offered Occasionally; Lecture hours:3
An introduction to the various methods of play analysis utilized by actors, directors, designers, dramaturgs, and other theatre artists. Special attention is given to the play as a blueprint for theatrical production and the playwright's use of dramatic structure, action, subtext, and symbolism. Writing Intensive (W2).

THEA 207. Musical Theatre. 1 Credit.
Offered Occasionally; Lecture hours:1.5,Other:1.5
An experiential study of musical theatre as an art form with unique conventions and aesthetics, focusing on the performance and production elements of the Broadway stage. Some experience suggested.

THEA 220. Acting Methods. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:Varies,Other:3
Application of Sanford Meisner and Michael Chekhov Acting techniques to the rehearsal and performance of monologues and scenes. Emphasis on characterization and authenticity in performance. Prerequisites: THEA 110 and permission of the instructor.

THEA 230. Acting Styles. 1 Credit.
Offered Occasionally; Lecture hours:4
Scene study for performance with heavy emphasis on characterization, textual analysis and cultural, historical and societal research. Prerequisites: THEA 110 or equivalent course and permission of the instructor.

THEA 240. Directing the Play. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
The study of the art and craft of directing including visual composition, textual analysis and actor coaching. Emphasis on the critical and creative responsibilities of the director, including the foundational principles of directing and their application. Prerequisites: THEA 110 or THEA 220, or permission of the instructor.

THEA 242. Introduction to Devising: Design and Performance. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:Varies,Other:3
Exploration into methods/means of creating theatre; investigating devised performance while applying techniques of devising practitioners toward generating new work. Focus is collaboration: seeking to find ways of sharing artistic journey, creating works with multidimensional vision and creating theatrical productions. Prerequisite: permission of the instructor.

THEA 245. Entertainment Technology. 1 Credit.
Offered Occasionally; Lecture hours:1,Other:2
From sawdust to soundboards this course focuses on today's technical stage environment including scenery construction, lighting, sound systems and rigging for theatre, dance, and music concerts. Prerequisite: permission of the instructor.

THEA 246. Scene Design. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Create an environment for the action. The stage visual environment embodies mood, character, period style, and concept architecturally. Projects and plays in different styles are evolved through art and architectural research, scale model building, and drafting. The class models collaborative practice key to successful theatre and dance production.

THEA 247. Visual Style. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:1,Other:2
Designers collaborate on puppetry, theatre, installation, and environmental art. Emphasis on exploring performer/object/audience relationships and looking to influential visual arts movements such as the Bauhaus Theatre Workshop for inspiration. Crosslisted as THEA 347.

THEA 248. Theatrical Lighting Design. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:1,Other:2
An introduction to and practice in theatrical stage lighting. Primary emphasis in aesthetics and function of light in design. Prerequisite: permission of the instructor.

THEA 249. Mask and Makeup Design. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:Varies,Other:3
The studio class progresses from fashion, character, and age makeups to fantasy and makeup as mask. The design of three dimensional masks emphasizes the ways that the performance, ritual, and festival traditions of the Americas, Africa, Asia, Europe and Oceania have influenced present performance styles in theatre and dance.

THEA 250. Colorful Fashion Histories. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
This course examines the most colorful moments throughout the histories of costume and fashion. This course is designed as a global view of fashion histories through the lens of color. Specifically, the creation, use and power of color will be considered through material, political and social research.

THEA 251. Costume Design. 1 Credit.
Offered Fall Semester Only; Lecture hours:1,Other:2
This course examines costume design for performance through the main areas of skills/techniques, processes/procedures, analysis/research and history. In addition to lectures and discussions, students will receive hands-on lab experiences with materials used by costume designers while working to create costume designs for specific theoretical performances.

THEA 252. Sound Design. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:2,Other:2
This course is directed at students with limited experience in sound design. The course will explore both theoretical and practical aspects of audio mixing and reinforcement. This course is focused on Theatre and other types of live stage performance.

THEA 253. Culture, Identity and Dress. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
This course explores dress and clothing as an expression of culture. Topics include: agency, practice, identity, performance, cultural preservation, aesthetics, the body, gender, ethnicity, globalization.

THEA 254. Computer-Aided Design for the Stage. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:1
An introduction to CAD for use in theatre and other entertainment venues. Includes basic CAD training in technical drafting, scenic modeling and lighting design.

THEA 255. Topics in Costume Production. 1 Credit.
Offered Occasionally; Lecture hours:Varies,Other:3
Use creativity and imagination in the studio to explore the sculptural and expressive nature of costume design as art. Prerequisite: permission of the instructor.

THEA 256. Rituals, Festivals, Institutions. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Surveys the historical development of global performance traditions from prehistory through the European Renaissance. Special attention will be paid to theatre and performance in Asia, Africa and Latin America, as well as the role that social and religious institutions play in organizing theatrical practice.

THEA 260. Theatre and Revolution. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Focuses on the relationship between ideology and media, specifically how theatre promotes, resists or escapes from the conflict between the status quo and revolutionary change.

THEA 262. Special Topics in Dramatic Literature. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:1
A special topics course. A range of subjects may be studied dealing with historical periods, genres, styles, themes and methodologies for analyzing dramatic literature, included but not limited to dramaturgy, musical theatre, contemporary drama, feminist drama, queer drama and drama of the global majority.

THEA 264. Theatre in London. 1 Credit.
Offered Both Fall and Spring; Lecture hours:2,Other:3
Theatrical productions on the contemporary London stage studied through attendance at performances, script analysis and discussions with actors, directors, designers, and production personnel. Prerequisite: permission of the instructor. Crosslisted as ENLS 289.

THEA 265. Special Studies in Theatre. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies,Other:3; Repeatable
A special topics course. A range of subjects may be studied dealing with theatre practice, history or theory, including but not limited to histories and traditions of the global majority, stage management, career preparation or specialty lecture topics.

THEA 2NT. Theatre Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in theatre. Prerequisite: permission of the instructor.

THEA 302. Pedagogies of Acting. .5 Credits.
Offered Occasionally; Lecture hours:1,Other:2.5
Explore methods of instruction, lesson planning, course building as well as comparing acting techniques, from both Western and non-Western traditions as they relate to the beginning levels of actor training. Students will act as teaching assistants in the THEA 110 Acting I class. Prerequisite: THEA 110.

THEA 319. Individual Projects. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Individual, special projects supervised by the instructor, honors thesis. Prerequisite: permission of the instructor.

THEA 321. Film Acting and Directing. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
This course will explore film acting and directing in the genre of realism. Students will have workshops, lectures and projects that will allow them to explore film acting in coordination with the students from ENFS 238: Film Production. The course will cumulate with a production of a web series.

THEA 340. Advanced Directing. .25 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:9; Repeatable
This course is for students interested in pursuing advanced directing projects as well as further development of the directing tools and techniques first introduced in Directing THEA 240. As such they will participate in visual composition exercises, analytical discussions and direct a longer final "Nightcap" directing production.

THEA 342. Devising Performance Mainstage. 1 Credit.
Offered Occasionally; Lecture hours:3
An exploration into the process of creating collaborative theatre for the Department of Theatre and Dance Main Stage Season. This class examines new ways of authoring performance with multiple artists (designers, writers, performers, etc.) working together to manifest a shared vision. Prerequisite: permission of the instructor.

THEA 347. Visual Style. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:1,Other:2
Designers collaborate on puppetry, theatre, installation, and environmental art. Emphasis on exploring performer/object/audience relationships and looking to influential visual arts movements such as the Bauhaus Theatre Workshop for inspiration. Crosslisted as THEA 247.

THEA 357. Opus; Senior Theses in Solo Performance. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:Varies,Other:6
This course is an exploration into the art and craft of Solo Performance. Solo performance entails a single person performing for an audience's full consideration. Solo performance artistry not only encompasses an aptitude for acting but also necessitates strong skills in playwriting, designing, directing and choreography.

THEA 365. Independent Studies in Theatre. 1 Credit.
Offered Occasionally; Lecture hours:Varies,Other:3; Repeatable
Independent special studies in theatre or dance performance, history, design, or technology. Prerequisite: permission of the instructor.

THEA 380. Ethics & Theatre. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
An introduction to ethics by way of dramatic literature and case studies in theatre practice, this course provides critical tools for identifying and addressing professional theatre's ethical dilemmas. Special attention is paid to race, ethnicity, and gender with respect to systems of white supremacy and heteropatriarchy.

THEA 390. Applied and Interactive Theatre. 1 Credit.
Offered Occasionally; Lecture hours:Varies,Other:2
Explores theatrical performance as a vehicle for social transformation. Uses techniques from Theatre of the Oppressed, Playback Theatre and improvisation to develop community-oriented service learning projects. Prerequisite: permission of the instructor.

THEA 393. Seminar in Avant-Garde Performance. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
This study of experimental aesthetics traces the development of a new paradigm for 20th and 21st-century "multi-media" art forms and the aesthetics of "total theatre." Thematic topics such as The Theatre of Social Change, The Self as Content, Theatre and Therapy, The Poor Theatre, Environmental and Formalist Experiments, Performance Art.

THEA 397. Seminar in Special Topics. 1 Credit.
Offered Occasionally; Lecture hours:3; Repeatable
Particular theatre topics selected by the instructor. Prerequisite: permission of the instructor.

THEA 3NT. Theatre Non-traditional Study. .5-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in theatre. Prerequisite: permission of the instructor.

Translation Studies Minor

Faculty

Coordinator: Katherine M. Faull

Translation studies is an interdisciplinary area within the humanities that incorporates the study of the theory of translation with the practice of translation from one language to another. Translation (distinct from interpretation) refers to written work encompassing a full spectrum of genres, from literary translation of prose and poetry to translation of what is referred to as informational texts, such as manuals, legal briefs and other commercial documentation.

Students in the translation studies minor will engage in an examination of translation from multiple perspectives that provides an educational path toward the acquisition of general and specific knowledge about the field of translation studies, its history, evolution and theories. Further, they will be trained in the practice of critical thinking about language use and translation; and broaden and deepen their understanding of translation as it relates to power relations, politics, ethics, cultural issues, gender, post-colonialism, etc. Additionally, the minor in translation studies provides students with an opportunity to acquire important skills in their respective target language(s), such as conducting research in preparation for translation, sound writing skills in one's source language, learning proper analytical processes and appropriate use of current technological resources in the field.

A minor in translation studies consists of four courses.

The following two courses in Translation Studies:		**2**
HUMN 260/EAST 205	Introduction to Translation Studies	
HUMN 340	Seminar in Translation Studies	
One course in Linguistics:		**1**
LING 105	Linguistic Analysis: Sounds and Words	
or LING 110	Linguistic Analysis: Sentences and Dialects	
or SPAN 239	Hispanic Linguistics	

One elective chosen from:		**1**
any course in LING or		
any 300-level course, beyond that required for a language major, in a language other than English (if not offered in that program, a 200-level or independent study) or		
PHIL 227	Philosophy of Language	

In addition to course work, a student wishing to declare a translation studies minor must also demonstrate high intermediate level language proficiency in the most commonly taught languages (ACTFL Category 1, 2 - French, Italian, Spanish, German); or low intermediate for less commonly taught languages (ACTFL Categories 3, 4 - Greek, Latin, Hebrew, Russian, Arabic, Chinese and Japanese).

Students who are native speakers of a language other than English who wish to declare a translation studies minor are exempt from the language proficiency requirement.

University Courses

Faculty

Coordinator: Bethany Collier

These courses are intended to provide an opportunity to examine problems, programs of research, plans of study and methods of learning that may not be wholly appropriate in existing departmental curricula. Thus, university courses are interdisciplinary and cross-departmental in character. Normally, university courses are open as to size, as well as method of instruction and meeting times.

University courses may be limited to first-year or upper-class students. Prerequisites for admission may or may not be designated depending upon the objectives of the particular course. The courses may be taught by one or more instructors.

Courses

UNIV 100. Psychology of Success. .5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:1.5
This course explores the psychology of success and psychological well-being. Through reading, self-reflection, discussion, and independent practice, students will explore a variety of topics including goal setting, habit formation, resilience, growth mindset, self-care, and meaning.

UNIV 110. Mindfulness Meditation. .25 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:10
This class follows the Koru program of mindfulness meditation for emerging adults. Students are introduced to the practice and science of mindfulness and learn several skills, including meditation, for managing stress and living with greater ease.

UNIV 112. Making: Past, Present & Future. 1 Credit.
Offered Occasionally; Lecture hours:3
The world of technology and design is growing faster than ever and as a result, there is an explosion of makers. In this course, we will do a deep dive into the four Industrial Revolutions and explore the integration of design, technology and entrepreneurship as it exists in today's society.

UNIV 115. Peer Education as Interpersonal Violence Prevention. .5 Credits.
Offered Both Fall and Spring; Lecture hours:3
Campus interpersonal violence has been recognized by the government, university administrations, and students themselves as a cause for concern. This course will provide an exploration of this issue. Students who take this course will be eligible to apply for employment with the Office of Interpersonal Violence Prevention and Advocacy.

UNIV 120. Contemporary Issues in STEM. .5 Credits.
Offered Fall Semester Only; Lecture hours:1.5
Current events and issues in Science, Technology, Engineering, and Mathematics (STEM). Focus on the broad impacts of these disciplines, and in particular identifying the decisions and structures that create or perpetuate inequities. Course work will include reading, writing, discussion and oral presentations.

UNIV 125. Exploring Pre-Health. .25 Credits.
Offered Fall Semester Only; Lecture hours:1
This introductory course is designed to introduce early-career undergraduates to the breadth of the health professions and the careers that can be pursued as well as tactics to set a path to their goals.

UNIV 126. Pursuing Pre-Health. .25 Credits.
Offered Spring Semester Only; Lecture hours:1
This introductory course is designed to guide upper-class undergraduates through the process(es) necessary to apply to the professional school of their choice.

UNIV 135. Exploring Pre-Law. .25 Credits.
Offered Spring Semester Only; Lecture hours:1
This introductory course is designed to introduce early-career undergraduates to the field of law and the legal profession, as well as give students a chance to reflect on what a career in law would involve.

UNIV 136. Pursuing Pre-Law. .25 Credits.
Offered Fall Semester Only; Lecture hours:1
This introductory course is designed to prepare upper-level undergraduates for the law school application process, decision making considerations and ultimate law school experience.

UNIV 140. Introduction to Social Science Research Methods. .5 Credits.
Offered Spring Semester Only; Lecture hours:2
This team-taught course introduces multiple methodologies employed in social science disciplines for students considering independent research or deciding between social science majors. Students will gain broad comparative knowledge about the strengths, applicability, types of data produced by various methodological approaches and how to pursue more advanced methodological training.

UNIV 150. London Internship. 1 Credit.
Offered Summer Session Only; Lecture hours:Varies,Other:3
Internship required as part of the Bucknell In London Internship Program.

UNIV 175. JumpStart Your Career. .5 Credits.
Offered Both Fall and Spring; Lecture hours:3
Learn fundamentals of good career decision making by exploring and creating a personalized plan to identify and develop skills, interests and career goals. Understand employer expectations, professional etiquette and how to make important networking connections. Learn how to best prepare for a broad range of careers and industries.

UNIV 180. Arts Live. .25-.5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Students attend in a minimum number of live arts events on campus; meet an hour each week for informal discussions in addition to posting reflective blog responses for each event. Through immersion in live arts happening, students unpack history, culture, preferences and learn to articulate aesthetic experiences with peers.

UNIV 190. Community Engaged Leadership. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2
The foundational Leadership Course for the Community Engaged Leadership minor is an introduction to leadership in community engagement (applied learning). Preference is to take UNIV 190 prior to UNIV 191.

UNIV 191. Community Engaged Practice. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2; Repeatable
Community Engaged Practice is an active learning experience that complements UNIV 190. Students enrolled in this course will be working in a community service project, approved by the Office of Civic Engagement. Preference is to take UNIV 190 prior to UNIV 191.

UNIV 192. Food, Faith, Justice: Baltimore. .5 Credits.
Offered Spring Semester Only; Lecture hours:1.5,Other:1.5
A two-part course - A seven-week educational preparatory period in which we examine relevant literature and begin to unpack the various interconnected questions of food, justice, poverty, and race in a major American city, followed by a 7-day immersive service-learning experience which will take place during the spring break.

UNIV 193. Teaching Assistant for Food, Faith, Justice: Baltimore. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:1; Repeatable
Planning community engagement and cohort development with the Food, Faith, Justice: Baltimore spring course. Pre-requisite: UNIV 192.

UNIV 199. Arts Leadership: Survey. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
This course introduces students to the professional practices and functional areas in the field of arts management and leadership, focusing on non-profit organizations in the visual, literary and performing arts. Course time is divided between classroom instruction and required attendance at weekly evening arts events on campus.

UNIV 1NT. Internship Credit. .25 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Partial credit for nonpaid internship experiences. Requires submission of proposal to the UNIV 1NT coordinator and approval of proposal prior to enrollment. May repeat only once for a total of .5 credit. Prerequisites: permission of the coordinator and permission of the instructor.

UNIV 200. Integrated Perspectives Course. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:3
Team-taught interdisciplinary course. Topics vary.

UNIV 201. Arts Leadership: Museums. 1 Credit.
Offered Spring Semester Only; Lecture hours:1,Other:2
Providing an introduction to Museum Studies and Curatorial Studies, this course covers the history and practices of museums. It reveals how museums perform social memory functions like collection and preservation in the broader field of cultural heritage institutions. It explores museum curating and cultural programming in comparative arts presenting organizations. Crosslisted as ARTH 202.

UNIV 205. Confounding Problems. .25-.5 Credits.
Offered Occasionally; Lecture hours:Varies; Repeatable
Confounding problems are large-scale problems that have multiple causes and forms of expression, and no single answers. This course (a "teach-in") will respond to such a problem and how the arts and humanities can consider its complexity and context. Issues and approaches will vary.

UNIV 209. Tasting France: The Science and Culture of Terroir. 1 Credit.
Offered Summer Session Only; Lecture hours:5,Other:10
We will explore the relationship between food and identity. Specifically, we will study the importance in France of “terroir” product– local agricultural products that conform to a particular set of geographical, geological, biological, historical, and cultural norms and traditions–from a cultural and scientific perspective. Prerequisite: permission of the instructor.

UNIV 211. Arts Leadership: Internship. .5 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Other:3
Directed study in tandem with a student-secured off-campus internship in arts leadership/administration with a minimum of 60 hours on site. Internship must be secured before enrollment in the spring and conducted during summer. Course takes place during the first half of fall semester.

UNIV 213. Science & Engineering of Music & Sound. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Exploration of how musical instruments work, including timbre and pitch control and related concepts such as scales and temperament. Fundamental concepts of acoustics, such as frequency, wavelength, resonance, sound pressure level, the decibel unit and human perception of sound. Fundamentals of sound recording and reproduction systems.

UNIV 215. Stream Ecology and Restoration: The Science Behind Fly Fishing. 1 Credit.
Lecture hours:3,Lab:3
Introduction to the interactions between water quality, hydrology, and aquatic ecosystems and their impact on stream ecosystem health. Stream restoration concepts will be studied including impacts of climate change, invasive species and land use. Fly fishing will be used as the common thread that ties these topics together. Crosslisted as ENST 212.

UNIV 220. Technology & Social Justice. 1 Credit.
Offered Occasionally; Lecture hours:3
Technology impacts our daily lives and natural environment, but very few of us participate in the design process and technological decision making. This course explores the ways in which technology impacts marginalized voices and underrepresented communities through the lenses of design and existing power structures.

UNIV 225. Introduction to Public Policy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to the study of public policy, including methods to identify social problems, analysis of the political process, policy analysis, and how individuals and institutions respond to policy using a variety of social science disciplines.

UNIV 226. New Orleans in 12 Movements. 1 Credit.
Offered Summer Session Only; Lecture hours:24,Other:33
Compares 12 movements in the history of N.O.L.A. (Civil War, Louisiana Purchase, birth of Jazz) and its relationship to the Mississippi. Prerequisite: permission of the instructor. Crosslisted with MUSC 317.

UNIV 232. Science, Technology and Society. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
This is an “Inside-Out” course that is taught in a local prison with both Bucknell and incarcerated students. Topics include the processes of science, the motivations of the people who study science, and the effects (both positive and negative) of science and technology on everyday people.

UNIV 235. Engineering Car Design. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:2; Repeatable
The Chem-E Car Competition challenges interdisciplinary teams to design, build, and compete with a shoe box sized vehicle that must travel a specified distance carrying a specific load in under two minutes and stop closest to the finish line. Interdisciplinary student teams design and build these cars. Crosslisted as CHEG 230.

UNIV 236. Israel: Literature, Film, Culture. 1 Credit.
Offered Alternating Spring Semester; Lecture hours:3
Course explores Israeli culture in its historical, ethnic, religious, linguistic, and geographical context through literature, film, political discourse, photography, and other texts. Crosslisted as HEBR 236.

UNIV 239. Working with Writers: Theory and Practice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Theory and Practice. An exploration of the social and intellectual dynamics of the writing and tutoring process. Prerequisite: permission of the instructor.

UNIV 243. Placing the Past. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Through the integration and utilization of geographical and historical thinking, this course encourages students to explore forgotten, marginalized, and occluded moments in place and time, from the perspective of considering their potential significance and usefulness in the contemporary period. Crosslisted as GEOG 243 and HIST 243.

UNIV 248. Intermediality: Italy, Film, and the Arts. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
This IP course will focus on intermediality, film, and Italy. It seeks to examine the relationships of cinema with the other arts, in particular the arts of Italy. Crosslisted as ITAL 248.

UNIV 251. Weird Art, Weird Poetry: Criticism, Creativity, and Social Life. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
IP Course: Team#taught exploration of art, language, and society in the twentieth century and today. Following the study of art and writing in Dada, Surrealism, and Fluxus, students will construct their own works of art and poetry as well as write collective manifestos and works of critical analysis.

UNIV 263. The Jewish Uprooted. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
The course explores the figure of the uprooted in modern Jewish literature and culture, focusing on early 20th-century Hebrew, Yiddish, and Jewish-American writing (readings are in English). Crosslisted as HEBR 251.

UNIV 264. Materials Science. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Study of the behavior of materials and the relationships between structure and properties of materials including metals, ceramics, and polymers. With experimental laboratory including measurements, modifications, and fracture of materials. Discussions of how materials are selected for different applications based on properties, processing, and societal considerations.

UNIV 284. South Africa: Social Entrepreneurship. 1 Credit.
Offered Summer Session Only; Lecture hours:15
The course examines the legacy of apartheid and the role of social entrepreneurship in transforming communities. Students will be placed in community organizations in nearby townships. Prerequisite: permission of the instructor. Crosslisted as ECON 270.

UNIV 292. After the Holocaust: Israel & United States. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course examines the impact of the Nazi persecution and genocide against the Jews (1933-1945) on different societies and cultures post-1945, especially in Israel and the United States. Crosslisted as HEBR 292.

UNIV 294. Pharmaceuticals Vaccines Food and Drink in London. 1 Credit.
Offered Occasionally; Lecture hours:2,Other:2
This course will explore case studies combining the technical, social and cultural aspects of chemical and biochemical processes to form food and pharmaceutical products through the context of study in London.

UNIV 296. Lessons in Resistance: MLK to 2021. .5 Credits.
Offered Spring Semester Only; Lecture hours:1.5
The course focuses requires students to 1) do several focused readings; 2) attend a series of campus lectures related to contemporary issues of social justice and ethical leadership as well as the historical Civil Rights movement symbolically commemorated in MLK day/week/month; and 3) discuss and reflect in weekly meetings.

UNIV 297. Experiential Learning in London and Beyond. .25 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:1; Repeatable
In this course, students will process and deepen the experiential learning that is a central part of the Bucknell in London program. After site visits, field trips and excursions within London and beyond, students will write reflections regarding the nature and importance of these learning experiences. Core course for program.

UNIV 299. Race and Ethnicity after Technology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A critical exploration of the role of race and ethnicity as they intersect with gender, sexuality, ability, class and other aspects of a person's identity, in the production, consumption, and representation of technology.

UNIV 2NT. University Non-traditional Study. 1-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies; Repeatable
Non-traditional study course. Prerequisite: permission of the instructor.

UNIV 301. From Colonisation to Climate Crisis: Australian Life, Identity, and Change. 1 Credit.
Offered Occasionally; Lecture hours:3
You will acquire a broad knowledge of key social developments in Australia since colonisation, and to assess the effects these developments have had on contemporary Australian culture and identity. By learning about and analysing the events, lives, cultures and changes in Australia since colonisation.

UNIV 305. Topics in Pharmaceuticals for the Future. .25 Credits.
Offered Either Fall or Spring; Lecture hours:1; Repeatable
An interdisciplinary consideration of the technical, social, economic and ethical challenges and opportunities related to pharmaceuticals. Emphasis varies by semester, but often will include aspects of development, cost, access and regulations.

UNIV 338. Preparing for Advanced Degrees. .25 Credits.
Offered Fall Semester Only; Lecture hours:1
Self-reflection and strategies for students preparing applications for master's and Ph.D. programs in all disciplines but not professional school. Contemporary issues in higher education. Weekly writing assignments and peer review. Prerequisite: senior standing. 0.25 credit, Fall only.

UNIV 340. Social Science Honors Thesis Preparation. .5 Credits.
Offered Fall Semester Only; Lecture hours:1.5; Repeatable
Overview course that provides weekly structure to social science students writing Honors Theses. Students gain oversight in conceptualizing, writing and submitting Honors Thesis proposals. Instruction devoted to setting concrete research goals to be completed during the semester, writing the 'literature review' chapter, and constructing a timeline for the spring semester.

UNIV 371. Dance, Culture and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of dance as cultural and political practice. Topics include: colonialism; the politics of tradition; gender, ethnicity, and nationalism; dance and violence. Prerequisites: not open to first-year students or students who have taken ANTH 271 or WMST 271 Dance and Culture. Crosslisted as ANTH 371 and WMST 371.

UNIV 3NT. University Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study course.

Women's & Gender Studies

Faculty

Professors: Coralynn V. Davis, James Mark Shields

Associate Professors: Erica Delsandro (Chair), Susan A. Reed

Assistant Professor: Katharine McCabe

Visiting Assistant Professor: Rachel A Trusty

Adjunct: Elena Perez-Zetune

Coordinating Committee: Katherine Bermingham (Political Science), Coralynn V. Davis (Women's & Gender Studies), Erica Delsandro (Women's & Gender Studies), William F. Flack (Psychology), Stephanie Larson (Classics & Ancient Mediterranean Studies), Sheila M. Lintott (Philosophy), Sarah K. MacKenzie-Dawson (Education), Vanessa A. Massaro (Geography), Collin McKinney (Spanish), Adrian N. Mulligan (Geography), Anna Paparcone (Languages, Cultures & Linguistics-Italian), John Penniman (Religious Studies), Susan A. Reed (Women's & Gender Studies), Rachel A Trusty (Women's & Gender Studies), Bryan Vandevender (Theatre & Dance), Christina Xydias (Political Science)

Women's & gender studies is an interdisciplinary academic field that examines the complex ways gender interacts with other identity vectors such as race, sexuality, class, ability, nation and religion. While the field historically focused on women's lives and experiences, women's & gender studies today also centers on the analysis of interlocking systems of oppression and privilege, thus prioritizing intersectional frameworks for studying the broad spectrum of gender and sexuality. The field frames questions of gender and feminisms in ways that connect the local to the global and promote an understanding of the relations of power in multiple political, social, cultural and international contexts. Because women's & gender studies prioritizes praxis, questions of equity and inclusion are integral to research, teaching and service within the field. The Department of Women's & Gender Studies at Bucknell exposes students to a wide range of critical perspectives, methodological approaches and research tools in service of exploring the social construction of gender as we experience it today in the U.S. as well as in different cultural environments and at different historical moments.

Faculty members are drawn from many departments across campus. As recognized scholars in their chosen field with a special interest in women's issues, they are frequent authors of books and articles on gender and participate regularly in professional conferences on topics relevant to women's & gender studies. Drawing on these scholarly activities, faculty expose students to issues in the field.

Women's & gender studies offers a background for careers in fields such as: journalism, law, international affairs, teaching, personnel management, public and private corporations, and local and state agencies, especially those addressing the needs of girls and women.

Major in Women's & Gender Studies

The minimum requirement for a **major** in women's & gender studies is eight courses. No more than two 100-level courses may count toward the major. Students majoring in women's & gender studies must distribute their courses as follows:

WMST 150	Introduction to Women's and Gender Studies [1]	1
Select one of the following:		1
WMST 220	Feminist Thought and Action [2]	
WMST/PHIL 230	Feminist Philosophy [2]	
Select one of the following global courses:		1
WMST 221/EAST 222	Passion/Perversion: Japan Film	
WMST/ECON 224	African Women & Social Action	
WMST/ANTH 232	Gender and Sexuality in South Asia	
WMST/ANTH 251	Gender, Power and Global Development	
WMST/RELI 260	Women, Gender, Islam	
WMST/HIST 277	Gender in Africa	
WMST 338	Women in Ancient Rome	
WMST/UNIV 371	Dance, Culture and Power	
HIST 260	Black Women's History	
POLS 380	Seminar in International Politics (Gender and International Relations)	
Select one of the following courses with a focus on the United States:		1
WMST 218	Latina Feminisms in US	
WMST 222	Queer Studies	
WMST/CBST 227	Race and Sexuality	
WMST/ENFS 235	Gender and Film/Media	
WMST 262	Gender, Race and Health	
WMST 317	Carceral Landscapes: Understanding Geographies of Punishment, Policing and Detention	
WMST 318/ECON 319	Economic History of Women in the United States	
WMST/SOCI 328	Mating and Marrying in America	
WMST/ANTH 332	Women & the Penal System	
WMST 333	Black Feminisms	
WMST 350	Reproductive Justice & Health	
ENLS 288	Studies in Contemporary Literature (Women Writers of Color)	
Three courses from the women's & gender studies approved course list selected in consultation with a women's & gender studies adviser.		3
WMST 400	Advanced Seminar in Women's and Gender Studies [3]	1

1 The Department of Women's & Gender Studies urges majors to take WMST 150 Introduction to Women's and Gender Studies as early as possible in their major coursework, as this requirement is designed to introduce students to a number of important subject areas that may be studied in greater depth in subsequent courses. This course includes formal instruction in information literacy within the major.

2 The Department of Women's & Gender Studies urges majors to take WMST 220 Feminist Thought and Action or WMST 230 Feminist Philosophy/PHIL 230 Feminist Philosophy relatively early in their major coursework, as this requirement is designed to introduce students to a number of theoretical developments in the field that will be explored further in subsequent courses. These courses include formal instruction in writing within the major.

3 WMST 400 Advanced Seminar in Women's and Gender Studies serves as the Culminating Experience (CE) for majors. Organized on a "workshop" model, the seminar will focus on the production of an independent research project by each student with common readings on the practice of feminist scholarship. The seminar will take students through the steps of defining a question, producing an extensive bibliography and literature review on the topic, constructing an argument of their own that is grounded in feminist theory, and supporting it with evidence drawn from primary or secondary materials. Students will develop and give formal presentations of their projects.

Study off campus and/or abroad is strongly encouraged for both majors and minors in women's & gender studies. Internships and field experience also are possible for course credit but should be planned and approved at least six months in advance of the semester in which they are to be taken.

In exceptional cases, if a student is unable to fulfill the global focus or U.S. focus requirement by taking one of the listed courses, they may request from the chair of the department a substitution of another course. For WGS majors, the substitution must be approved by the student's adviser and the chair of the department. For WGS minors, the substitution must be approved by the chair of the department.

Women's & gender studies majors may participate in the honors program subject to the general guidelines of the University Honors Council. Applications should be made to the Women's & Gender Studies Coordinating Committee after selecting an honors adviser from among the women's & gender studies faculty.

Women's & Gender Studies Course List

The following courses are approved for the women's & gender studies major and minor.

WMST 150	Introduction to Women's and Gender Studies	1
WMST/EAST 208	The Red Brush: Women Writers in Imperial China	1
WMST/LAMS 218	Latina Feminisms in US	1
WMST 220	Feminist Thought and Action	1
WMST 221/EAST 222	Passion/Perversion: Japan Film	1
WMST 222	Queer Studies	1
WMST 223	Feminist Care, Joy, & Transformation	1
WMST/ECON 224	African Women & Social Action	1
WMST 225/ENLS 239	Reading Race, Gender and Sexuality	1
WMST/CBST 227	Race and Sexuality	1
WMST/PHIL 230	Feminist Philosophy	1
WMST/ANTH 232	Gender and Sexuality in South Asia	1
WMST/ENFS 235	Gender and Film/Media	1
WMST 245/CLAS 235/RELI 253	Dying for God: Martyrdom from Antigone to ISIS	1
WMST/ANTH 251	Gender, Power and Global Development	1
WMST/RELI 260	Women, Gender, Islam	1
WMST 262	Gender, Race and Health	1
WMST 266	Women Writing/Writing Women: Literature and Feminist Theory	1
WMST/POLS 269	Feminist Political Theory	1
WMST 270	Special Topics in Women's and Gender Studies (Feminist & LGBTQ+ Art)	1
WMST 272	Latina Girlhood: Coming of Age	1
WMST/HIST 277/IREL 273	Gender in Africa	1
WMST 280	Feminist Literary Theory	1
WMST/EDUC 290	Gender Issues in Education	1
WMST/GEOG/ENST 305	Gender, Environment & Health	1
WMST/GEOG 316	Geographies of Nationalism	1
WMST/GEOG 317	Carceral Landscapes: Understanding Geographies of Punishment, Policing and Detention	1
WMST 318/ECON 319	Economic History of Women in the United States	1
WMST 320	Independent Studies	1
WMST/GEOG 324	Geographies of Identity	1
WMST 325/HUMN 320	History of Sexuality	1
WMST/SOCI 328	Mating and Marrying in America	1
WMST/ANTH 332	Women & the Penal System	1
WMST 333	Black Feminisms	1
WMST/CLAS 334	Women in Antiquity	1
WMST/CLAS 338	Women in Ancient Rome	1
WMST 350	Reproductive Justice & Health	1
WMST 370	Special Topics in Women's and Gender Studies (Literature of Flirtation; Nineteenth-century Women Writers)	1
WMST/UNIV 371	Dance, Culture and Power	1
WMST 390	Honors in Women's and Gender Studies	1
WMST 400	Advanced Seminar in Women's and Gender Studies	1
CLAS 250	Topic in Classics (Sexuality and Eros in Antiquity)	1
CLAS 350	Seminar on a Classical Topic (Women in the Ancient World)	1
ENLS 203	Introduction to Race and Literature (Queerness and Race)	1
ENLS 213	Special Topics in American Literature (Fiction and Reproductive Justice)	1
ENLS 228	Gender and Sexuality in America (Divas, Drag and Dirt: Camp Style and Identity)	1

ENLS 270	Romantic Literature, 1780-1832 (Strange Fits of Passion)	1
ENLS 271	Studies in 19th-century English Literature	1
ENLS 288	Studies in Contemporary Literature (Women Writers of Color)	1
ENLS 370	Seminar in 19th-century English Literature (Literature of Flirtation; Nineteenth-century Women Writers)	1
ENLS 393	Seminar in Contemporary Drama (Feminism and Theatre)	1
ENLS 394	History of Sexuality in Literature (History of Sexuality in Literature)	1
FREN 220	Women's Voices In Early Modern France (Pre-Revolutionary Women)	1
FREN 395	Seminar in French or Francophone Studies (Ecrivaines Francophones; Women's Cinema)	1
GEOG 201	Special Topics in Geography (Geographies of Justice)	1
GEOG 318	Geographies of Justice, Globalization and Sustainability	1
HIST 247	Topics in European History (Witches, Wenches and Wives)	1
HIST 258	Topics in Women's and Gender History (Notions of Gender in Early Modern Europe)	1
HIST 260	Black Women's History	1
HIST 279	Topics in the History of Science and Medicine (Sex, Race, Science)	1
HIST 370	History of Science and Medicine (Early Modern Body)	1
HUMN 270	Data Visualization for the Digital Humanities	1
POLS 213	Gender and Politics in Comparative Perspective	1
POLS 290	Topics in Politics (Arendt, Beauvoir and Patriarchy)	1
POLS 380	Seminar in International Politics (Gender and International Relations)	1
POLS 388	Gender & International Relations	1
PSYC 306	Critical Trauma Psychology	1
SOCI 241	Marriages and Families in the 21st Century	1
SPAN 322	Modern Spanish Literature (Spanish Women Writers)	1

Minor in Women's & Gender Studies

The **minor** in women's & gender studies requires five courses:

WMST 150	Introduction to Women's and Gender Studies	1
Select one of the following courses with a theory or global focus:		1
WMST 220	Feminist Thought and Action	
WMST 221/EAST 222	Passion/Perversion: Japan Film	
WMST/ECON 224	African Women & Social Action	
WMST/PHIL 230	Feminist Philosophy	
WMST/ANTH 232	Gender and Sexuality in South Asia	
WMST/ANTH 251	Gender, Power and Global Development	
WMST/RELI 260	Women, Gender, Islam	
WMST/HIST 277	Gender in Africa	
WMST 338	Women in Ancient Rome	
WMST/UNIV 371	Dance, Culture and Power	
HIST 260	Black Women's History	
POLS 380	Seminar in International Politics (Gender and International Relations)	
Select one of the following courses with a focus on the United States:		1
WMST 218	Latina Feminisms in US	
WMST 222	Queer Studies	
WMST/CBST 227	Race and Sexuality	
WMST/ENFS 235	Gender and Film/Media	
WMST 262	Gender, Race and Health	
WMST 317	Carceral Landscapes: Understanding Geographies of Punishment, Policing and Detention	
WMST 318/ECON 319	Economic History of Women in the United States	
WMST/SOCI 328	Mating and Marrying in America	
WMST/ANTH 332	Women & the Penal System	
WMST 333	Black Feminisms	
WMST 350	Reproductive Justice & Health	

ENLS 288	Studies in Contemporary Literature (Women and the Literature of Migration)	
Two courses from the women's & gender studies approved list		2

Study off campus and/or abroad is strongly encouraged for both majors and minors in women's & gender studies. Internships and field experience also are possible for course credit but should be planned and approved at least six months in advance of the semester in which they are to be taken.

In exceptional cases, if a student is unable to fulfill the global focus or U.S. focus requirement by taking one of the listed courses, they may request from the chair of the department a substitution of another course. For WGS majors, the substitution must be approved by both the student's adviser and the chair of the department. For WGS minors, the substitution must be approved by the chair of the department.

Students wishing to declare a women's & gender studies major or minor should contact a women's & gender studies adviser.

Women's & Gender Studies Course List

The following courses are approved for the women's & gender studies major and minor.

WMST 150	Introduction to Women's and Gender Studies	1
WMST/EAST 208	The Red Brush: Women Writers in Imperial China	1
WMST/LAMS 218	Latina Feminisms in US	1
WMST 220	Feminist Thought and Action	1
WMST 221/EAST 222	Passion/Perversion: Japan Film	1
WMST 222	Queer Studies	1
WMST 223	Feminist Care, Joy, & Transformation	1
WMST/ECON 224	African Women & Social Action	1
WMST 225/ENLS 239	Reading Race, Gender and Sexuality	1
WMST/CBST 227	Race and Sexuality	1
WMST/PHIL 230	Feminist Philosophy	1
WMST/ANTH 232	Gender and Sexuality in South Asia	1
WMST/ENFS 235	Gender and Film/Media	1
WMST 245/CLAS 235/RELI 253	Dying for God: Martyrdom from Antigone to ISIS	1
WMST/ANTH 251	Gender, Power and Global Development	1
WMST/RELI 260	Women, Gender, Islam	1
WMST 262	Gender, Race and Health	1
WMST 266	Women Writing/Writing Women: Literature and Feminist Theory	1
WMST/POLS 269	Feminist Political Theory	1
WMST 270	Special Topics in Women's and Gender Studies (Race, Gender and Citizenship; Feminist & LGBTQ+ Art)	1
WMST 272	Latina Girlhood: Coming of Age	1
WMST/HIST 277/IREL 273	Gender in Africa	1
WMST 280	Feminist Literary Theory	1
WMST/EDUC 290	Gender Issues in Education	1
WMST/GEOG/ENST 305	Gender, Environment & Health	1
WMST/GEOG 316	Geographies of Nationalism	1
WMST/GEOG 317	Carceral Landscapes: Understanding Geographies of Punishment, Policing and Detention	1
WMST 318/ECON 319	Economic History of Women in the United States	1
WMST 320	Independent Studies	1
WMST/GEOG 324	Geographies of Identity	1
WMST 325/HUMN 320	History of Sexuality	1
WMST/SOCI 328	Mating and Marrying in America	1
WMST/ANTH 332	Women & the Penal System	1
WMST 333	Black Feminisms	1
WMST/CLAS 334	Women in Antiquity	1
WMST/CLAS 338	Women in Ancient Rome	1
WMST 350	Reproductive Justice & Health	1
WMST 370	Special Topics in Women's and Gender Studies (Nineteenth-century Women Writers; Literature of Flirtation)	1
WMST/UNIV 371	Dance, Culture and Power	1

WMST 390	Honors in Women’s and Gender Studies	1
WMST 400	Advanced Seminar in Women’s and Gender Studies	1
CLAS 250	Topic in Classics (Sexuality and Eros in Antiquity)	1
CLAS 350	Seminar on a Classical Topic (Women in the Ancient World)	1
ENLS 203	Introduction to Race and Literature (Queerness and Race)	1
ENLS 213	Special Topics in American Literature (Fiction and Reproductive Justice)	1
ENLS 228	Gender and Sexuality in America (Divas, Drag and Dirt: Camp Style and Identity)	1
ENLS 270	Romantic Literature, 1780-1832 (Strange Fits of Passion)	1
ENLS 271	Studies in 19th-century English Literature	1
ENLS 288	Studies in Contemporary Literature (Women Writers of Color)	1
ENLS 370	Seminar in 19th-century English Literature (Nineteenth-century Women Writers)	1
ENLS 393	Seminar in Contemporary Drama (Feminism and Theatre)	1
ENLS 394	History of Sexuality in Literature	1
FREN 220	Women’s Voices In Early Modern France (Pre-Revolutionary Women)	1
FREN 395	Seminar in French or Francophone Studies (Women’s Cinema; Ecrivaines Francophones)	1
GEOG 201	Special Topics in Geography (Geographies of Justice)	1
GEOG 318	Geographies of Justice, Globalization and Sustainability	1
HIST 247	Topics in European History (Witches, Wenches, and Wives; Women in Early Modern Europe)	1
HIST 258	Topics in Women's and Gender History (Notions of Gender in Early Modern Europe)	1
HIST 260	Black Women's History	1
HIST 279	Topics in the History of Science and Medicine (Sex, Race, Science)	1
HIST 370	History of Science and Medicine (Early Modern Body)	1
HUMN 270	Data Visualization for the Digital Humanities	1
POLS 213	Gender and Politics in Comparative Perspective	1
POLS 290	Topics in Politics (Arendt, Beauvoir and Patriarchy)	1
POLS 380	Seminar in International Politics (Gendering International Relations)	1
POLS 388	Gender & International Relations	1
PSYC 306	Critical Trauma Psychology	1
SOCI 241	Marriages and Families in the 21st Century	1
SPAN 322	Modern Spanish Literature (Spanish Women Writers)	1

Upon graduation, women’s & gender studies majors will:

1. Cultivate knowledge of women’s lives, historically and in the present, in the U.S. and in other cultural contexts.
2. Develop analytical facility with key women's & gender studies concepts, including gender, sexuality, sexism, patriarchy, intersectionality, privilege and oppression.
3. Cultivate knowledge of the range of, and key debates in, feminist theory.

Courses

WMST 150. Introduction to Women's and Gender Studies. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3
Interdisciplinary introduction to the major theories, themes, and issues of women's and gender studies.

WMST 208. The Red Brush: Women Writers in Imperial China. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course we explore the writings of Chinese women from the 1st to the early 20th centuries, and discuss the changing social and historical contexts within which these women wrote, and the obstacles these women writers had to overcome in order to ensure that their voices were heard. Crosslisted as EAST 208.

WMST 218. Latina Feminisms in US. 1 Credit.
Offered Occasionally; Lecture hours:3
This course examines the various experiences, perspectives and expressions of Latinas in the United States, which vary according to gender, sexuality, race, citizenship, region and language. Crosslisted as GEOG 208 and LAMS 218.

WMST 220. Feminist Thought and Action. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explore the broad range of work that lays the intellectual and theoretical groundwork for contemporary feminist theory and politics, while providing student opportunities to experience such work critically through service learning experiences in the community. Prerequisite: WMST 150 or permission of the instructor.

WMST 221. Passion/Perversion: Japan Film. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:3
A discussion class in which numerous modern Japanese films are used to explore the representation of desire, both passionate and perverse. WARNING: explicit sexual content. Crosslisted as EAST 222.

WMST 222. Queer Studies. 1 Credit.
Offered Alternating Fall Semester; Lecture hours:3
This course examines social construction frameworks for analyzing contemporary sexualities, gendered identities, and the discourses and practices that maintain them. It introduces students to queer theory and its application to a variety of political and cultural fields.

WMST 223. Feminist Care, Joy, & Transformation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The class uses feminist theory to examine emotions, survival, and activism in times of crisis. Key topics will include anger, self-care and community-care, mutual aid, disability justice, the politics of pleasure and joy and feminists approaches to working for change.

WMST 224. African Women & Social Action. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Analysis of topics in films and novels by Ousmane Sembene: pre-colonial history, colonialism, post-colonial independence, racial and gender oppression, worker exploitation, religious conflict, and modernization. Prerequisites: ECON 101 or permission of the instructor. Crosslisted as ECON 224.

WMST 225. Reading Race, Gender and Sexuality. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Exploiting the exclusionary nature of "High Modernism," this course highlights literature on the margins of modernism, revealing literature's political investment in race, class, and sexuality. Crosslisted as ENLS 239.

WMST 227. Race and Sexuality. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
This course explores the constructions of and intersections between race and sexuality. It also investigates the ways that these identities/locations have informed understanding of inequality in the U.S. Crosslisted as CBST 227.

WMST 230. Feminist Philosophy. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of feminist philosophy primarily as it occurs in the U.S. from the late 18th century to the present. Crosslisted as PHIL 230.

WMST 232. Gender and Sexuality in South Asia. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores issues of gender and sexuality in South Asia, primarily India and Sri Lanka. Topics include marriage, family, life cycle, religion and nationalism. Crosslisted as ANTH 232.

WMST 235. Gender and Film/Media. 1 Credit.
Lecture hours:3
Current debates about gender and American film, from WW II to the present. Diverse critical approaches for interpreting film within the broad context of gender studies. Crosslisted as ENFS 235.

WMST 245. Dying for God: Martyrdom from Antigone to ISIS. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Early Christians were attracted to dramatic narratives of suffering--whether about spectacular deaths in the arena or extreme self-denial in the desert. This course explores the world of martyrs and monks and considers how ancient ideals about pain, gender, and sexuality continue to influence Christian thinking about holiness and sainthood. Crosslisted as CLAS 235 and RELI 253.

WMST 251. Gender, Power and Global Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines the relationship between women and development, as an ideological, economic, political, and social enterprise. Crosslisted as ANTH 251.

WMST 260. Women, Gender, Islam. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of how Muslims have conceived of and performed gender, both historically and today. Counter to the trope that “Islam oppresses women,” we will consider an array of gendered dynamics that characterize Muslim societies. We will also examine the geopolitical contexts that contribute to this trope to begin with. Crosslisted as RELI 260.

WMST 262. Gender, Race and Health. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will introduce students to gender and race as theoretical concepts and categories of analysis in public health. Using an interdisciplinary and intersectional approach, it will explore the ways that gender and race have contributed to differentially structuring people's experiences and expectations of health.

WMST 266. Women Writing/Writing Women: Literature and Feminist Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to feminist thought with a special emphasis on the way in which women theorize their gender through writing and the way gender intersects with other identity categories such as race, class and sexuality in literature. Crosslisted as ENLS 266.

WMST 269. Feminist Political Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of how various feminist ideas, commitments and critiques alter how we understand fundamental concepts and problems in political theory, such as the nature of justice, the function of political community, the foundation of rights, the definition of freedom and who is deserving of political rule. Crosslisted as POLS 269.

WMST 270. Special Topics in Women's and Gender Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
A course on special topics of interest to faculty members, offered occasionally. Subject varies.

WMST 272. Latina Girlhood: Coming of Age. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Latina girls make up more than one in five girls aged 5–17 and increasing. Despite this increasing demographic, the level of inclusion of Latina girls in academic scholarship and traditional media remains low. This course focuses on representations of Latina in the U.S. through the lens of girlhood/coming of age. Crosslisted as LAMS 272.

WMST 277. Gender in Africa. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines gender and sexuality in Africa historically and contemporarily, using an examination of Africanist gender theory along with a critical examination of Western conventional categories and a critical approach to issues of family, generational tensions, sexuality, and power as useful ways for thinking through change in African history. Crosslisted as HIST 277 and IREL 273.

WMST 280. Feminist Literary Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Feminist Literary Theory provides an introduction to feminist methodologies in literary studies particularly and in the humanities generally. The course centers a historical and intersectional approach to the theorization of gendered authorship.

WMST 290. Gender Issues in Education. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An examination of how gender affects the teaching-learning process with an emphasis on theory, curriculum, pedagogy, and assessment. Crosslisted as EDUC 290.

WMST 305. Gender, Environment & Health. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores how gender (intersecting with other identities) shapes interactions with the environment and related health outcomes. We will attend to multiple forms of power structures that enable and constrain possibilities of well-being. Crosslisted as ENST 305 and GEOG 305.

WMST 316. Geographies of Nationalism. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course explores nationalism and its increasing popularity by considering it geographically; for example, its dynamic scalar dimensions, its forging of race and gender spatially, and its naturalization in landscape and built form. In so doing, we will critically consider those interests that nationalism serves. Crosslisted as GEOG 316.

WMST 317. Carceral Landscapes: Understanding Geographies of Punishment, Policing and Detention. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will examine how power systems of control and confinement reverberate to reshape society and space. This course will investigate the cultural landscape produced by drives to punish and confine populations, especially drives based on race, gender presentation, and citizenship status. Crosslisted as GEOG 317.

WMST 318. Economic History of Women in the United States. 1 Credit.
Offered Occasionally; Lecture hours:3
Examination of the history of women in the U.S. economy, with particular attention to racial-ethnic and class differences among women. Prerequisites: ECON 202 or ECON 203 or ECON 204. Crosslisted as ECON 319.

WMST 320. Independent Studies. 1 Credit.
Offered Both Fall and Spring; Lecture hours:Varies,Other:3; Repeatable
Independent study supervised by Women's and Gender Studies faculty member. Prerequisite: permission of the instructor.

WMST 324. Geographies of Identity. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Who are "we"? Seminar considers role of space in constituting society around the world. Explores nationalism, globalization, multiculturalism, citizenship, race, ethnicity, gender, sexuality, age, disability. Crosslisted as GEOG 324.

WMST 325. History of Sexuality. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A cross-cultural and interdisciplinary examination of the signification of sexuality in literature, philosophy, scientific discourse, and the visual arts. Prerequisite: WMST 150 or permission of the instructor. Crosslisted as HUMN 320.

WMST 328. Mating and Marrying in America. 1 Credit.
Offered Alternate Fall or Spring; Lecture hours:3
This is a course on changing patterns in American courtship (dating), marriage, and family life from the 20th to the 21st century. Prerequisite: permission of the instructor. Crosslisted as SOCI 328.

WMST 332. Women & the Penal System. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
This course explores the interface between inequality, crime, punishment and justice, with an emphasis on women in the United States; the course is populated by both Bucknell students and incarcerated students at a nearby women's prison. Prerequisite: permission of the instructor. Crosslisted as ANTH 332.

WMST 333. Black Feminisms. 1 Credit.
Offered Occasionally; Lecture hours:3
This course explores the context, development, and outcomes of black feminists in the United States during the second half of the 20th century. Crosslisted as CBST 333 and WMST 633.

WMST 334. Women in Antiquity. 1 Credit.
Offered Occasionally; Lecture hours:3
Seminar-style examination of the lives of women in antiquity both real and imagined, as attested in a variety of ancient media. Crosslisted as CLAS 334. Prerequisite: permission of the instructor.

WMST 338. Women in Ancient Rome. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This class will focus on the lived experience of women in ancient Rome, including women from Roman provinces, from the founding of the city through the early Empire—a period of about 900 years. Using literary, visual and archaeological evidence, we will examine issues of agency, participation and exclusion. Crosslisted as CLAS 338.

WMST 350. Reproductive Justice & Health. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This seminar explores reproductive politics and health through the intersectional, feminist lens of reproductive justice. We will cover historical, domestic, and global struggles for reproductive autonomy, rights and care. Students will draw from interdisciplinary work in feminist studies to understand reproductive experiences across the lifecourse.

WMST 353. Gender & Migration. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on the role of gender in internal and international migrations. It covers gendered motivations for and patterns of migration; the global economy and migration, migration and families, forced migration, migration and economic restructuring, and transnational marriage and identity. Prerequisites ECON 203 or ECON 204 or WMST 150. Crosslisted as ECON 353.

WMST 370. Special Topics in Women's and Gender Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Advanced course on special topics of interest to faculty members, offered occasionally. Subject varies.

WMST 371. Dance, Culture and Power. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An exploration of dance as cultural and political practice. Topics include: colonialism; the politics of tradition; gender, ethnicity, and nationalism; dance and violence. Prerequisites: not open to first-year students or students who have taken ANTH 271 or WMST 271 Dance and Culture. Crosslisted as ANTH 371 and UNIV 371.

WMST 390. Honors in Women's and Gender Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Individual, special projects supervised by instructor, culminating in honors thesis. Prerequisite: permission of the instructor.

WMST 3NT. WMST Non-traditional Study. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies; Repeatable
Non-traditional study in WMST. Prerequisite: permission of the instructor.

WMST 400. Advanced Seminar in Women's and Gender Studies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The seminar will focus on the production of an independent research project by each student, with common readings on the practice of feminist scholarship. Students will develop and give formal presentations of their projects. Prerequisites: open to seniors, juniors by permission, WMST 150 and WMST 220 or WMST 230/PHIL 230.

COLLEGE OF ENGINEERING

The College of Engineering is dedicated to providing an exemplary engineering education to better the world. We provide students a deep and comprehensive engineering education built on a liberal arts foundation and delivered through curricular and cocurricular activities in a residential environment. We foster students' intellectual curiosity, technical mastery, self-awareness and community engagement on their journey to better the world.

Our vision is to benefit our global community by cultivating technically adept, responsible citizens who positively contribute to innovative solutions in a changing world. A Bucknell University engineering education is distinguished by its core values: a student-first approach, embrace of diverse perspectives for engineering success, transformative teaching and learning, and collaborative scholarship.

Curricula Overview (EG)

Curricula in the College of Engineering lead to the degrees of bachelor of science in the disciplines of biomedical, chemical, civil, computer, electrical, environmental and mechanical engineering, as well as the Bachelor of Science in Computer Science & Engineering. Integrated five-year liberal arts/engineering programs, leading to bachelor of science and bachelor of arts degrees or a Bachelor of Science and Bachelor of Management for Engineers degree, are also offered. In addition, students may choose to integrate their studies by concentrating their electives to pursue interests in a particular area such as biomedical or environmental engineering. The cross-disciplinary nature of these studies allows students from several disciplines to participate in available courses.

Each of the engineering programs emphasizes the fundamentals of mathematics, natural sciences and engineering science combined with specialized study in a particular discipline and broadening studies in the humanities and social sciences. Students interested in pursuing computer science as a major may do so as an option under the Bachelor of Science in Computer Science & Engineering curriculum or under the bachelor of science degree program or the bachelor of arts degree program.

Programs in Engineering

The programs leading to the degrees of bachelor of science in biomedical, computer science & engineering, chemical, civil, computer, electrical, environmental and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET (ABET.org (http://www.abet.org/)). The Bachelor of Science in Computer Science & Engineering degree program is also accredited by the Computing Accreditation Commission of ABET (ABET.org (http://www.abet.org/)). All of the programs are designed to develop in students a broad understanding of engineering disciplines, an appreciation of the engineer's individual and professional role in society, and a capacity for lifelong learning.

The undergraduate engineering programs cover four years, but in five years a student can complete a joint degree in liberal arts & engineering with a major in each college. First-year engineering students may select a specific engineering major when they enroll or remain undecided during the first semester. Engineering students may apply to change from one engineering program to another at the end of one or two semesters; later changes are more difficult but may be possible. Changes from one major program to another may be limited due to enrollment restrictions in the program. Students in the College of Arts & Sciences who apply to transfer to the College of Engineering will be subject to a review of their academic performance at Bucknell for entrance into any engineering program, and subject to enrollment limitations that may be in place in specific degree programs. Specific information may be obtained from the associate dean, College of Engineering. During the fall term, all first-year engineering students take calculus, physics, a foundation seminar (FOUN or RESC), W1 writing course, an introductory engineering course, ENGR 100 Engineering Design Experience (unless they have earned AP or other credit, or have a special educational need), and an engineering seminar course, ENGR 099 Engineering Seminar: Becoming a Bucknell Engineer. In the spring term, they take the first course in their engineering major. The sophomore year continues the emphasis on science and mathematics and introduces courses in the engineering sciences, such as mechanics, thermodynamics, fluids and materials. During the junior and senior years, most of the work is concerned with the principles of the student's major engineering discipline.

Each program contains courses in mathematics and natural sciences, a general education component, courses in engineering sciences, and courses in design, systems and synthesis. The remaining courses, depending upon the specific program, may be in the student's engineering discipline or in electives.

Engineering as a profession strives to benefit society through the application of technology and science. Meaningful contributions from engineering graduates are achieved by balancing technical proficiency with a wider understanding of society. The general education component provides engineering graduates with contextual sensitivity that will enable them to make impactful contributions throughout their careers given complex and global drivers of societal change. Exploring disciplinary perspectives, views, methodologies and ways of knowing beyond the major are not only important aspects of a liberal arts experience, and a hallmark of a Bucknell education as stated in the University learning goals, but also a critical component of being an impactful engineer.

Students should develop a plan in concert with their academic advisers and then carry out that plan to use the courses that fulfill the general education requirement, free electives, and in-major electives to achieve these wider goals. Possible paths include exploring topics directly related to their engineering major, exploring a diverse set of courses, pursuing courses within a specific nontechnical area or pursuing a minor.

General Education Requirement

To fulfill the **general education requirement**, engineering students must complete five courses. One of the five courses must be a social science or management course and one must be an arts & humanities course. Of these two courses, one may be further specified by the student's degree program. The remaining three courses may be fulfilled by any combination of social science, management, arts & humanities, university courses, residential college courses or foundation seminars.

In the course of fulfilling a student's degree program, two additional requirements must also be met. All engineering students must fulfill the University writing requirement and must complete the college global perspectives requirement. The college global perspectives requirement is met through a Global Connections course or a foreign language course. The writing and the global perspectives requirements may be fulfilled by any course so designated in the student's degree program.

In addition, the engineering curricula reflect the increased importance of design in the education of today's students by an integration of design instruction from ENGR 100 Engineering Design Experience through all four years to the senior design courses. The emphasis of all programs is on the development of a broad foundation in engineering and on the initiation of specialized study in a specific engineering discipline.

Whenever appropriate, students may engage in special projects in creative design or in independent study, or they may participate with a faculty member in a research project. Such projects may start in or continue into the summer.

Several engineering departments offer a program of departmental honors in which selected majors may undertake special studies or investigations leading to graduation with honors.

Students are encouraged to work with their faculty advisers and department chairs to take full advantage of the flexibility of the engineering programs that makes possible special plans of study appropriate to their individual career objectives. Furthermore, with the approval of the department chair and the dean of the College of Engineering, degree requirements may be altered slightly to accommodate special needs of students with different academic backgrounds and those who have transferred from other degree programs or other institutions.

All engineering degree programs require the completion of 34 courses (42 in the combined liberal arts-engineering program and the engineering-management program) with a cumulative grade point average (GPA) of at least 2.00 overall and in engineering.

Writing Requirement

To satisfy the **University writing requirement**, a student must successfully complete three writing courses: one course designated W1 (which must be taken during the first semester, unless approved by the associate dean of engineering, and before the W2 courses), and two W2 courses (usually taken after the first year, but, in any case, at least one of which must be taken after the first year). Lists of W1 and W2 courses are available on the Registrar's webpage (bucknell.edu/Registrar (http://www.bucknell.edu/Registrar/)) under Course Information.

Writing courses are designed to enhance the student's understanding of the writing process and to emphasize that writing is a way of learning as well as a communication skill. They may be taken in any department.

Minors

Students in the College of Engineering, through judicious choice of electives, may choose a departmental or interdepartmental minor.

Those students who wish to apply the principles, concepts and methods from their prospective majors to define, understand and solve problems in the life sciences and medical technology have several options.

1. Students may major in one of the eight bachelor of science programs in engineering and use their elective courses to concentrate on biology, chemistry and biomedical engineering. (Biology students may elect to use their unrestricted electives to take engineering courses.)
2. Through a judicious choice of electives, engineering students may complete the **biomedical engineering minor** that combines the study of the basic biological sciences with their technological application.

Faculty advisers in these disciplines will advise students on the appropriateness of the various options in light of their particular career goals. Information on specific faculty advisers may be obtained from the Office of the Dean of Engineering. Students wishing to complete the pre-medical requirement should consult the pre-health professions adviser.

Students can declare a minor (via an online declaration form (https://etcentral.bucknell.edu/#/form/22/?header=false&focus=true)) beginning in their 4th semester and up to March 1 for May degree candidates and Dec. 1 for January degree candidates, assuming they have declared and been approved for a major and earned at least 12 cumulative credits.

Program in Engineering & Liberal Arts

The five-year program in engineering & liberal arts offers students the opportunity to obtain a broader education in the arts or sciences while completing the requirements for a major in engineering. Students may combine any bachelor of science degree program in engineering with any bachelor of arts degree. Students' home college will be the College of Engineering. Upon successful completion of this program, the single degree, bachelor of science in the engineering major, and bachelor of arts degree is awarded.

Students may enter this joint program at any time during the first five semesters of one of the engineering B.S. programs. Students in the College of Arts & Sciences also may apply to enter this program. The timing for this change is critical because of the sequential nature of the courses in the

engineering programs. Such students should consult the associate dean of the College of Engineering as early as possible and no later than their third semester of study.

Students in this program must fulfill the distribution requirements and the major requirements for the degrees of bachelor of arts and either the bachelor of science in biomedical, chemical, civil, computer, electrical, environmental or mechanical engineering, or bachelor of science in computer science & engineering. Suggested course sequences for each five-year program are available from the Office of the Dean of Engineering.

Program in Engineering & Management

The five-year program in engineering & management offers students the opportunity to combine the study of engineering in any of the engineering degree programs with a selected sequence of courses in management. Students' home college will be the College of Engineering. Upon successful completion of this program, the joint degree, the Bachelor of Science in Engineering degree (within a specific engineering discipline), and the Bachelor of Management for Engineers degree is awarded. The degree has the same accreditation status as the four-year bachelor of science degree in the engineering program selected. See Bachelor of Management for Engineers (p. 424) for specific course requirements.

Prospective students interested in pursuing this five-year degree program are encouraged to apply for admission directly into the program. Admission to this joint degree program may be limited by enrollment.

Suggested course sequences for the program and detailed information on the degree requirements are available from the Office of the Dean of Engineering and the Freeman College of Management.

Graduate Studies

Bucknell University's graduate program leads to the degrees of master of science in chemical, civil, electrical, environmental or mechanical engineering. Each graduate program is individually tailored to meet the needs, preparation and goals of the student.

Undergraduate students who have completed three years in the chemical, civil, electrical, environmental or mechanical engineering program at Bucknell, earned a cumulative grade point average of at least 3.0, and who show an aptitude for graduate study, may apply for admission to the integrated 3-2 program through the Office of Graduate Studies. This program permits selected students to complete all requirements for both a bachelor of science degree and a master of science degree in five years. Those students who are selected receive a full-tuition scholarship for the fifth year.

Traditional master's degree programs are offered in addition to the special 3-2 program. Assistantships are available. Information can be obtained from the dean of engineering or the dean of graduate studies.

In addition to formal master's degree programs, any undergraduate student who has arranged to complete all undergraduate degree requirements may with prior approval take up to two courses for graduate credit. An application for graduate credit by undergraduate students may be obtained from the Office of Graduate Studies or the Office of the Registrar.

Areas of Study (EG)

Biomedical Engineering

Faculty

Professors: James W. Baish, Donna M. Ebenstein (Chair), Eric A. Kennedy, Joseph V. Tranquillo (Associate Provost for Transformative Teaching & Learning)

Associate Professor: Daniel P. Cavanagh

Assistant Professors: Olivia Boerman, Theo Hopper (Teaching), Karlo Malaga

Adjunct: Jove Graham

Mission Statement

The mission of the biomedical engineering department is to foster an inclusive learning community that prepares our students to have the necessary technical and professional skills and empathy to equitably improve human health and well-being in a diverse and rapidly changing world.

To do this, the department offers the following:

- A Bachelor of Science in Biomedical Engineering degree for students seeking a comprehensive education in biomedical engineering.
- A minor in biomedical engineering for students in other engineering disciplines seeking a basic competency in the discipline and enhanced background in the life sciences.
- Elective courses to support the needs of students outside of the major and minor programs.

Program Educational Objectives

The following program educational objectives of the Department of Biomedical Engineering at Bucknell University are broad statements that describe what graduates are expected to attain within a few years of graduation. As graduates will pursue diverse career paths, these objectives are intended to apply to those who pursue technical and professional careers.

- Alumni will experience success in a variety of biomedical engineering-related postgraduate environments or other diverse areas that require technical and/or professional skills.
- Alumni will contribute to their fields or professions.
- Alumni will pursue professional development, including continuing or advanced education, relevant to their career path.

Student Outcomes

Graduates of the program shall demonstrate the following at the time of graduation:

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed using appropriate learning strategies.

The biomedical engineering program at Bucknell University is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (https://www.abet.org/).

Bachelor of Science in Biomedical Engineering

The **Bachelor of Science** in Biomedical Engineering requirements are:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ENGR 099	0	BMEG 210	1
ENGR 100	1	BMEG 226	.5
MATH 201	1	MATH 202	1
PHYS 211	1	PHYS 212	1
Foundation Seminar (W1)	1	Elective	1
	4		**4.5**
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
BMEG 250	1	BMEG 205	1

BMEG 409	.5	BMEG 220	.5
MATH 211	1	CHEM 211	1
CHEM 205	1	ENGR 240	1
Elective	1	MATH 212	1
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
BMEG 350	1	BMEG 300	1
BIOL 203	1	BMEG 408	.5
Two Electives	2	BIOL 221	1
		CHEM 230	1
		Elective	1
	4		**4.5**

Senior

First Semester	Credits	Second Semester	Credits
BMEG 400	1	BMEG 402	1
BMEG 401	1	Three electives	3
Two Electives	2		
	4		**4**

Five Year

First Semester	Credits	Second Semester	Credits
Four electives	4	Four electives	4
	4		**4**

Total Credits: 42

The 11 elective courses are distributed as follows:

- Five courses that meet engineering (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) college requirements for general education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) selected from any of the following: social science courses, arts & humanities courses, university courses, residential college courses or foundation seminars. These five courses must include one course in arts & humanities and one course in social sciences.
- Two approved 200+ level engineering, math or science courses from the list published by the department.
- One approved 300+ level engineering course from the list published by the department.
- One BMEG engineering elective course from the list published by the department.
- Two courses in any department or program of the University provided that the prerequisites are satisfied.

Any of these electives may also count toward other university majors and minors.

Required natural science and math courses (e.g., PHYS, CHEM, BIOL or MATH) and ENGR 240 may also count toward other university majors and minors.

Of all courses in the student's degree program (required and elective courses):

- Three courses in each student's program must fulfill the University writing requirement that includes a W1 course (FOUN or RESC) taken in the first semester and two subsequent W2 courses.
- One course must fulfill the engineering college global perspectives requirement (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/), which can be satisfied by a Global Connections course or a foreign language course.

Bachelor of Arts/Management for Engineers - Bachelor of Science in Biomedical Engineering

The **Bachelor of Arts/Management for Engineers - Bachelor of Science** in Biomedical Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099	0	BMEG 210	1
ENGR 100	1	BMEG 226	.5
MATH 201	1	MATH 202	1
PHYS 211	1	PHYS 212	1
Foundation Seminar (W1)	1	Elective	1
	4		**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
BMEG 250	1	BMEG 205	1
BMEG 409	.5	BMEG 220	.5
MATH 211	1	CHEM 211	1
CHEM 205	1	ENGR 240	1
Elective	1	MATH 212	1
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
BMEG 350	1	BMEG 300	1
BIOL 203	1	BMEG 408	.5
Two Electives	2	BIOL 221	1
		CHEM 230	1
		Elective	1
	4		**4.5**

Senior

First Semester	Credits	Second Semester	Credits
BMEG 400	1	BMEG 402	1
BMEG 401	1	Three electives	3
Two Electives	2		
	4		**4**

Total Credits: 34

The 19 elective courses are distributed as follows:

- Eight courses selected to satisfy the major requirements for the Bachelor of Arts/Management for Engineers major.
- Five courses that meet engineering (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/)college requirements for general education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) selected from any of the following: social science courses, arts & humanities courses, university courses, residential college courses or foundation seminars. These five courses must include one course in arts & humanities and one course in social sciences.
- Two approved 200+ level engineering, math or science courses from the list published by the department.
- One approved 300+ level engineering course from the list published by the department.
- One BMEG engineering elective course from the list published by the department.
- Two courses in any department or program of the University provided that the prerequisites are satisfied.
- Courses used to fulfill the General Education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) requirements for engineering students should also fulfill the College of Arts & Sciences Core Curriculum (CASCC) (https://coursecatalog.bucknell.edu/collegeofartsandsciencescurricula/curriculaoverview/collegecorecurriculum/) requirements for those in the 5-year engineering & liberal arts dual degree program or the Freeman College of Management General Education Curriculum (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/curriculaoverview/gened/) requirements for those in the 5-year engineering & management dual degree program

Any of these electives may also count toward other university majors and minors.

Required natural science and math courses (e.g., PHYS, CHEM, BIOL or MATH) and ENGR 240 may also count toward other university majors and minors.

Of all courses in the student's degree program (required and elective courses):

- Three courses in each student's program must fulfill the University writing requirement that includes a W1 course (FOUN or RESC) taken in the first semester and two subsequent W2 courses.
- One course must fulfill the engineering college global perspectives requirement (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/), which can be satisfied by a Global Connections course or a foreign language course.

Minor in Biomedical Engineering

Engineering students not pursuing the Bachelor of Science in Biomedical Engineering may choose to pursue a **minor** in biomedical engineering. This minor is attained through a judicious use of electives that combine the study of the basic biological sciences with an area of technological interest. To complete the biomedical engineering minor, engineering students must successfully complete at least **five credits** from approved courses as follows. Additional courses may be approved by the biomedical engineering department on a case-by-case basis.

At least two credits from the following list, with at least one having a [1] designation:

BMEG 425	Patients, Diseases, & Devices [1]	1
BMEG 431	Biomimetic Materials [1]	1
BMEG 437	Tissue Engineering [1]	1
BMEG 441/ECEG 411	Neural Engineering [1]	1
BMEG 451	Biomechanics and Injury Prevention [1]	1
BMEG 463	Medical Imaging [1]	1
BMEG 471/472	Advanced Topics in Biomedical Engineering [1]	1
BMEG 480/481	Biomedical Engineering Project	.5
BMEG 490/491	Biomedical Engineering Research	1
CHEG 452	Bioprocess Engineering	1
CHEG 460	Biomaterials: Materials in Medicine	1
MECH 476	Biomechanics	1
Select remaining credits from the above list or the following:		
BIOL 203	Integrated Concepts in Biology Fall	1
BIOL 204	Integrated Concepts in Biology Spring	1
BIOL 221	Human Physiology	1
BIOL 312	Comparative Vertebrate Anatomy	1
BIOL 318	Principles of Physiology	1
BIOL 324	Neurophysiology	1
BIOL 327	Molecular Biology	1
BIOL 328	Endocrinology	1
BIOL 340/CHEM 358	Biochemical Methods	1
BIOL 348	Immunology	1
BIOL 352	Cell Biology	1
BIOL 365	Introduction to Microscopy	1
CHEM 340	Biological Physical Chemistry	1
CHEM 351	Biochemistry I	1
CHEM 352	Biochemistry II	1
CHEM 358/BIOL 340	Biochemical Methods	1

Graduates of the program shall demonstrate the following student outcomes at the time of graduation:

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Courses

BMEG 205. Bioinstrumentation I. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduction to analog and digital circuits with applications to medicine and biology. Corequisite: MATH 212. Prerequisite: MATH 202. Open to biomedical engineering majors only.

BMEG 210. Fundamentals of Biomedical Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Introduction to the application of fluid mechanics, mass transfer, instrumentation, mechanics, and societal issues to biomedical problems. Hands-on laboratory experiences integrated with lecture. Prerequisites: MATH 201 and PHYS 211P. Open to biomedical engineering majors only.

BMEG 220. Introduction to Engineering Computing. .5 Credits.
Offered Spring Semester Only; Lecture hours:2,Other:1
Introduction to numerical methods and programming fundamentals. Problems drawn from mathematics, engineering, and biomedical engineering. Corequisite: MATH 212. Not open to students who have taken ENGR 211, ENGR 212, ENGR 214. Open to biomedical engineering majors only.

BMEG 226. Statistical Methods in Biomedical Engineering. .5 Credits.
Offered Spring Semester Only; Lecture hours:2,Lab:1
Introduction to concepts in experimental design and data analysis with application to biomedical engineering, medicine, and biology. Prerequisite: MATH 201. Not open to students who have taken ENGR 215, MATH 216 or MATH 226. Open to biomedical engineering majors only.

BMEG 250. Fundamentals of Biomechanics. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Application of mechanical analyses to solve biomechanical problems including: equilibrium of rigid bodies, anthropometric analysis, link segment analysis, internal loads, combined loading, failure theory. Prerequisites: PHYS 211 and MATH 201. Not open to students who have taken ENGR 220, ENGR 221 or MECH 220. Open to biomedical engineering majors only.

BMEG 300. Biotransport I. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
First biotransport course. Fluid mechanics principles applied to biological systems and medical devices. Properties of biological fluids, energy and momentum balances, computational modeling. Prerequisite: MATH 212. Not open to students who have taken CHEG 300, ENGR 222, or ENGR 233. Open to biomedical engineering majors only.

BMEG 350. Fundamental of Biomedical Signals and Systems. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Time and frequency analysis, filter design and feedback control as applied to biomedical signals and systems. Prerequisites: BMEG 205 and MATH 212. Open to biomedical engineering majors only.

BMEG 400. Biotransport II. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Second biotransport course focusing on the advanced application of fundamental heat and mass transport concepts to biological systems and medical devices. Conduction, convection, thermal properties of materials, mass diffusion, compartmental modeling. Prerequisite: BMEG 300. Open to biomedical engineering majors only.

BMEG 401. Biomedical Engineering Capstone I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Senior design course emphasizing the biomedical engineering design process including problem identification and medical motivation, background research, medical regulations and ethics, design and project proposal presentation. Prerequisite: BMEG 408. Open to biomedical engineering majors only.

BMEG 402. Biomedical Engineering Capstone II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Second semester of the biomedical engineering design sequence emphasizing fabrication, instrumentation, testing and evaluation, and final presentation of projects. Prerequisites: BMEG 401. Open to biomedical engineering majors only.

BMEG 408. Medical Device Assessment and Development. .5 Credits.
Offered Spring Semester Only; Lecture hours:2,Other:3
An examination of medical device design including benchmarking, intellectual property, regulatory pathways, industry standards, project planning, project management, and individual and team professionalism. Topics will be applied to currently marketed medical devices. Prerequisites: BMEG 205. Open to biomedical engineering majors only.

BMEG 409. Fabrication and Experimental Design. .5 Credits.
Offered Fall Semester Only; Lecture hours:2,Other:1
A hands-on course focusing on skills relevant to biomedical engineers, such as computer-aided design and documentation, fabrication, materials, selection and biocompatibility. Cell culture and experimental design. Class will be a mixture of lectures and hands-on activities. Prerequisite: BMEG 226 or MATH 216. Open to biomedical engineering majors only.

BMEG 425. Patients, Diseases, & Devices. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Student-driven exploration of the comprehensive patient experience including disease cause and progression, clinical diagnosis and treatments, post-intervention care, and patient personal experiences and decisions. Prerequisite: permission of the instructor.

BMEG 431. Biomimetic Materials. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Introduction to topics in biomimetics, studying nature as an inspiration for engineering design. Topics include relationships between microstructure and physical properties of natural materials and tissue engineering approaches to biomaterials design. Prerequisite: permission of the instructor. Crosslisted as BMEG 631, MECH 478 and MECH 678.

BMEG 437. Tissue Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Course includes foundations of tissue engineering with a survey of current tissue engineering techniques used clinically, commercially and in research. The moral, social and ethical considerations of tissue engineering will be explored. Prerequisite: permission of the instructor.

BMEG 441. Neural Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Introduction to neural systems and engineering. Topics include neurophysiology, quantitative neural recording and stimulation models, neural signal acquisition and processing, clinical applications, and current field-wide challenges. Prerequisite: permission of the instructor. Crosslisted as ECEG 411 and ECEG 611.

BMEG 451. Biomechanics and Injury Prevention. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Survey course for field of biomechanics and research for injury prevention (lowering risk and/or severity). Mixture of lectures, labs, and projects. Prerequisite: permission of the instructor.

BMEG 457. Accident Analysis. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Analysis of vehicle design and performance as it pertains to crashworthiness. Vehicle materials and structure, how vehicles are regulated with an emphasis on occupant safety. Studying the evolution of modern designs to minimize injuries includes reviewing many relevant biomechanics research studies. Crosslisted as MECH 457 and MECH 657.

BMEG 463. Medical Imaging. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Recitation:1
Survey of medical imaging from the perspectives of the underlying physics and technology used to obtain images, software used to manage and manipulate images, and use of images in clinical and scientific practice. The economic, societal, cultural and ethical aspects of imaging will be addressed. Prerequisite: permission of the instructor.

BMEG 471. Advanced Topics in Biomedical Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1; Repeatable
Advanced, in-depth course developed from areas of biomedical engineering. Topics will vary. Prerequisite: permission of the instructor. Crosslisted as BMEG 671.

BMEG 472. Advanced Topics in Biomedical Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Recitation:1; Repeatable
Advanced, in-depth course developed from areas of biomedical engineering. Topics will vary. Prerequisite: permission of the instructor. Crosslisted as BMEG 672.

BMEG 480. Biomedical Engineering Project. .5 Credits.
Offered Fall Semester Only; Lecture hours:1,Other:5; Repeatable
Individual work with a faculty adviser on development, design, or research project beginning with a written plan and culminating with a written or oral presentation. Prerequisite: permission of the instructor.

BMEG 481. Biomedical Engineering Project. .5 Credits.
Offered Spring Semester Only; Lecture hours:1,Other:5; Repeatable
Individual work with a faculty adviser on development, design, or research project beginning with a written plan and culminating with a written or oral presentation. Prerequisite: permission of the instructor.

BMEG 490. Biomedical Engineering Research. 1 Credit.
Offered Fall Semester Only; Lecture hours:1,Other:10; Repeatable
Independent study with a faculty adviser on a research or design project. Submit a proposal for group review, conduct the work, and culminate with a written report and an oral presentation before a faculty group. Prerequisite: permission of the instructor.

BMEG 491. Biomedical Engineering Research. 1 Credit.
Offered Spring Semester Only; Lecture hours:1,Other:10; Repeatable
Independent study with a faculty adviser on a research or design project. Submit a project proposal for group review, conduct the work, and culminate with a written report and an oral presentation before a faculty group. Prerequisite: permission of the instructor.

Chemical Engineering

Faculty

Professors: Jeffrey Csernica, Michael J. Prince, Timothy M. Raymond (Chair), Margot Vigeant, Katsuyuki Wakabayashi, Wendelin J. Wright

Associate Professors: Daniel P. Cavanagh, Dabrina Dutcher, Erin L. Jablonski (Director for the Perricelli-Gegnas Center for Entrepreneurship & Innovation), Kenny Mineart, Elif Eda Miskioglu, Ryan Snyder, Brandon M. Vogel

Assistant Professors: Jude Okolie, Hannah Comstock Yocum

Mission Statement

The chemical engineering department is dedicated to providing educational opportunities in chemical engineering to a highly select, predominantly undergraduate student body of talented individuals. The department encourages close interactions between students and the faculty, who are dedicated to education and are actively engaged in scholarship that enriches the educational program. The program emphasizes active learning with a strong laboratory component. The department nurtures the intellectual, professional and personal development of its students and faculty to prepare and encourage them to be highly competent professionals and responsible members of society.

Program Educational Objectives

Following the definition presented by ABET, the department's educational objective statement broadly reflects the career accomplishments and expectations of alumni who graduate from the program:

Alumni will experience success in a variety of postgraduate environments, including but not limited to chemical engineering professional practice and advanced study.

Student Outcomes

Graduates of the program shall demonstrate the following at the time of graduation:

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed using appropriate learning strategies.

The chemical engineering program at Bucknell University is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (https://www.abet.org/).

Bachelor of Science in Chemical Engineering

The Bachelor of Science in Chemical Engineering requirements are:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ENGR 099	0	CHEM 205	1
ENGR 100	1	CHEG 200	1
MATH 201	1	MATH 202	1
PHYS 211	1	ENGR 211	.5
Foundation Seminar (W1)	1	CHEG 101	0

		Elective	1
		4	**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
CHEM 233	1	CHEM 211	1
ENGR 240	1	CHEG 210	1
MATH 211	1	ENGR 215	.5
CHEG 302	.5	ENGR 233	1
Elective	1	CHEG 102	0
		Elective	1
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
CHEM 343	1	CHEG 310	1
CHEG 300	1	CHEG 315 May be taken in First Semester of Junior Year instead	.5
Two electives	2	CHEG 103	0
		Three electives	3
	4		**4.5**

Senior

First Semester	Credits	Second Semester	Credits
CHEG 320	1	CHEG 330 May be taken in Second Semester of Junior Year instead	1
CHEG 400	1	CHEG 410	1
Two electives	2	CHEG 104	0
		Two electives	2
	4		**4**

Total Credits: 34

The following sequence of courses emphasizes design across the curriculum and develops the professional skills of communication, problem-solving, teamwork and independent learning:

CHEG 200	Chemical Engineering Principles	1
ENGR 233	Chemical Engineering Fluid Mechanics	1
CHEG 300	Heat and Mass Transfer	1
CHEG 315	Unit Operations Laboratory	.5
CHEG 400	Process Engineering	1
CHEG 410	Project Engineering	1

The 13 elective courses shown above are distributed as follows:

- Five courses selected from any of the following: social science courses, arts & humanities courses, university courses, residential college courses or foundation seminars. These five courses must include:
  - *One course in arts & humanities*
  - *One course in social sciences*
- Three courses selected from the list of approved technical electives published by the department that can be found on the department webpage: bucknell.edu/ChemicalEngineering (http://www.bucknell.edu/ChemicalEngineering/).
- Two additional courses in chemical engineering.
- Three unrestricted electives in any department or program of the University.

Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC), and two subsequent W2 courses. One course in each student's program must also fulfill the college's global perspectives requirement. Any of the 13 electives may also count toward other University majors and minors.

Through judicious choice and curricular planning, students may be able to select a concentration – a series of electives that will allow development of expertise in a particular sub-discipline of chemical engineering. The following concentrations are available: biological, computing, environmental, materials and process. Declaration of a concentration is optional. Updated listings of courses that may be used toward a concentration and

other associated requirements are maintained on the department webpage: bucknell.edu/ChemicalEngineering (http://www.bucknell.edu/ChemicalEngineering/).

Bachelor of Arts/Management for Engineers - Bachelor of Science in Chemical Engineering

The requirements for the degree Bachelor of Arts/Management for Engineers - Bachelor of Science in Chemical Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099	0	CHEM 205	1
ENGR 100	1	CHEG 200	1
MATH 201	1	MATH 202	1
PHYS 211	1	ENGR 211	.5
Foundation Seminar (W1)	1	CHEG 101	0
		Elective	1
	4		**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
CHEM 233	1	CHEM 211	1
ENGR 240	1	CHEG 210	1
MATH 211	1	ENGR 215	.5
CHEG 302	.5	ENGR 233	1
Elective	1	CHEG 102	0
		Elective	1
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
CHEM 343	1	CHEG 310	1
CHEG 300	1	CHEG 315[May be taken in First Semester of Junior Year instead]	.5
Two electives	2	CHEG 103	0
		Three electives	3
	4		**4.5**

Senior

First Semester	Credits	Second Semester	Credits
CHEG 320	1	CHEG 330[May be taken in Second Semester of Junior Year instead]	1
CHEG 400	1	CHEG 410	1
Two electives	2	CHEG 104	0
		Two electives	2
	4		**4**

Five Year

First Semester	Credits	Second Semester	Credits
Four electives	4	Four electives	4
	4		**4**

Total Credits: 42

The following sequence of courses emphasizes design across the curriculum and develops the professional skills of communication, problem-solving, teamwork and independent learning:

CHEG 200	Chemical Engineering Principles	1
ENGR 233	Chemical Engineering Fluid Mechanics	1
CHEG 300	Heat and Mass Transfer	1
CHEG 315	Unit Operations Laboratory	.5

CHEG 400	Process Engineering	1
CHEG 410	Project Engineering	1

The 21 elective courses shown above are distributed as follows:

- Eight courses selected to satisfy the major requirements for the Bachelor of Arts/Management for Engineers major. Courses used to fulfill the General Education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) requirements for engineering students should also fulfill the College of Arts & Sciences Core Curriculum (CASCC) (https://coursecatalog.bucknell.edu/collegeofartsandsciencescurricula/curriculaoverview/collegecorecurriculum/) requirements for those in the 5-year Engineering & Liberal Arts dual degree program or the Freeman College of Management General Education Curriculum (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/curriculaoverview/gened/) requirements for those in the 5-year Engineering & Management dual degree program.
- Five courses selected from any of the following: social science courses, arts & humanities courses, university courses, residential college courses or foundation seminars. These five courses must include:
  - *One course in arts & humanities*
  - *One course in social sciences*
- Three courses selected from the list of approved technical electives published by the department that can be found on the department webpage: bucknell.edu/ChemicalEngineering (http://www.bucknell.edu/ChemicalEngineering/).
- Two additional courses in chemical engineering.
- Three unrestricted electives in any department or program of the University.

Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC), and two subsequent W2 courses. One course in each student's program must also fulfill the college's global perspectives requirement. Any of the 13 electives may also count toward other University majors and minors.

Through judicious choice and curricular planning, students may be able to select a concentration – a series of electives that will allow development of expertise in a particular sub-discipline of chemical engineering. The following concentrations are available: biological, computing, environmental, materials and process. Declaration of a concentration is optional. Updated listings of courses that may be used toward a concentration and other associated requirements are maintained on the department webpage: bucknell.edu/ChemicalEngineering (http://www.bucknell.edu/ChemicalEngineering/).

Any of these electives may also count toward other university majors and minors.

Graduates of the program shall demonstrate the following student outcomes at the time of graduation:

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Courses

CHEG 101. Chemical Engineering Seminar. 0 Credits.
Offered Spring Semester Only; Lecture hours:1
A joint seminar for all chemical engineering students and faculty. Variety of engineering-related topics presented by industrial, academic, alumni, and student speakers. Presentations and discussions on professional development and interpersonal skills in the work place, ethics, and societal issues, professional society activities, and other topics relevant to the profession.

CHEG 102. Chemical Engineering Seminar. 0 Credits.
Offered Spring Semester Only; Lecture hours:1
A joint seminar for all chemical engineering students and faculty. Variety of engineering-related topics presented by industrial, academic, alumni, and student speakers. Presentations and discussions on professional development and interpersonal skills in the work place, ethics, and societal issues, professional society activities, and other topics relevant to the profession.

CHEG 103. Chemical Engineering Seminar. 0 Credits.
Offered Spring Semester Only; Lecture hours:1
A joint seminar for all chemical engineering students and faculty. Variety of engineering-related topics presented by industrial, academic, alumni, and student speakers. Presentations and discussions on professional development and interpersonal skills in the work place, ethics, and societal issues, professional society activities, and other topics relevant to the profession.

CHEG 104. Chemical Engineering Seminar. 0 Credits.
Offered Spring Semester Only; Lecture hours:1
A joint seminar for all chemical engineering students and faculty. Variety of engineering-related topics presented by industrial, academic, alumni, and student speakers. Presentations and discussions on professional development and interpersonal skills in the work place, ethics, and societal issues, professional society activities, and other topics relevant to the profession.

CHEG 1NT. Chemical Engineering Non-traditional Study. .25-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study course in chemical engineering. Prerequisite: permission of the instructor.

CHEG 200. Chemical Engineering Principles. 1 Credit.
Offered Spring Semester Only; Lecture hours:4,Lab:2
Introduction to the concepts of material and energy balances and phase equilibria for chemical engineering processes. Introduction to problem solving methodologies and computer simulation. With experimental laboratory. Prerequisite: MATH 201.

CHEG 210. Applied Mathematics for Chemical Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:1
Mathematical modeling and methods. Topics include ordinary and partial differential equations, Laplace transforms, and matrices with analytical and computer solutions. With computational laboratory. Prerequisite: MATH 211 or equivalent.

CHEG 230. Engineering Car Design. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:2; Repeatable
The Chem-E Car Competition challenges interdisciplinary teams to design, build, and compete with a shoe box sized vehicle that must travel a specified distance carrying a specific load in under two minutes and stop closest to the finish line. Interdisciplinary student teams design and build these cars. Crosslisted as UNIV 235.

CHEG 242. Introduction to Food Science and Engineering for non-majors. 1 Credit.
Offered Summer Session Only; Lecture hours:2,Other:2
Introduction to engineering and science principles in the context of food science and engineering, including chemistry, heat transfer, fluid flow, thermodynamics, and product and process design. Course includes laboratory and design projects with exploration of food processing, regulations, and interplay between technical and social concerns. Crosslisted as UNIV 242.

CHEG 2NT. Chemical Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study course in chemical engineering. Prerequisite: permission of the instructor.

CHEG 300. Heat and Mass Transfer. 1 Credit.
Offered Fall Semester Only; Lecture hours:4,Lab:2
Conductive, convective and radiation heat transfer; analytical and numerical solutions of heat transfer problems, estimation of heat transfer coefficients, and heat exchanger design. Fundamentals of mass transfer (diffusion and convection) with applications to unit operations. With experimental laboratory. Prerequisites: ENGR 233, CHEG 200 and CHEG 210 or MATH 212.

CHEG 302. Separation Processes. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2,Lab:1
Analysis of binary and multicomponent separations by analytical, graphical, and computer methods. Topics include gas absorption, distillation, liquid-liquid extraction as well as selected novel separation processes. With computational laboratory. Prerequisite: CHEG 200.

CHEG 310. Chemical Engineering Thermodynamics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:1
Laws of thermodynamics and application to chemical engineering processes, thermodynamic modeling of phase and chemical behavior, chemical reaction equilibrium. With computational laboratory. Prerequisites: CHEG 302 and CHEM 341 or CHEM 343.

CHEG 315. Unit Operations Laboratory. .5 Credits.
Offered Either Fall or Spring; Lecture hours:1,Lab:3
A laboratory course in pilot-scale processes involving momentum, heat and mass transfer. Project definition, experimental operation, analytical procedures, data analysis, technical reports and oral presentations. Prerequisite: CHEG 300 302. Corequisite: CHEG 310.

CHEG 320. Chemical Reaction Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Rate forms for homogeneous, catalytic, and biological reactions; isothermal and nonisothermal reactor design and analysis; interpretation of laboratory data; introduction to nonideal flow and residence-time distributions. With experimental laboratory. Prerequisites: CHEM 341 or CHEM 343 and CHEG 210 or MATH 212 and CHEG 310.

CHEG 330. Process Modeling, Dynamics, and Control. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Modeling the dynamics of chemical processes with and without control. Design, analysis and tuning of control systems using analytical and computational tools. Instrumentation and computer-based data acquisition and control for chemical systems. Introduction to process safety considerations. With experimental laboratory. Prerequisites: CHEG 210 or MATH 212 and CHEG 300.

CHEG 3NT. Chemical Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study course in chemical engineering. Prerequisite: permission of the instructor.

CHEG 400. Process Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:2
Applications of engineering, economic, environmental, and ethical principles in preliminary process design using computer aids such as process simulators. Problem definition literature survey, flowsheet development, material and energy balances, equipment design, profitability analysis, oral and written communication. With design laboratory. Prerequisites: CHEG 300, CHEG 310, and CHEG 315.

CHEG 410. Project Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:1
Second of two capstone experiences. Students refine a general problem statement in order to plan, execute and assess a project that achieves specific goals. Design, construction, and testing of an apparatus, system, or simulation. Problem-solving, teamwork, communication, professional development, and laboratory work are emphasized. With design laboratory. Prerequisite: CHEG 400. Crosslisted as CHEG 610.

CHEG 430. Chemical Engineering Project. .25-.5 Credits.
Offered Either Fall or Spring; Lecture hours:1,Other:5; Repeatable
Variable credit (0.25-0.50) individual work with a faculty adviser on a development or design project beginning with a written plan and culminating with a deliverable product and a written report. Problem analysis involving information synthesis, experimentation, mathematical modeling or software development. Prerequisite: permission of the instructor. Crosslisted as CHEG 630.

CHEG 440. Chemical Engineering Research. 1 Credit.
Offered Both Fall and Spring; Lecture hours:1,Other:11; Repeatable
Independent study with a faculty adviser on a research project. Submit a project proposal for group review, conduct the work, and culminate with a written report and an oral presentation before a faculty group. Prerequisite: permission of the instructor. Crosslisted as CHEG 640.

CHEG 442. Food Science & Technology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Fundamentals of food science, food engineering, and food systems at scales from experimental to industrial production. Exploration of food processing and preservation, reactions in food systems, surface chemistry, regulations, ethics, and food product and process development. Crosslisted as CHEG 642.

CHEG 444. Genetic Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Genetic engineering is a powerful technology with applications in many fields, including medicine and agriculture. This course considers both the basic science and societal impact of genetic engineering. Topics include basic principles, techniques/technologies of genetic engineering, societal implications, ethical considerations, and historical case studies. A biology background is not required. Crosslisted as CHEG 644.

CHEG 450. Polymer Science. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Structure, characterization and properties of polymeric materials. Chemistry and kinetics of polymerization. Processing and application of polymers. Corequisite: CHEM 341 or CHEM 343. Crosslisted as CHEG 650.

CHEG 452. Bioprocess Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Survey course in biochemical engineering. Introduction to microbiology, biochemistry, cell metabolism and genetic control. Enzyme structure and function; enzyme kinetic mechanisms. Emphasis on the design of biochemical reactors and separation processes utilizing fundamental principles of kinetics, thermodynamics and heat, mass and momentum transfer. Prerequisite: CHEG 302. Corequisite: CHEG 320. Crosslisted as CHEG 652.

CHEG 455. Atmospheric Chemistry and Physics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Addresses the relationships of chemistry, physics, and engineering principles in understanding processes in the Earth's atmosphere. Topics include overview of the Earth's atmospheric history and problems of current environmental concerns including urban ozone, acid rain, particulate pollution, and global change. Crosslisted as CHEM 365 and CHEG 655.

CHEG 458. Fermentation Processes. 1 Credit.
Offered Either Fall or Spring; Lecture hours:2,Other:2
Overview of chemicals production via fermentation and other industrially relevant processes. Analysis of key aspects of process chemistry, development and economics. Consideration and assessment of social and environmental impacts as well as sustainability in the context of process engineering. Prerequisite: permission of the instructor. Crosslisted as CHEG 658.

CHEG 460. Biomaterials: Materials in Medicine. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Classes of biomaterials, their applications, and current trends in biomaterials research and technology. Medical/ethical implications of biomaterials development and research. Prerequisite: ENGR 240, or ENGR 242, or equivalent. Others by permission of the instructor. Crosslisted as CHEG 660.

CHEG 465. Advanced Materials Science and Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Advanced, in-depth exploration of processing - structure - property - performance relationships of materials through real-world examples and case studies. Prerequisite: ENGR 240, ENGR 242, or equivalent. Crosslisted as CHEG 665.

CHEG 468. Particle Technology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Addresses engineering principles involved in the production, processing and measurement of particles sized from the nanoscale to the macroscale applied to pharmaceutical production, drug delivery, air pollution, nanotechnology, paints and coatings, industrial chemicals and agricultural products. Topics: particle motion, size distributions, analysis methods, storage, flow, mixing, segregation, safety and hazards. Crosslisted as CHEG 668.

CHEG 470. Special Topics in Chemical Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4; Repeatable
Advanced, in-depth courses developed from areas of chemical engineering science or technology. Prerequisite: junior or senior status. Crosslisted as CHEG 670.

CHEG 472. Special Topics in Chemical Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4; Repeatable
Advanced, in-depth courses developed from areas of chemical engineering science or technology. Prerequisite: junior or senior status. Crosslisted as CHEG 672.

CHEG 485. Topics in Transport Theory. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Mass, energy, and momentum transfer in continuous media. General equations of transfer developed and used to analyze physical systems. Development and application of mathematical techniques appropriate to the topic. Prerequisites: CHEG 300 or MATH 212 or equivalent, and any course on fluid mechanics, heat transfer, mass transfer or continuum physics. Crosslisted as CHEG 685.

CHEG 495. Advanced Topics in Engineering Mathematics. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Linear algebra and analytical/computational techniques for solving ordinary and partial differential equations relevant to engineering applications. Prerequisite: junior or senior status. Crosslisted as CEEG 495 and ECEG 495 and ECEG 695 and MECH 495 and ENGR 695.

CHEG 4NT. Chemical Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in chemical engineering. Prerequisite: permission of the instructor.

Civil Engineering

Faculty

Professors: Richard Crago (Chair), Douglas Gabauer, Matthew J. Higgins, Michael A. Malusis (Associate Dean for Faculty Development), Terri R. Norton (Associate Dean for Students & Strategic Initiatives), Brad Putman (Dean of the College of Engineering), Ronald D. Ziemian

Associate Professors: Michelle R. Beiler, Stephen G. Buonopane, Kevin Gilmore, Jessica Newlin, Kelly A. Salyards, Deborah L. Sills

Assistant Professors: Alomir H. Favero Neto, Carley Gwin (Associate Chair) (Teaching), Nicholas Tymvios

Postdoctoral Fellow: Austin Wadle

Vision

Bucknell University's civil and environmental engineering programs prepare the next generation of leaders in the stewardship of our natural and built environment for the benefit of the planet, communities and people.

Mission

Bucknell University's civil and environmental engineering programs provide an excellent undergraduate education in a four-year curriculum. We deliver a student-centered educational experience with outstanding teaching, small class sizes, hands-on and experiential learning, and close classroom and research interaction, with approachable faculty and staff. Our priorities include:

- creating an **inclusive and supportive community** in which all voices are valued and respected, diverse perspectives are embraced, and students, staff and faculty of all backgrounds and identities can thrive;
- providing the **breadth and depth of technical training** necessary for students to excel in professional positions and graduate programs;

- developing strong **critical thinking and communication skills**;
- instilling a mindset of **sustainability, equity, justice and ethical responsibility** to improve the lives of all people;
- integrating **perspectives from the arts, humanities, social sciences, management and engineering**, which are all uniquely provided at Bucknell, to address global and societal challenges; and
- inspiring **intellectual curiosity and the confidence to learn independently**.

Program Educational Objectives (PEOs)

The civil engineering program seeks to prepare students to be successful professionals who excel in their:

1. critical thinking, problem-solving and communication skills.
2. ability to work collaboratively and inclusively on diverse teams and within communities.
3. practicality, creativity and adaptability to new situations.
4. integration of equity, ethics, sustainability and the needs of underrepresented populations.
5. professional development and intellectual growth.

Student Outcomes

Graduates of the program are expected to demonstrate the following learning outcomes, which reflect ABET accreditation criteria.

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed using appropriate learning strategies.

The civil engineering program at Bucknell University is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (https://www.abet.org/).

Bachelor of Science in Civil Engineering

The Bachelor of Science in Civil Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099	0	ENGR 101	.5
ENGR 100	1	ENGR 229	1
MATH 201	1	Elective	1
PHYS 211	1	GEOL 250	1
Foundation Seminar (W1)	1	MATH 202	1
	4		**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
CHEM 203	1	ENGR 222	1
ENGR 239	1	CEEG 242	1
MATH 211	1	CEEG 300	1

ENGR 226	.5	CEEG 330	1
Elective	1	MATH 222	.5
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
CEEG 290	.5	ENGR 242	1
CEEG 320	1	CEEG 390	0
CEEG 340	1	Elective	1
CEEG 350	1	Science/Math Elective	1
ENGR 212	.5	CEEG UL Course	1
	4		**4**

Senior

First Semester	Credits	Second Semester	Credits
CEEG 492	1	CEEG 493	.5
CEEG UL Course	1	Two CEEG UL courses	2
Elective	1	Two Electives	2
Technical Elective	1		
	4		**4.5**

Total Credits: 34

The elective courses shown above are distributed as follows:

- A student must choose electives that meet engineering college requirements for general education and global perspectives (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/).
- One math or science elective selected from a list of approved courses (https://docs.google.com/document/d/1S8FWqxAaTQmudOrfGdZhHtvP_OtB1wXTPjh3UIGeT0g/edit/?usp=sharing).
- One technical elective selected from a list of approved courses (https://drive.google.com/file/d/1GM4ENKc09mBttP--pnyiIFzjhDFJ6Zpe/view/?usp=sharing).
- Two unrestricted electives. These can be used to pursue additional interests or further develop expertise in a specific area.
- The four required CEEG upper-level (UL) courses shown above must be 400-level CEEG courses.
- Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC), and two subsequent W2 courses.

Bachelor of Arts/Management for Engineers - Bachelor of Science in Civil Engineering

The Bachelor of Arts/Management for Engineers - Bachelor of Science in Civil Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099	0	ENGR 101	.5
ENGR 100	1	ENGR 229	1
PHYS 211	1	MATH 202	1
MATH 201	1	GEOL 250	1
Foundation Seminar (W1)	1	Elective	1
	4		**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
ENGR 239	1	ENGR 222	1
CHEM 203	1	CEEG 242	1
MATH 211	1	MATH 222	.5
ENGR 226	.5	CEEG 300 or 330	1
Elective	1	Elective	1
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
CEEG 290	.5	CEEG 390	0
CEEG 320 or 340	1	CEEG 300 or 330	1
CEEG 350	1	ENGR 242	1
ENGR 212	.5	Science/Math Elective	1
Elective	1	Elective	1
	4		**4**

Senior

First Semester	Credits	Second Semester	Credits
CEEG 320 or 340	1	CEEG UL Course	1
CEEG UL Course	1	Three Electives	3
Two Electives	2		
	4		**4**

Five Year

First Semester	Credits	Second Semester	Credits
CEEG 492	1	CEEG 493	.5
CEEG UL Course	1	CEEG UL Course	1
Technical Elective	1	Three Electives	3
Elective	1		
	4		**4.5**

Total Credits: 42

The elective courses shown above include:

- Courses used to fulfill the General Education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) requirements for engineering students should also fulfill the College of Arts & Sciences Core Curriculum (CASCC) (https://coursecatalog.bucknell.edu/collegeofartsandsciencescurricula/curriculaoverview/collegecorecurriculum/) requirements for those in the 5-year engineering & liberal arts dual degree program or the Freeman College of Management General Education Curriculum (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/curriculaoverview/gened/) requirements for those in the 5-year engineering & management dual degree program.
- One math or science elective selected from a list of approved courses (https://docs.google.com/document/d/1S8FWqxAaTQmudOrfGdZhHtvP_OtB1wXTPjh3UIGeT0g/edit/?usp=sharing).
- One technical elective selected from a list of approved courses (https://docs.google.com/document/d/1vNHB90q0AU0t6KxuGQwc6Of6i-nEj4LovYQOq2yx2uI/edit/?usp=sharing).
- The four required CEEG upper-level (UL) courses shown above must be 400-level CEEG courses.
- Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC), and two subsequent W2 courses.

Graduates of the program are expected to demonstrate the following learning outcomes, which reflect ABET accreditation criteria.

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed using appropriate learning strategies.

Courses

CEEG 242. Sustainability Principles for Engineers. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
An introduction to concepts for the application of sustainable engineering principles. Topics include sustainability concepts and definitions, life-cycle assessment, engineering and ecological economics, biogeochemical cycles, embedded resources, climate science, indicators of social sustainability, and systems thinking. Preference given to First and Second Year Civil Environmental Engineering Students.

CEEG 280. Special Topics in Civil and Environmental Engineering. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies
Individual projects in laboratory work, design, or library studies, depending upon the nature of the problem selected. Prerequisite: permission of the instructor.

CEEG 290. Engineering Economics & Project Management. .5 Credits.
Offered Fall Semester Only; Lecture hours:1,Lab:2
Fundamental topics underlining civil and environmental engineering design and management over the project life cycle, including engineering economy, sustainable design, project management and leadership, engineering ethics and the importance of professional licensure. Prerequisites: open to civil or environmental engineering majors. All others by permission of the instructor.

CEEG 2NT. Civil and Environmental Non-traditional Study. .25-4 Credits.
Offered Occasionally; Lecture hours:Varies
Non-traditional study in civil and environmental engineering.

CEEG 300. Introduction to Structural Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduction to behavior, analysis and design of structures; including design criteria, loads, modeling of structural systems, design with various material types (e.g. steel, concrete, timber, masonry). Discussion of the design process, and societal/global context of structural design. Case studies used throughout the course. Prerequisite: ENGR 239.

CEEG 320. Water Resources Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Planning, design, and operation of water resources projects with emphasis on hydrology, hydraulic structures, and open and closed conduits; applications in stormwater management and water supply. Prerequisite: ENGR 222.

CEEG 330. Introduction to Transportation. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Transportation systems, operations, planning, and design for highways and other modes; sustainability, safety, social, and economic issues; traffic studies in the local community.

CEEG 340. Environmental Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to fundamentals of environmental engineering and science including chemistry, microbiology, mass balance and reactor theory. Application of concepts to environmental engineering includes water quality, water and waste-water treatment, solid and hazardous waste, air pollution, greenhouse gases and climate change. Includes hands-on lab.

CEEG 350. Geotechnical Engineering I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Origin, composition, structure, and properties of soils. Identification, classification, strength, permeability, and compressibility characteristics. Introduction to foundation engineering. Laboratory determination of soil properties. Prerequisites: ENGR 222 and ENGR 229 or permission of the instructor.

CEEG 380. Special Topics in Civil and Environmental Engineering. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies
Individual projects in laboratory work, design, or library studies, depending upon the nature of the problem selected. Prerequisite: permission of the instructor.

CEEG 390. Civil & Environmental Engineering Seminar. 0 Credits.
Offered Spring Semester Only; Lecture hours:2; Repeatable
A weekly seminar for all civil and environmental engineering majors. Presentations by practicing engineers and others covering multiple sub-disciplines of civil and environmental engineering, professional practice, ethics, global issues, engineering careers and other relevant topics.

CEEG 3NT. Civil and Environmental Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in civil and environmental engineering. Prerequisite: permission of the instructor.

CEEG 401. Structural Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Analysis of structures including: review of essential mechanics; sketching deflection, moment, and force diagrams for indeterminate systems; influence lines; application of virtual force and displacement principles; and a comprehensive study of the direct stiffness method with a focus on matrix analysis. Prerequisites: CEEG 300 or permission of the instructor.

CEEG 403. Wood Engineering Design Principles. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Wood properties as construction material; design of beams, columns, fasteners, and connections. Glued-laminated timber and many other uses for structures in accordance with the National Design Specifications. Form work for concrete structures, plywood and plywood diaphragms. Prerequisite: CEEG 300 or permission of the instructor.

CEEG 405. Design of Steel Structures. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Introduction to behavior and design of steel structures and elements, including tension members, compression members, beams, beam-columns and connections. Limit states design philosophy is emphasized through the use of AISC specifications. Design loads according to contemporary standards, and international building codes.

CEEG 406. Design of Concrete Structures. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Introduction to behavior and design of concrete elements and structures: beams, columns, slabs, footings, bridges. Reinforced and prestressed concrete. Material properties and behavior, flexural and shear strength, serviceability and deflections. Use of relevant codes and specifications including ACI and AASHTO. Design loads according to contemporary standards and international building codes.

CEEG 407. Prestressed Concrete. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Analysis and design of prestressed concrete members and structures: flexural stresses, flexural strength, shear strength, loss of prestress, deflections. Prerequisites: CEEG 406 and permission of the instructor.

CEEG 408. Finite Element Methods. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:2
Fundamental theory and applications for civil and mechanical engineering. Multidimensional elements, and axisymmetric elements, and their formulations; stress recovery techniques; modeling considerations; convergence criteria and error estimates, includes use of commercial and developmental finite element analysis programs. Prerequisites: CEEG 300 or permission of the instructor. Crosslisted as CEEG 608 and MECH 467 and MECH 667.

CEEG 419. Advanced Topics in Structural Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Topics will vary. Prerequisite: permission of the instructor.

CEEG 421. Hydrology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
The interrelation of meteorological conditions, precipitation, surface runoff, and groundwater storage. Prerequisites: CEEG 320 and permission of the instructor.

CEEG 422. River Mechanics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Mechanics of free-surface flows in rivers; introduction to sediment transport mechanisms; application to river engineering design (bridge crossings, culverts, flood control, river stabilization). Prerequisites: ENGR 222 and permission of the instructor.

CEEG 425. Groundwater. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:2
The study of the occurrence of groundwater, the laws and equations governing storage and movement of groundwater, and the interaction between surface and ground waters. Prerequisite: permission of the instructor.

CEEG 429. Advanced Topics in Water Resources Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Topics will vary. Prerequisite: permission of the instructor.

CEEG 430. Introduction to Roadside Safety. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Fundamentals of roadside safety design and analysis: topics include traffic barrier warranting and selection, crash data analysis, hardware performance evaluation, and benefit/cost analysis. Prerequisite: CEEG 330 or permission of the instructor. Crosslisted as CEEG 630.

CEEG 431. Introduction to Urban and Regional Planning. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Problems of urban and regional planning and the treatment of various factors of a comprehensive plan. Emphasis on the sustainability and the interrelationships between engineering, sociology, geography, and economics. Prerequisite: permission of the instructor.

CEEG 432. Sustainable Transportation Planning. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Application of multimodal design principles, urban and regional planning approaches, and innovative transportation technologies associated with smart cities. Planning and design of transportation systems in order to enhance mobility while simultaneously reducing impacts on the environment, society, and the economy. Prerequisite: CEEG 330 or permission of the instructor.

CEEG 436. Advanced Traffic Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Introduction to traffic engineering elements, including traffic flow theory, queue theory, geometric design and signal design. Students will learn to use traffic design and simulation software. Prerequisite: CEEG 330 or permission of the instructor.

CEEG 439. Advanced Topics in Transportation. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:4
Topics will vary. Prerequisite: permission of the instructor.

CEEG 440. Unit Operations and Processes in Environmental Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Fundamentals of unit operations and processes used to remove pollutants from water, air, and soil such as coagulation, sedimentation, filtration, disinfection, adsorption, membrane separation, and biological transformations. Laboratory experiments reinforce theory and inform system design and evaluation. Prerequisites: CEEG 340 and open to Environmental Engineering majors. All others may waitlist. Crosslisted as CEEG 640.

CEEG 441. Environmental Engineering Biotechnology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:2
Theory and design of biological waste treatment systems for industrial, municipal and hazardous pollutants and natural biotransformation of pollutants in the environment. Laboratory experience on startup, operation, and analysis of systems that biodegrade pollutants and produce useful forms of energy. Prerequisite: CEEG 340 or instructor permission. Crosslisted as CEEG 641.

CEEG 443. Sustainable Design. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Students will learn principles of quantitative sustainable design for environmental systems, such as bio-based chemical production. They will apply technoeconomic analysis (TEA) and environmental life cycle assessment (LCA) to engineering design under uncertainty. Reading, discussion, and computational tools are central to the course. Crosslisted as CEEG 643.

CEEG 444. Hazardous Waste Management. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Identification of common hazardous chemicals and related industrial activities, determination of risk-based clean up levels for hazardous waste sites, toxicology, pump-and-treat ground water remediation, in situ bioremediation, legal and liability issues, and remedial action. Prerequisites: CEEG 340 and open to Environmental Engineering majors. All others may waitlist. Crosslisted as CEEG 644.

CEEG 445. Environmental Engineering Chemistry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Principles of aquatic chemistry and applications with emphasis on acid-base reactions, metal speciation and solubility, and oxidation-reduction reactions in water. Prerequisite: CEEG 340 or permission of the instructor.

CEEG 447. Sustainable Cities. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:2
This team taught course introduces students to the core concepts of sustainability and how they have been applied to promote sustainability in London, the UK, and Europe. This course is part of Bucknell in London core course. Prerequisite: permission of the instructor. Crosslisted as ENST 347.

CEEG 448. Air Quality / Hazardous Waste Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Air quality topics: regulations, airborne pollutants and sources, treatment technology design, and air quality/climate change relationship. Hazardous waste topics: identification of hazardous chemicals and sources, risk-based clean-up of contaminated sites, toxicology, pump-and-treat remediation, in situ bioremediation, legal and liability issues, and remedial action. Prerequisite: CEEG 340 or instructor permission. Crosslisted as CEEG 648.

CEEG 449. Advanced Topics in Environmental Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Advanced topics course for Civil and Environmental Engineering. Prerequisite: permission of the instructor.

CEEG 450. Geotechnical Engineering II. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Application of the theories and principles of soil mechanics to foundation design. Subsurface investigations; methods of analysis, design, and construction of foundations; bearing capacity and settlement of shallow and deep foundations; excavation and bracing; earth structures. Prerequisite: CEEG 350 or permission of the instructor.

CEEG 451. Environmental Geotechnology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Interaction between hazardous and toxic wastes and geotechnical properties of soils. Remediation of the subsurface environment. Prerequisite: CEEG 350 or permission of the instructor.

CEEG 452. Ground Improvement Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Application of soil mechanics principles to improving the engineering characteristics of soils. Includes mechanisms of soil stabilization, grouting, deep dynamic compaction, reinforced earth, sand drains, and preconsolidation. Prerequisites: CEEG 350 and permission of the instructor.

CEEG 453. Advanced Soil Mechanics. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
Advanced study of the theories of strength, hydraulic conductivity and compressibility. Critical review of soil origin and composition effects upon the physical and engineering properties of soils. Introduction to soil dynamics. Planning, execution, and interpretation of soil testing programs. Prerequisites: CEEG 350 and permission of the instructor.

CEEG 459. Advanced Topics in Geotechnical Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Topics will vary. Prerequisite: permission of the instructor.

CEEG 472. Construction Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Building methods and design of temporary structures such as formwork, sheet piles, soldier piles, scaffolding, etc. Calculation and optimization of earth moving operations, heavy civil construction management methods, and equipment selection. Prerequisite: ENGR 229. Crosslisted as CEEG 672.

CEEG 474. Safety and Risk Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Specific topics for this course will include: causes and prevention of Architecture-Engineering- Construction (AEC) Industry Incidents, OSHA regulations and requirements, design of accident prevention programs and the identification-analysis-response and management of AEC industry related risks. Prerequisite: CEEG 290. Crosslisted as CEEG 674.

CEEG 475. Forensic Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Introduction to identification, evaluation and analysis of a wide variety of engineering failures; failure investigation and the legal process; serviceability failure, material or system failure, design errors; expert witness testimony. Prerequisite: senior status.

CEEG 479. Advanced Topics in Construction Engineering and Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Topics will vary. Prerequisite: permission of the instructor.

CEEG 480. Special Topics in Civil and Environmental Engineering. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Individual projects in laboratory work, design, or library studies, depending upon the nature of the problem selected. Prerequisite: permission of the instructor.

CEEG 481. Undergraduate Research. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Original investigations in structural engineering, transportation engineering, environmental engineering, geotechnical engineering, or water resource engineering.

CEEG 492. Civil and Environmental Engineering Planning and Design I. 1 Credit.
Offered Fall Semester Only; Lecture hours:1,Lab:2
Planning process including feasibility study. Professional practice issues. Initial design of a project that integrates at least two subdisciplines of civil and environmental engineering. Projects are designed by teams and must involve analysis and synthesis to produce design solutions that achieve the desired "client" needs within specified constraints.

CEEG 493. Civil and Environmental Engineering Design II. .5 Credits.
Offered Spring Semester Only; Lecture hours:Varies,Other:2.5
Final, comprehensive design of a project that integrates at least two subdisciplines of civil and environmental engineering. Projects are designed by teams and must involve analysis and synthesis to produce design solutions that achieve the desired "client" needs within specified constraints. Prerequisite: CEEG 492.

CEEG 495. Advanced Topics in Engineering Mathematics. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Linear algebra and analytical/computational techniques for solving ordinary and partial differential equations relevant to engineering applications. Prerequisite: permission of the instructor. Crosslisted as CHEG 495 and ECEG 495 and MECH 495 and ENGR 695.

CEEG 4NT. Civil and Environmental Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Non-traditional study in civil and environmental engineering. Prerequisite: permission of the instructor.

Computer Engineering

Faculty

Professors: John C. Bravman (President), R. Alan Cheville, Richard J. Kozick, Joseph V. Tranquillo (Associate Provost for Transformative Teaching & Learning)

Associate Professors: Peter M. Jansson, Amal Kabalan, David F. Kelley, Alan Marchiori, Robert M. Nickel, Stewart Thomas, Michael S. Thompson (Chair)

Assistant Professors: Vajiheh Farhadi, Rebecca Thomas (Teaching)

Mission Statement

The rapidly changing field of computer engineering has great impact on human well-being. To meet the trust placed in our profession, students and faculty in the electrical & computer engineering department continually strive to be:

- Aware – we recognize the social and ethical dimensions of engineering.
- Engaged – we seek transformative experiences and intellectual challenges.
- Skillful – we merge knowledge with application in our professional identity.
- Articulate – we are agile communicators who effectively reach diverse audiences.
- Collaborative – we compassionately support each other to reach our full potential.
- Equitable – we create environments in which those from all backgrounds can succeed.
- Contemporary – we create new opportunities by designing solutions to meaningful problems.

Program Educational Objectives

Bucknell's broad liberal education allows graduates to choose from many possible career pathways. The computer engineering program supplements this liberal education with quantitative reasoning skills and the ability to address complex, abstract problems so that in the years following graduation, Bucknell alumni…

- can utilize and adapt engineering analysis and design knowledge and skills to successfully address professional challenges across a diverse spectrum of career paths;
- are respected in their chosen field due to their professionalism, ethical grounding, effective communication skills, ability to work with others, and understanding of the broader societal contexts of engineering;
- apply their problem-solving skills and passion for lifelong learning to their chosen endeavors;
- are actively engaged with their profession and community and continue to develop professionally, socially and personally.

Student Outcomes

At graduation, a Bucknell computer engineer:

Knows the foundational principles of engineering and the context needed to use them by demonstrating…
- an ability to identify, formulate and solve engineering problems by applying principles of engineering, science and mathematics;
- an ability to acquire and apply new knowledge as needed using appropriate learning strategies.

Possesses the skills and abilities needed to practice computer engineering by demonstrating…
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors;
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions;
- an ability to communicate effectively with a range of audiences.

Possesses the professionalism and attitudes needed to be a computer engineer by demonstrating…
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts;
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

The computer engineering program at Bucknell University is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org/).

The computer engineering program supplements Bucknell's broad, liberal education with quantitative reasoning skills and the ability to address complex, abstract problems so graduates can address challenging human, social and technical problems across a range of careers. The requirements in the first two years for the **Bachelor of Science in Computer Engineering** and **Bachelor of Science in Electrical Engineering** are identical to allow students to easily switch between programs.

Bachelor of Science in Computer Engineering

The **Bachelor of Science** in Computer Engineering requirements are:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ENGR 099	0	MATH 202	1
ENGR 100	1	PHYS 212[7]	1
MATH 201	1	ECEG 100	1

PHYS 211	1	Elective[1]	1
Foundation Seminar (W1)	1	ECEG 200[5]	.25
	4		**4.25**

Sophomore

First Semester	Credits	Second Semester	Credits
MATH 211	1	MATH 241[6]	1
ECEG 210	1	ECEG 270	1
ECEG 230[8]	.5	ECEG 247	1
ECEG 241	.5	ECEG 200[5]	.25
ECEG 200 (AU)[5]		Elective[1]	1
Elective[1]	1		
ECEG 201 (Take in fall or spring)	.5		
	4.5		**4.25**

Junior

First Semester	Credits	Second Semester	Credits
ECEG 370	1	CSCI 205	1
CSCI 204	1	Selected Course 1[2,3]	1
ECEG 200 (AU)[5]		ECEG 200[5]	.25
Elective[1]	1	Elective[1]	1
Elective[1]	1	Elective[1]	1
ECEG 301 (Take in fall or spring)	.5		
	4.5		**4.25**

Senior

First Semester	Credits	Second Semester	Credits
ECEG 400 (W2)	1	ECEG 401 (W2)	1
Selected Course 2[2,3]	1	Concentration Elective 2[2,4]	1
Concentration Elective 1[2,4]	1	ECEG 200[5]	.25
ECEG 200 AU[5]		Elective[1]	1
Elective[1]	1	Elective[1]	1
	4		**4.25**

Total Credits: 34

1. A student must choose electives that meet engineering college requirements for general education (p. 335). Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, a foundation seminar (FOUN or RESC), and two subsequent W2 courses. The two subsequent W2 courses will be satisfied by senior design. At least two electives must be in math or science. The choice of math or science electives may be determined by the concentration you choose — please consult with your adviser. Math/science elective options include 200-level or above courses in the natural sciences (physics & astronomy, chemistry, geology or biology) with the exception of PHYS 235 Applied Electronics, and 300-level or above mathematics courses with the exception of MATH 303 Probability, MATH 245 Linear Algebra, MATH 212 Differential Equations or MATH 227 Statistics and Engineering and may be taken if they are not already part of the student's plan of study. Other courses may be substituted with the approval of the department chair.
2. Courses may be taken out of the recommended sequence. The student should plan when to take courses in consultation with their adviser, taking into account plans for a concentration, study abroad, etc.
3. Selected courses: take two of ECEG 350, ECEG 431, ECEG 472 or CSCI 311.
4. Concentration electives: A total of 2.0 credits in 300-level or above ECEG and/or CSCI course or courses are required to complete a concentration. ECEG 408 Advanced Independent Study, CSCI 378 Individual Study in Computer Science, and CSCI 375 Teaching Assistant in CSCI may count for up to 1.0 credit of this requirement. ECEG 308 Independent Study and ECEG 341 Electrical & Computer Engineering Systems may not count for this requirement. Students not pursuing a concentration should take courses chosen in consultation with and approved by their academic adviser.
5. All ECE students are required to take ECEG 200 starting in the spring of their first year or upon entering the program. In fall semesters, the course will be audited, and in spring semesters, students will earn 0.25 credits. The spring grade considers work completed throughout both semesters of that academic year. Adjustments for students entering the program after the second semester will be addressed on a case-by-case basis. Students must cumulatively earn 1.0 credits for this course.
6. Students interested in a mathematics minor or considering graduate studies may choose to take MATH 240 **and** MATH 280 instead of MATH 241.
7. Or an equivalent, department-approved transfer course.

[8] Students may take CSCI 203 instead of ECEG 230. They should consult with their academic adviser to understand this option and the impact.

Notes:

[1] A student must choose electives that meet engineering college requirements for general education (p. 335). Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, a foundation seminar (FOUN or RESC), and two subsequent W2 courses. The two subsequent W2 courses will be satisfied by senior design. At least two electives must be in math or science. The choice of math or science electives may be determined by the concentration you choose — please consult with your adviser. Math/science elective options include 200-level or above courses in the natural sciences (physics and astronomy, chemistry, geology or biology) and 300-level or above mathematics courses with the exceptions of MATH 303 Probability and PHYS 235 Applied Electronics. Other courses may be substituted with the permission of the department chair.

[2] Courses may be taken out of the recommended sequence. The student should plan when to take courses in consultation with their adviser, taking into account plans for a concentration, study abroad, etc.

[3] Selected courses: take two of ECEG 350, ECEG 431, ECEG 472 or CSCI 311.

[4] Concentration electives: A total of 2.0 credits in 300-level or above ECEG and/or CSCI course or courses are required to complete a concentration. ECEG 408 Advanced Independent Study, CSCI 378 Individual Study in Computer Science, and CSCI 375 Teaching Assistant in CSCI may count for up to 1.0 credit of this requirement. ECEG 308 Independent Study and ECEG 341 Electrical & Computer Engineering Systems may not count for this requirement. Students not pursuing a concentration should take courses chosen in consultation with and approved by their academic adviser.

[5] All ECE students are required to take ECEG 200 starting in the spring of their first year or upon entering the program. In fall semesters, the course will be audited, and in spring semesters, students will earn 0.25 credits. The spring grade considers work completed throughout both semesters of that academic year. Adjustments for students entering the program after the second semester will be addressed on a case-by-case basis. Students must cumulatively earn 1.0 credits for this course.

[6] Students interested in a mathematics minor or considering graduate studies may choose to take MATH 240 **and** MATH 280 instead of MATH 241.

[7] Or an equivalent, department-approved transfer course.

[8] Students may take CSCI 203 instead of ECEG 230. They should consult with their academic adviser to understand this option and the impact.

Information on Minors

ECEG and CSCI courses that are required for the major and the two selected courses, see note [3] above, may **not** count toward a minor. Concentration electives and other electives may be counted toward a minor. Natural science and math courses, even if they are required, may be counted toward a minor.

Computer Engineering Concentrations

Students may select a concentration — a series of electives that develops expertise in a particular sub-discipline of computer engineering — that is recognized on the official student transcript. Only one concentration may be officially recognized. A concentration may require specific courses and concentration electives, math/science electives, and up to two free electives within a particular area chosen from the lists below. Students may petition the department to consider new or other courses; the final decision is made on a case-by-case basis by the department chair in consultation with the student's adviser.

Concentrations must be declared to the concentration adviser by the start of the junior year. A concentration is declared by notifying the respective concentration adviser. The respective concentration advisers for each concentration are listed with the description of each concentration. Final consideration for a concentration can be requested via completion and submission of a Concentration Declaration Form to the department office by Feb. 15th of the senior year. Because not all concentration electives are offered each year, students are highly advised to discuss their interest in a concentration with their adviser and the concentration adviser no later than the end of their sophomore year. Courses used toward a minor in any department at Bucknell may not be double-counted toward a concentration. The ECE department offers the following concentrations in computer engineering:

Data Science: In today's data-driven world, the integration of data science with engineering is becoming increasingly essential. The concentration in data science is designed to equip ECE students with the knowledge and skills needed to harness the power of data, enabling them to make informed decisions, optimize processes, and solve complex problems. For this concentration, students must take a set of prescribed classes and must also identify additional courses that fall within a student-identified theme. The theme must be shared with the concentration adviser and approved before the student registers for those courses, ideally by the junior year. Prof. Stu Thompson is the adviser for this concentration. The list below shows the courses that cover the various areas of this concentration.

- Math course: MATH 245 Linear Algebra
- Math/science elective: MATH 227 Statistics and Engineering
- Selected electives: ECEG 472 Digital Signals and Communications and ECEG 431 Computer Systems
- Concentration electives: two courses from the data science co-major that fit the student's chosen theme and adhere to ECE's concentration elective requirements
- Suggested open electives: DATA 250 Fundamentals of Data Science, MATH 230 Data Visualization & Computing

Internet of Things (IoT): captures how computing devices are embedded in nearly all products. IoT has four major areas – interaction, computation, storage and communication – and students must take one course representing each area. The areas covered by a particular course are listed with the course in the list below. Courses may only count for one area if multiple areas are listed. Prof. Stewart Thomas is the adviser for this concentration. The list below shows the courses that cover the various areas of this concentration.

- Selected courses: ECEG 350 Electronics I (computation), ECEG 431 Computer Systems (computation, storage), ECEG 472 Digital Signals and Communications (interaction, storage), CSCI 311 Algorithm Design & Analysis (computation)
- Concentration electives: ECEG 430 Mobile Computing (communication, interaction), ECEG 442 Digital VLSI Circuit Design (computation), ECEG 470 Communication and Information Systems (communication), ECEG 473 Digital Speech and Audio Processing (interaction, storage), ECEG 475 Computer Communication Networking (communication), ECEG 478 Machine Learning and Intelligent Systems (computation), ECEG 497 Wireless System Design (communication), CSCI 320 Computer Architecture (computation, storage), CSCI 341 Theory of Computation (computation). Other courses not offered on a regular basis may also count as concentration electives; please consult with your adviser.

Semiconducting Materials, Devices, and Systems: This concentration focuses on the fundamental physical principles that drive the operation of electronic devices. It covers the design and application of solid-state devices such as transistors, solar cells, lasers, and sensors. If you're interested in blending electrical engineering with physics, this concentration may align with your interests. Professor Amal Kabalan is the advisor for this concentration. The course requirements for this concentration include:

- Math course: MATH 212 Differential Equations
- Science Course: PHYS 222 Wave Mechanics and Quantum Physics
- Math/science elective: CHEM 203 General Chemistry for Engineers or MATH 245 Linear Algebra
- Selected courses: ECEG 351 Electronics II and ECEG 390 Theory and Applications of Electromagnetics
- Concentration electives – at least two of: ECEG 476 Electrical Control Systems , ENGR 240 Science of Materials, PHYS 303 Modern Optics, , PHYS 317 Thermodynamics and Statistical Mechanics, PHYS 332 Quantum Mechanics, PHYS 336 Mathematical Methods in Physics.
- Open elective recommendations: students are strongly encouraged to take at least one credit of independent study doing research.

Sustainable Energy: focuses on the technology of sustainable electrical energy production and distribution, including wind and solar. Prof. Peter Jansson is the adviser for this concentration. This concentration has the following course requirements:

- Math/Science electives: MATH 212 Differential Equations and CHEM 203 General Chemistry for Engineers
- Selected courses: ECEG 350 Electronics I and ECEG 461 Electrical Energy Conversion
- Concentration electives – at least two of: ECEG 462 Renewable Energy Systems, ECEG 476 Electrical Control Systems, , ENGR 240 Science of Materials, CEEG 242 Sustainability Principles for Engineers, CEEG 443 Sustainable Design or or either MECH 220 Mechanics or ENGR 229 Solid Mechanics I. Students may choose or CEEG 242 Sustainability Principles for Engineers toward this requirement, but not both.
- Open elective recommendation: ENST 236 Environmental Ethics

Signals and Systems: prepares students for work in diverse fields such as audio/video/multimedia technology, telecommunications, smart grid technology, control systems and machine learning. Students engage with fundamental approaches for the description and processing of quantitative information. These approaches are not only useful in the context of technical systems, but also in the context of non-technical systems such as societal, economic and biological systems. Prof. Robert Nickel is the adviser for this concentration. This concentration has the following course requirements:

- Math course: MATH 212 Differential Equations
- Math/science elective: MATH 245 Linear Algebra

- Selected courses – at least two of: ECEG 472 Digital Signals and Communications, ECEG 431 Computer Systems, ECEG 350 Electronics I, CSCI 311 Algorithm Design & Analysis
- Concentration electives – at least two of: ECEG 351 Electronics II, ECEG 470 Communication and Information Systems, ECEG 476 Electrical Control Systems, ECEG 473 Digital Speech and Audio Processing, ECEG 474 Neural Signals and Systems, ECEG 475 Computer Communication Networking, ECEG 478 Machine Learning and Intelligent Systems, CSCI 365 Image Processing & Analysis
- Open elective restrictions: none

Wireless Systems: prepares students for employment or graduate study in the area of wireless systems, which includes radio frequency (RF) design, microwave and millimeter-wave systems, antennas and digital communications. Applications include the Internet of Things; RFID; cellular, broadband and automotive wireless networks; satellite communications; radar; remote sensing; and satellite and terrestrial-based broadcasting. Prof. David Kelley is the adviser for this concentration. This concentration has the following course requirements:

- Math course: MATH 212 Differential Equations
- Math/science elective: MATH 245 Linear Algebra or MATH 350 Partial Differential Equations
- Selected courses: ECEG 350 Electronics I and ECEG 472 Digital Signals and Communications
- Concentration electives – at least two of: ECEG 470 Communication and Information Systems, ECEG 497 Wireless System Design, or ECEG 431 Computer Systems. One of the courses must be ECEG 470 Communication and Information Systems or ECEG 497 Wireless System Design, or both may be taken to fulfill the requirement.
- Open elective requirements: ECEG 351 Electronics II and ECEG 390 Theory and Applications of Electromagnetics
- Open elective recommendations: CHEM 203 General Chemistry for Engineers, PHYS 222 Wave Mechanics and Quantum Physics, PHYS 221 Classical Mechanics and ENGR 229 Solid Mechanics I

Formidable Challenges: prepares students to explore in depth a large societal issue that can be significantly impacted by electrical and computer engineering and focus their course of study on elective courses related to this issue. Examples could be drawn from the NAE Grand Challenges or the UN sustainable development goals and include topics such as sustainable energy, information technology and privacy, intelligent transportation, smart cities, etc. Prof. Alan Cheville is the adviser for this concentration. This concentration has the following requirements:

- Students must declare this concentration at the start of the junior year and have identified a challenge topic at that time. The department, in consultation with the student, will determine a concentration adviser for the student within the department.
- The student's concentration adviser in the department will consult with other faculty in the College of Engineering to ensure the student's work is aligned with the formidable challenge being investigated.
- Students are required to identify a second adviser outside of the College of Engineering in an area related to the formidable challenge they are investigating. The second adviser must agree to co-advise the student.
- This concentration will specify the two concentration electives and two free electives. These will be developed in concert with the student but ultimately approved by the advisers. The following additional criteria also apply.
- One concentration elective must be a one-credit independent study.
- The other concentration elective will be determined in concert with the advisers.
- Two open electives will be courses related to the issue the student is exploring and will be chosen in concert with their advisers. Earning a minor is strongly recommended to ensure sufficient depth of knowledge in a second area related to the formidable challenge.

Preparation for graduate study consists of courses suggested for those students who are planning to go to graduate school in computer engineering but do not have a specific area they want to pursue. This option provides a breadth of experience with a strong focus on the theoretical aspects of computer engineering to serve as a basis for graduate-level work. Students who have a particular interest should take the concentration that best aligns with it. Prof. Stu Thompson is the adviser for this concentration.

- Selected courses – at least two of: CSCI 311 Algorithm Design & Analysis, ECEG 431 Computer Systems, ECEG 350 Electronics I, ECEG 472 Digital Signals and Communications
- Concentration electives – at least two of: CSCI 315 Operating Systems Design, CSCI 341 Theory of Computation, CSCI 331 Compiler Optimization, CSCI 349 Introduction to Data Mining, ECEG 443 Computer Architecture or ECEG 495 Advanced Topics in Engineering Mathematics
- Open elective restrictions: students are strongly encouraged to take at least one credit of independent study doing research.

Bachelor of Arts/Management For Engineers - Bachelor of Science in Computer Engineering

The **Bachelor of Arts/Management for Engineers - Bachelor of Science** in Computer Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
See the first year of the 4-year computer engineering program.	4		4.25
	4		**4.25**

Sophomore

First Semester	Credits	Second Semester	Credits
See the sophomore year of the 4-year computer engineering program.	4.5		4.25
	4.5		**4.25**

Junior

First Semester	Credits	Second Semester	Credits
See the junior year of the 4-year computer engineering program.	4.5		4.25
	4.5		**4.25**

Senior

First Semester	Credits	Second Semester	Credits
See the senior year of the 4-year computer engineering program.	4		4.25
	4		**4.25**

Five Year

First Semester	Credits	Second Semester	Credits
Elective	1	Elective	1
Elective	1	Elective	1
Elective	1	Elective	1
Elective	1	Elective	1
	4		**4**

Total Credits: 42

- Students enrolled in one of the 5-year programs will work closely with an advisor from each major to determine a plan that is appropriate for their combination of interests.
- Courses used to fulfill the General Education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) requirements for engineering students should also fulfill the College of Arts & Sciences Core Curriculum (CASCC) (https://coursecatalog.bucknell.edu/collegeofartsandsciencescurricula/curriculaoverview/collegecorecurriculum/) requirements for those in the 5-year Engineering and Liberal Arts dual degree program or the Freeman College of Management General Education Curriculum (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/curriculaoverview/gened/) requirements for those in the 5-year Engineering and Management dual degree program.

At graduation a Bucknell computer engineer:

1) Knows the foundational principles of engineering and the context needed to use them by demonstrating…

- an ability to identify, formulate and solve engineering problems by applying principles of engineering, science and mathematics;
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

2) Possesses the skills and abilities needed to practice computer engineering by demonstrating…

- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors;
- an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions;
- an ability to communicate effectively with a range of audiences.

3) Possesses the professionalism and attitudes needed to be a computer engineer by demonstrating…

- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts;
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

Courses

ECEG 100. Foundations of Electrical and Computer Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Foundational concepts of electrical and computer engineering and introduction to electronic and computing system design principles. Students develop skills in simulation, testing, and programming. Students must have had or be taking MATH 201.

ECEG 101. Electrical and Computer Engineering Analysis. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to concepts, voltage, current, signals, network elements, and Kirchhoff's laws. Electrical measurements, energy and information generation, storage and transmission. Introduction to logic circuits and switching theory. Not for majors in electrical and computer engineering. Students must have had or be taking MATH 202.

ECEG 200. Individual Development. .25-.5 Credits.
Offered Both Fall and Spring; Lecture hours:1; Repeatable
A course that connects students across the department with a focus on reflection, integration of experiences, student agency, and student support. Provides time, space, and support for individual student development.

ECEG 201. Introduction to Electrical and Computer Engineering Design. .5 Credits.
Offered Either Fall or Spring; Lecture hours:3
This introductory ECE design course covers basics of electronic design focusing particularly on fabrication, measurement, and professional communication. Students will design, fabricate, and test electronic circuits and learn standards for manufacturability and professional communication. Prerequisite: permission of the instructor.

ECEG 205. Electrical and Computer Engineering Fundamentals. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Electrical measurement and physical quantities, sensors, sensor dynamics, and filters. Corequisite: MATH 202.

ECEG 210. Circuit Theory & Application. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Analysis and design of simple DC and AC circuits including Thevenin equivalents, time domain and sinusoidal response, power transfer, and complex impedance. Design of practical circuits and fundamentals of system integration. Prerequisite: ECEG 100 or permission of the instructor.

ECEG 230. Introduction to Engineering Programming. .5 Credits.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to algorithmic thinking and programming using Python. Topics include basic variable types, variable scope, declaring and using functions, list processing, essential control structures and data visualization. This course runs during the second half of the semester, after ECEG 241. Prerequisite: ECEG 100 or permission of the instructor.

ECEG 240. Digital System Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Comprehensive introduction to digital logic design. Number systems, combinational logic, synchronous sequential logic, and finite state machines. Overview of programmable logic devices and hardware description languages. Synthesis and optimization of designs from high-level and abstract definitions. Prerequisite: ECEG 100 or ECEG 101 or CSCI 206 or permission of the instructor.

ECEG 241. Foundations of Digital Systems. .5 Credits.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to digital logic and foundations of computing. Topics include number representation, Boolean algebra, combinational logic, synchronous sequential logic and finite state machines. This course runs during the first half of the semester. Prerequisite: ECEG 100 or permission of the instructor.

ECEG 247. Embedded Systems. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduces basic concepts in computer architecture, microcontroller assembly language, C programming, interrupt handling and microcontroller interfacing. Multitasking and real-time operating systems are presented. Laboratory activities emphasize systematic debugging. Prerequisites: (CSCI 203 or ECEG 230) and ECEG 241 or permission of instructor.

ECEG 270. Signals and Systems Theory. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduction to the general theory of analog systems with an emphasis on linear and time-invariant systems. Topics include elementary operator theory, Fourier/Laplace analysis, linear network analysis, elementary analog filter design, and sampling interpolation. Prerequisites: ECEG 210 and MATH 202.

ECEG 2NT. Electrical and Computer Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in electrical and computer engineering. Prerequisite: permission of the instructor.

ECEG 301. Praxis of Engineering Design. .5 Credits.
Offered Both Fall and Spring; Lecture hours:3
Hands-on, project-focused introduction to methods of addressing open-ended design challenges in electrical and computer engineering. Emphasis on undertaking design from a systems perspective and the use of graphical, textual, and other technical representations and models in design processes. Prerequisites: ECEG 201 and permission of the instructor.

ECEG 305. Technology as Service to Humanity. 1 Credit.
Offered Either Fall or Spring; Lecture hours:2,Other:4; Repeatable
Team-based, technology design projects in electrical and computer engineering focusing on service to the local community. Emphasis on engineering as service to humanity through project development. Completion of 200-level ECEG courses or equivalent experience required for enrollment. Prerequisites: ECEG 270 and ECEG 247.

ECEG 308. Independent Study. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Independent study for first-year students, sophomores, and juniors. Prerequisite: permission of the instructor.

ECEG 310. ECE Fall Seminar. .5 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Seminar course focusing on the skills, knowledge, and mindsets helpful in becoming a professional engineer. The course is divided into several short modules. Each module is devoted to a different topic and is taught by a different instructor. External speakers provide context for engineering practice. Taken second year or later.

ECEG 311. ECE Spring Seminar. .5 Credits.
Offered Spring Semester Only; Lecture hours:2
Seminar course focusing on the skills, knowledge, and mindsets helpful in becoming a professional engineer. The course is divided into several short modules. Each module is devoted to a different topic and is taught by a different instructor. External speakers provide context for engineering practice. Taken second year or later.

ECEG 341. Electrical & Computer Engineering Systems. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
This course explores the foundational concepts of electrical and computer engineering through the design and evaluation of embedded computing systems. Concepts explored will include basic electricity and circuits, digital logic, conversion of analog and digital signals, microcontroller programming and debugging, and sensor data analysis.

ECEG 350. Electronics I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to semiconductor components, device physics, and modeling. Applications and practical design considerations of circuits based on operational amplifiers, diodes, voltage regulators, transistors, and CMOS logic gates. Prerequisite: ECEG 210 or permission of the instructor.

ECEG 351. Electronics II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Fundamentals of p-n junctions, power electronics and sensors. The course’s emphasis is on the integration of electronics with sensors to design a system. Prerequisite: ECEG 350 or permission of the instructor.

ECEG 370. Probabilistic System & Data Analysis. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to the probabilistic description of signals, systems, and data. Topics include random variables/vectors/processes, statistical data characterization, expectations, information measures, and transformations of random data. The course includes a discussion of the foundations of detection, classification, and estimation theory. Prerequisite: ECEG 270.

ECEG 390. Theory and Applications of Electromagnetics. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
Applications of Maxwell's equations to the solution of problems involving electric and magnetic fields and transverse electromagnetic waves. Transmission line parameters, wave propagation, reflection from planar surfaces, polarization, and electromagnetic interaction with matter. Prerequisites: ECEG 210 and MATH 211.

ECEG 3NT. Electrical and Computer Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in electrical and computer engineering. Prerequisite: permission of the instructor.

ECEG 400. ECE Capstone Design I. 1 Credit.
Offered Fall Semester Only; Lecture hours:4,Lab:2
Engineering capstone design focusing on problem identification, project planning and logistics, and learning the divergent/convergent engineering design process in Electrical Computer Engineering. Year long capstone experience that concludes with ECEG 401. Prerequisite: ECEG 301 or permission of instructor.

ECEG 401. ECE Capstone Design II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
The continuation of ECEG 400 concludes the capstone sequence for electrical and computer engineering majors. Student teams develop, implement, and evaluate the value of their project for an external client. Prerequisite: ECEG 400 or permission of the instructor.

ECEG 402. Special Topics in Electrical or Computer Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2; Repeatable
Current topics of interest in electrical or computer engineering. This course includes a lab section. Crosslisted as ECEG 602.

ECEG 403. Special Topics in Electrical and Computer Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4; Repeatable
Current topics of interest in electrical and computer engineering. This course does not include a lab section. Crosslisted as ECEG 603.

ECEG 408. Advanced Independent Study. .25-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Advanced independent study for seniors. Prerequisite: permission of instructor.

ECEG 411. Neural Engineering. 1 Credit.
Offered Occasionally; Lecture hours:3,Recitation:1
Introduction to neural systems and engineering. Topics include neurophysiology, quantitative neural recording and stimulation models, neural signal acquisition and processing, clinical applications, and current field-wide challenges. Prerequisite: permission of the instructor. Crosslisted as BMEG 441 and ECEG 611.

ECEG 430. Mobile Computing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Mobile computing ecosystem including apps, devices, wireless networks, and back-end systems. Includes at least one major project; the specific course content will vary based on projects, student interest, and current technology trends. This course typically includes a considerable amount of software development. Prerequisite: CSCI 205 or permission of instructor. Crosslisted as CSCI 340 and ECEG 630.

ECEG 431. Computer Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
This course provides students the concepts, technologies, and skills needed for advanced study in computer engineering. It includes aspects of computer organization, computer architecture, operating systems, networking, and performance evaluation and the relationship between them. Prerequisite: CSCI 206, ECEG 247, or permission of the instructor.

ECEG 432. The Internet of Things. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A broad investigation into the design of internet-connected physical objects and the infrastructure that supports them. This hands-on course covers topics including embedded systems, wireless communication, internet protocols, cloud computing and security. Students will develop their own IoT system. Prerequisite: (CSCI 206 or CSCI 306) or ECEG 247. Crosslisted as CSCI 332 and ECEG 632.

ECEG 442. Digital VLSI Circuit Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Introduction to digital integrated circuit design, from wafer fabrication through structured design techniques. Teams conceptualize, design, simulate, layout, extract, and verify small VLSI systems using appropriate CAD tools. Prerequisites: ECEG 240 and ECEG 350 or permission of the instructor. Crosslisted as ECEG 642.

ECEG 443. Computer Architecture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores two important topics in computer architecture today: memory hierarchy and parallelism in all its forms. Students will use a hardware description language to implement concepts including pipelining, cache and branch prediction. Prerequisite: CSCI 206 or CSCI 306 or ECEG 247 or permission of the instructor. Crosslisted as CSCI 320 and ECEG 643.

ECEG 444. Advanced Digital Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:2,Other:2
Design of multi-part digital systems using contemporary digital components centered around a system-on-chip with a microprocessor and FPGA. Hardware description languages, specialized FPGA elements, peripheral interfacing and protocols, high-level synthesis. Prerequisites: ECEG 240 or permission of the instructor. Crosslisted as ECEG 644.

ECEG 461. Electrical Energy Conversion. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Three phase power circuits, transmission and distribution systems, transformer circuits, substation equipment, rotating machines, motor generator systems and introduction to renewable power systems. Prerequisite: ECEG 350 or permission of the instructor.

ECEG 462. Renewable Energy Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Engineering analysis of photovoltaic, wind and other renewable energy systems. Modeling of systems, resources and performance with an emphasis on grid-tied photovoltaic system optimization. Open to juniors and seniors in engineering. Crosslisted as ECEG 662.

ECEG 470. Communication and Information Systems. 1 Credit.
Lecture hours:3,Other:1
Digital and analog communication systems, elements of information theory and contributions of Claude Shannon, signal space, modulation, and case studies of modern digital communication systems. Prerequisite: ECEG 270 or permission of the instructor. Crosslisted as ECEG 670.

ECEG 472. Digital Signals and Communications. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduction to digital signal processing and digital communications. Topics: sampling theorem, discrete time Fourier transform (DTFT), Fourier series, fast Fourier transform (FFT), z-transform, digital filters, applications in audio and image processing, modulation techniques for digital signals. Prerequisite: ECEG 270 or permission of instructor. Crosslisted as ECEG 672.

ECEG 473. Digital Speech and Audio Processing. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Theory and application of digital speech and audio processing. Topics vary, but may include audio filtering, audio coding, room acoustics, digital analysis of speech and music signals, basic concepts of electronic music, and audio effects. Prerequisite: ECEG 270 or permission of the instructor. Crosslisted as ECEG 673.

ECEG 474. Neural Signals and Systems. 1 Credit.
Offered Occasionally; Lecture hours:3
Introduction to neural systems and signaling. Topics include neural physiology, models of action potential generation and synapse dynamics, neural networks and techniques of neural waveform analysis. Prerequisite: permission of the Instructor. Crosslisted as BMEG 441.

ECEG 475. Computer Communication Networking. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to computer networking using the seven-layer Open Systems Interconnection model. Hands-on exploration of the data link, network, transport, and application layers. Prerequisite: Junior status.

ECEG 476. Electrical Control Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Analysis of linear systems in time and Laplace transform domains, closed-loop transfer function, stability criteria, control system design with root locus, implementation with Arduino microcontrollers. Prerequisite: ECEG 270.

ECEG 478. Machine Learning and Intelligent Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Introduction to artificial intelligence (AI) and machine learning (ML) including fundamental principles and creation of software applications. The course covers both practical applications and the theoretical underpinnings of ML and AI technologies. MATH 211 and Python coding experience recommended. Prerequisite: MATH 202 or permission of instructor. Crosslisted as ECEG 678.

ECEG 479. Wireless Networks & Applications. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
This course explores the realm of modern wireless technologies and their practical applications, familiarizing students with the ever-evolving landscape of wireless networks. It equips students with a profound understanding of wireless communication principles, protocols and network architectures, covering fundamental concepts such as radio frequency fundamentals, as well as advanced topics. Crosslisted as CSCI 368 and ECEG 679.

ECEG 495. Advanced Topics in Engineering Mathematics. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Linear algebra and analytical computation techniques for solving ordinary and partial differential equations relevant to engineering applications. Prerequisite: permission of the instructor.Crosslisted as CEEG 495 and CHEG 495 and MECH 495 and ENGR 695.

ECEG 497. Wireless System Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Introduction to hardware aspects of wireless communication systems, including RF circuit design, transmitter and receiver architecture, antennas, and radio wave propagation. Prerequisite: ECEG 390 or concurrent enrollment or permission of the instructor. Crosslisted as ECEG 697.

Computer Science & Engineering

Faculty

Professors: Susan Baish (Teaching), Jessen Havill, Luiz Felipe Perrone

Associate Professors: Brian R. King, Alan Marchiori (Chair), Darakhshan Mir, Joshua V. Stough, Lea D. Wittie (Associate Chair)

Assistant Professors: Alexander Fuchsberger (Teaching), Samuel C. Gutekunst, Rajesh Kumar, Sing Chun Lee, Anne Spencer Ross, Todd Schmid, Edward Talmage

Visiting Assistant Professors: Chris Mitsch

Laboratory Director: Lily Romano

Mission Statement

The mission of the computer science department at Bucknell University is to provide degree programs and courses consistent with the missions of the University, the College of Arts & Sciences, and the College of Engineering, which meet the full range of needs of the talented, primarily undergraduate student body. To do this, the department provides the following:

- A Bachelor of Science in Computer Science & Engineering degree program in the College of Engineering for students seeking a rigorous engineering education in computer software and hardware systems with an emphasis on computer software (students interested in more of a focus on hardware should consider the computer engineering program).
- A bachelor of science degree program in the College of Arts & Sciences for students seeking a solid foundation in the sciences while gaining an in-depth preparation in computer science.
- A bachelor of arts degree program in the College of Arts & Sciences for students seeking a broad understanding of the liberal arts while gaining an in-depth preparation in computer science.
- A minor in computer science for students seeking basic competency in the discipline.
- Support for the interdisciplinary computer engineering program offered by the electrical & computer engineering department.
- Basic courses to support the general educational needs of students outside of the degree programs and minor.

The department's philosophy has the following four principles:

- Departmental programs are based on a common core curriculum that supports the breadth of the discipline.
- Computer science courses focus on principles; where appropriate, specific systems are studied to illuminate the principles.
- Courses in the core curriculum typically have a substantial faculty-directed, hands-on component in the form of a regularly scheduled laboratory.
- Departmental degree programs provide the background and experiences appropriate for entering the workplace at the entry level or a variety of graduate programs.

Program Educational Objectives

Computer science & engineering degree graduates will be successful professionals in computer science or other fields and will be recognized for qualities associated with their Bucknell education. Such qualities include critical thinking, problem-solving and effective communication. Graduates will be prepared to pursue lifelong learning, such as professional or advanced education.

Bachelor of Science in Computer Science & Engineering

The **Bachelor of Science in Computer Science & Engineering** requirements are:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ENGR 099	0	CSCI 203[1]	1
ENGR 100	1	MATH 202[2]	1
MATH 201[2]	1	PHYS 212	1
PHYS 211	1	Elective	1
Foundation Seminar (W1)	1		
	4		**4**
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
CSCI 201	.5	CSCI 202	.5
CSCI 204	1	CSCI 205	1
MATH 227[3]	1	MATH 241[4]	1
Elective	1	Elective	1
Elective	1	Elective	1
	4.5		**4.5**
Junior			
First Semester	**Credits**	**Second Semester**	**Credits**
CSCI 306	1	CSCI 307	.5
CSCI 345	1	CSCI 308	1
ECEG 341	1	CSCI 311	1
Elective	1	Math/Sci Elective[5]	1

		Elective	1
		4	**4.5**

Senior

First Semester	Credits	Second Semester	Credits
CSCI 315		1 CSCI 476[6]	1
CSCI 475[6]		.5 Elective	1
Elective		1 Elective	1
Elective		1 Elective	1
Math/Sci Elective[6]		1	
		4.5	**4**

Total Credits: 34

1 Requirement can be fulfilled with transfer credit for AP Computer Science A. Alternatively, students with programming experience may request placement into CSCI 204 and later substitute this requirement for a CSCI elective.

2 All students in computer science are encouraged to pursue a mathematics minor. Students who have met the requirements for MATH 201 Calculus I and/or MATH 202 Calculus II may want to consider a mathematics minor or a mathematics double major.

3 The MATH 227 requirement may be waived for students who have credit for a substantially similar course, such as AP Statistics or another statistics course required for a second major.

4 Any 1.5-credit or 2.0-credit combination of MATH 280 and MATH 240 or any 1.0-credit Combinatorics & Graph Theory course may replace MATH 241 (note that some MATH courses have MATH 211 as a prerequisite). Students seeking additional depth in mathematics are encouraged to pursue this route as MATH 211 and MATH 280 are prerequisites to several upper-level mathematics courses.

5 Any course with NSMC designation outside the Department of Computer Science.

6 CSCI 475 Senior Design I and CSCI 476 Senior Design II can be replaced by ENGR 452 Interdisciplinary Senior Design I and ENGR 453 Interdisciplinary Senior Design II.

Elective courses in a student's program must include:

- One social sciences course (SLSC);
- One arts & humanities course (ARHC);
- Three other courses including any combination of the following: foundation seminar, residential college courses, and other SLSC or ARHC courses.

Of all courses in the student's degree program:

- Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC), and two subsequent W2 courses. (CSCI 476 or ENGR 453 will count toward one of the required W2 courses.)
- One course must fulfill the college global perspectives requirement (GBCC).

Bachelor of Arts/Management for Engineers - Bachelor of Science in Computer Science & Engineering

The **Bachelor of Arts/Management for Engineers - Bachelor of Science in Computer Science & Engineering** requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099		0 CSCI 203[1]	1
ENGR 100		1 MATH 202[2]	1
MATH 201[2]		1 PHYS 212	1
PHYS 211		1 Elective	1
Foundation Seminar (W1)		1	
		4	**4**

Sophomore

First Semester	Credits	Second Semester	Credits
CSCI 201		.5 CSCI 202	.5
CSCI 204		1 CSCI 205	1
MATH 227[3]		1 MATH 241[4]	1

Elective	1	Elective	1
Elective	1	Elective	1
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
CSCI 306	1	CSCI 307	.5
CSCI 345	1	CSCI 308	1
ECEG 341	1	CSCI 311	1
Elective	1	Math/Sci Elective[5]	1
		Elective	1
	4		**4.5**

Senior

First Semester	Credits	Second Semester	Credits
CSCI 315	1	Elective	1
Elective	1	Elective	1
Elective	1	Elective	1
Math/Sci Elective[5]	1	Elective	1
	4		**4**

Five Year

First Semester	Credits	Second Semester	Credits
CSCI 475[6]	.5	CSCI 476[6]	1
Elective	1	Elective	1
Elective	1	Elective	1
Elective	1	Elective	1
Elective	1		
	4.5		**4**

Total Credits: 42

1. Requirement can be fulfilled with transfer credit for AP Computer Science A. Alternatively, students with programming experience may request placement into CSCI 204 and later substitute this requirement for a CSCI elective.
2. All students in computer science are encouraged to pursue a mathematics minor. Students who have met the requirements for MATH 201 Calculus I and/or MATH 202 Calculus II may want to consider a mathematics minor or a mathematics double major.
3. The MATH 227 requirement may be waived for students who have credit for a substantially similar course, such as AP Statistics or another statistics course required for a second major.
4. Any 1.5-credit or 2.0-credit combination of MATH 280 and MATH 240 or any 1.0-credit Combinatorics & Graph Theory course may replace MATH 241 (note that some MATH courses have MATH 211 as a prerequisite). Students seeking additional depth in mathematics are encouraged to pursue this route as MATH 211 and MATH 280 are prerequisites to several upper-level mathematics courses.
5. Any course with NSMC designation outside the Department of Computer Science.
6. CSCI 475 Senior Design I and CSCI 476 Senior Design II can be replaced by ENGR 452 Interdisciplinary Senior Design I and ENGR 453 Interdisciplinary Senior Design II.

Courses used to fulfill the General Education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) requirements for engineering students should also fulfill the College of Arts & Sciences Core Curriculum (CASCC) (https://coursecatalog.bucknell.edu/collegeofartsandsciencescurricula/curriculaoverview/collegecorecurriculum/) requirements for those in the 5-year Engineering & Liberal Arts dual degree program or the Freeman College of Management General Education Curriculum (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/curriculaoverview/gened/) requirements for those in the 5-year Engineering & Management dual degree program.

Of all courses in the student's degree program:

- Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC), and two subsequent W2 courses. (CSCI 476 or ENGR 453 will count toward one of the required W2 courses.)
- One course must fulfill the college Global Perspectives requirement (GBCC).

Graduates of the program are expected to demonstrate the following learning outcomes, which reflect ABET engineering and computing accreditation criteria:

Engineering:

1. Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed using appropriate learning strategies.

Computing:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

Courses

CSCI 187. Creative Computing and Society: Computing, Creativity and the Social Good. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:2
Introduces computing through creativity and examining social problems, guiding students to create visual artifacts that empower them to draw insights from data, complemented by discussions on computing's societal impact. This course does not count towards the computer science minor. Prerequisite: permission of the instructor. Not open to computer science majors and computer science engineering majors.

CSCI 1NT. Computer Science Non-traditional Study. .25-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in computer science. Prerequisite: permission of the instructor.

CSCI 201. Computer Science Seminar. .5 Credits.
Offered Fall Semester Only; Lecture hours:1.5
A variety of Computer Science related topics presented by faculty, alumni, student speakers, and other relevant guests. Presentations and discussions on the frontier of the discipline, professional development, ethics and societal issues, and other topics relevant to the profession. Prerequisite: open to sophomores. Others by permission of the instructor.

CSCI 202. Research Methods. .5 Credits.
Offered Spring Semester Only; Lecture hours:1.5
An introduction to research methodology in Computer Science, involving reading scientific literature, developing presentation skills, and learning to use various software packages. Prerequisites: open to first years and sophomores. Others by permission of the instructor.

CSCI 203. Introduction to Computer Science. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Students will learn the python programming language in order to explore the capabilities, limits, and social impact of computing. Application areas include image manipulation, data manipulation and visualization, introductions to predictive models, and ethical programming practices. Not open to students who have taken ANOP 203 or ECEG 230.

CSCI 204. Data Structures & Algorithms. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Introduction to data structures and algorithms using an object-oriented approach. Topics include software-engineering principles, object-oriented programming, recursion, basic data structures, algorithm analysis and team programming. Prerequisite: CSCI 203 or ECEG 230 or permission of the instructor.

CSCI 205. Software Engineering and Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Fundamentals of software design and software engineering. Students will participate in large-scale, team-based software development project. Prerequisite: CSCI 204 or permission of the instructor.

CSCI 278. Computer Science Individual Study. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:Varies; Repeatable
Independent study or project in computer science. Prerequisite: permission of the instructor.

CSCI 279. Topics in Computer Science. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies
Current topics of interest. Prerequisite: permission of the instructor.

CSCI 2NT. Computer Science Non-traditional Study. .25-2 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in computer science. Prerequisite: permission of the instructor.

CSCI 306. Computer Systems. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Fundamental concepts showcasing the integration of hardware and software. Topics include data representation, processor, memory, I/O, Unix system programming in C and assembly, introduction to operating systems, and development tools. Prerequisite: CSCI 204 or permission of the instructor. Not open to students who have taken CSCI 206.

CSCI 307. Computer Networks and Security. .5 Credits.
Offered Spring Semester Only; Lecture hours:1.5
Introduction to network programming including datagram and virtual circuit protocols. Introduction to topics in computer security such as authentication, integrity, access control, applied cryptography and secure programming. Prerequisite: CSCI 206 or CSCI 306.

CSCI 308. Programming Language Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Study of modern programming language paradigms (procedural, functional, logic, object-oriented). Introduction to the design and implementation of programming languages including syntax, semantics, data types and structures, control structures, run-time environments. Prerequisite: CSCI 205 or permission of the instructor. Not open to students who have taken CSCI 208.

CSCI 311. Algorithm Design & Analysis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Recitation:1
An introduction to standard patterns and techniques in algorithm design and tools for analyzing algorithmic performance. Students learn to evaluate algorithms, design new algorithmic solutions, and communicate the correctness and usefulness of their solutions. Prerequisite: MATH 241 or (MATH 240 and MATH 280) and CSCI 204.

CSCI 315. Operating Systems Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Introduction to operating system design including processor management, scheduling, memory management, resource allocation, file systems and concurrency. Prerequisite: CSCI 306.

CSCI 320. Computer Architecture. 1 Credit.
Offered Fall Semester Only; Lecture hours:3
Explores two important topics in computer architecture today: memory hierarchy and parallelism in all its forms. Students will use a hardware description language to implement concepts including pipelining, cache and branch prediction. Prerequisite: CSCI 206 or CSCI 306 or ECEG 247 or permission of the instructor. Crosslisted as ECEG 443 and ECEG 643.

CSCI 331. Compiler Optimization. 1 Credit.
Offered Occasionally; Lecture hours:3
Project based introduction to compiler optimization for theoretical and practical issues such as run-time, memory usage, code robustness, and security. Prerequisite: CSCI 308.

CSCI 332. The Internet of Things. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A broad investigation into the design of internet-connected physical objects and the infrastructure that supports them. This hands-on course covers topics including embedded systems, wireless communication, internet protocols, cloud computing and security. Students will develop their own IoT system. Prerequisite: (CSCI 206 or CSCI 306) or ECEG 247. Crosslisted as ECEG 432 and ECEG 632.

CSCI 341. Theory of Computation. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Recitation:1
Finite automata, regular sets, pushdown automata, context-free grammars. Turing machines, recursive functions and undecidability. Prerequisite: MATH 241 or MATH 280.

CSCI 345. Computers and Society. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Analysis of the impact of computing on society through the application of deontological and consequence-based ethical theories and professional codes of ethics. Students will learn to analyze the impacts of computing on the fundamental values of society so as to be able to create systems that don't oppose social progress.

CSCI 349. Introduction to Data Mining. 1 Credit.
Offered Occasionally; Lecture hours:3
Data preprocessing, statistical modeling, basic machine learning algorithms for mining large datasets. Topics include association analysis, frequent pattern mining, classification, and clustering. Prerequisites: CSCI 311 and (MATH 216 or MATH 226 or MATH 227).

CSCI 351. Distributed Computing. 1 Credit.
Offered Occasionally; Lecture hours:3
An introduction to concurrency, communication, and fault-tolerance. Students learn fundamental models of distributed computing and use them to study classic problems and their solutions or impossibility. Examples include consensus, mutual exclusion, distributed data structures and more. We focus primarily on theoretical results, also applying them in practical implementations.

CSCI 358. Human Computer Interaction. 1 Credit.
Offered Occasionally; Lecture hours:3
In this interdisciplinary course, we will study research at the intersection of people and computing. Through a variety of prototypes that we'll build (3D user interfaces, visual design, data communication, intelligent user interfaces, etc), we will deliberately practice processes that result in useful, usable and maybe even inspirational computer interfaces.

CSCI 359. Fairness, Privacy, & Transparency When Learning From Data. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
The course enables students to audit and analyze data-centric systems and processes that are used to make decisions about people's lives and understand the bias, fairness, privacy, and transparency implications of these systems. We will read, discuss, and implement ideas from recently published research articles in this upcoming area.

CSCI 363. Computer Networks. 1 Credit.
Offered Occasionally; Lecture hours:3
Principles and design of networked computing systems and application programs. Topics include reliable communications medium access control, security, routing, transport, congestion control and networked applications. Prerequisite: CSCI 306 or ECEG 247.

CSCI 365. Image Processing & Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Imaging is everywhere! In this course, we will cover broadly the acquisition, processing, and analysis of digital images, covering topics ranging from the human visual system, to image and video compression algorithms, to pattern recognition and machine learning within the context of automatic image understanding.

CSCI 368. Wireless Networks & Applications. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
This course explores the realm of modern wireless technologies and their practical applications, familiarizing students with the ever-evolving landscape of wireless networks. It equips students with a profound understanding of wireless communication principles, protocols and network architectures, covering fundamental concepts such as radio frequency fundamentals, as well as advanced topics. Crosslisted as ECEG 479 and ECEG 679.

CSCI 375. Teaching Assistant in CSCI. .25-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:Varies; Repeatable
Teaching assistant to support mastery in a core computer science course. Written learning objectives and assessment policies will be developed with the course instructor. Prerequisites: by permission only.

CSCI 376. Computer Science Honors Thesis. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Independent work on computer science honors thesis. Prerequisite: permission of the instructor.

CSCI 378. Individual Study in Computer Science. .5-1 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Independent study in computer science. Recent areas include graph algorithms, computer security, distributed computing, graphics, programming languages, software engineering, web information retrieval. Prerequisites: junior standing and permission of the instructor.

CSCI 379. Topics in Computer Science. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Current topics of interest.

CSCI 3NT. Computer Science Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study course in computer science. Prerequisite: permission of the instructor.

CSCI 475. Senior Design I. .5 Credits.
Offered Fall Semester Only; Lecture hours:1,Other:2
A recognized software engineering methodology will be used with all phases of a senior design project. Written work will include a technical report about the project, a feasibility report, and a requirements specification document. Prerequisite: permission of the instructor. Not open to students who have taken ENGR 452.

CSCI 476. Senior Design II. 1 Credit.
Offered Spring Semester Only; Lecture hours:2,Other:2
Students undertake several cycles of delivery, each including a design document, product implementation, testing, and feedback. Students produce technical and user's manuals for the final version. Class presentations of designs and implementations. Includes public presentation of the final product and design process. Prerequisites: CSCI 475 and permission of the instructor.

Electrical Engineering

Faculty

Professors: John C. Bravman (President), R. Alan Cheville, Richard J. Kozick, Joseph V. Tranquillo (Associate Provost for Transformative Teaching & Learning)

Associate Professors: Peter M. Jansson, Amal Kabalan, David F. Kelley, Alan Marchiori, Robert M. Nickel, Stewart Thomas, Michael S. Thompson (Chair)

Assistant Professors: Vajiheh Farhadi, Rebecca Thomas (Teaching)

Mission Statement

The rapidly changing field of electrical engineering has great impact on human well-being. To meet the trust placed in our profession, students and faculty in the electrical & computer engineering department continually strive to be:

- Aware – we recognize the social and ethical dimensions of engineering.
- Engaged – we seek transformative experiences and intellectual challenges.
- Skillful – we merge knowledge with application in our professional identity.
- Articulate – we are agile communicators who effectively reach diverse audiences.
- Collaborative – we compassionately support each other to reach our full potential.
- Equitable – we create environments in which those from all backgrounds can succeed.
- Contemporary – we create new opportunities by designing solutions to meaningful problems.

Program Educational Objectives

Bucknell's broad, liberal education allows graduates to choose from many possible career pathways. The electrical engineering program supplements this liberal education with quantitative reasoning skills and the ability to address complex, abstract problems so that in the years following graduation, Bucknell alumni…

- can utilize and adapt engineering analysis and design knowledge and skills to successfully address professional challenges across a diverse spectrum of career paths.
- are respected in their chosen field due to their professionalism, ethical grounding, effective communication skills, ability to work with others and understanding of the broader societal contexts of engineering.
- apply their problem-solving skills and passion for lifelong learning to their chosen endeavors.
- are actively engaged with their profession and community and continue to develop professionally, socially and personally.

Student Outcomes

At graduation, a Bucknell electrical engineer:

Knows the foundational principles of engineering and the context needed to use them by demonstrating…
- an ability to identify, formulate and solve engineering problems by applying principles of engineering, science and mathematics;
- an ability to acquire and apply new knowledge as needed using appropriate learning strategies.

Possesses the skills and abilities needed to practice electrical engineering by demonstrating…
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors;
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions;
- an ability to communicate effectively with a range of audiences.

Possesses the professionalism and attitudes needed to be an electrical engineer by demonstrating…
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts;
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

The electrical engineering degree program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org/).

The electrical engineering program supplements Bucknell's broad, liberal education with quantitative reasoning skills and the ability to address complex, abstract problems so that graduates can address challenging human, social and technical problems across a range of careers. The requirements in the first two years for the Bachelor of Science in Electrical Engineering and the Bachelor of Science in Computer Engineering are identical to allow students to easily switch between programs.

Bachelor of Science in Electrical Engineering

The **Bachelor of Science** in Electrical Engineering requirements are:

First Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ENGR 099	0	MATH 202	1
ENGR 100	1	PHYS 212[6]	1
MATH 201	1	ECEG 100	1
PHYS 211	1	ECEG 200[5]	.25
Foundation Seminar (W1)	1	Elective[1]	1
	4		4.25
Sophomore			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 211	1	MATH 212 or 245	1
ECEG 210	1	ECEG 270	1
ECEG 230[7]	.5	ECEG 247	1
ECEG 241	.5	ECEG 200[5]	.25
ECEG 200 (AU)[5]		Elective[1]	1
Elective[1]	1		
ECEG 201 (Take in fall or spring)	.5		
	4.5		4.25
Junior			
First Semester	**Credits**	**Second Semester**	**Credits**
ECEG 370	1	ECEG 390	1
ECEG 350	1	ECEG 200[5]	.25
ECEG 200 AU[5]		Selected Course 1[2,3]	1
Elective[1]	1	Elective[1]	1
Elective[1]	1	Elective[1]	1
ECEG 301 (Take in fall or spring)	.5		
	4.5		4.25
Senior			
First Semester	**Credits**	**Second Semester**	**Credits**
ECEG 400 (W2)	1	ECEG 401 (W2)	1
Selected Course 2[2,3]	1	Concentration Elective 2[2,4]	1
Concentration	1	ECEG 200[5]	.25
Elective 1[2,4]		Elective[1]	1
ECEG 200 (AU)[5]		Elective[1]	1
Elective[1]	1		
	4		4.25
Total Credits: 34			

Notes:

[1] A student must choose electives that meet engineering college requirements for general education (p. 335). Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC). The two subsequent W2 courses will be satisfied by senior design. One elective must be PHYS 222 Wave Mechanics and Quantum Physics or CHEM 203

General Chemistry for Engineers. In addition, at least one elective must be in either math or science. The choice of math or science electives may be determined by the concentration you choose; please consult with your adviser.

Math/science elective options include 200-level or above courses in the natural sciences (physics and astronomy, chemistry, geology or biology) and 300-level or above mathematics courses with the exceptions of MATH 303 Probability and PHYS 235 Applied Electronics. Other courses may be substituted with the permission of the department chair.

[2] These courses may be taken out of the recommended sequence. The student should choose when to take these courses in consultation with their adviser taking into account plans for a concentration, study abroad, etc.

[3] Selected courses: take two of ECEG 351, ECEG 431, ECEG 461 or ECEG 472.

[4] Concentration electives: A total of 2.0 credits in 300-level or above ECEG and/or CSCI course or courses required to complete a concentration. ECEG 408 Advanced Independent Study, CSCI 378 Individual Study in Computer Science, and CSCI 375 Teaching Assistant in CSCI may count for up to 1.0 credit of this requirement. ECEG 308 Independent Study and ECEG 341 Electrical & Computer Engineering Systems may not count for this requirement. Students not pursuing a concentration should take courses chosen in consultation with and approved by their academic adviser.

[5] All ECE students are required to take ECEG 200 starting in the spring of their first year or upon entering the program. In fall semesters, the course will be audited, and in spring semesters, students will earn 0.25 credits. The spring grade considers work completed throughout both semesters of that academic year. Adjustments for students entering the program after the second semester will be addressed on a case-by-case basis. Students must cumulatively earn 1.0 credits for this course.

[6] Or an equivalent, department-approved transfer course.

[7] Students may take CSCI 203 instead of ECEG 230. They should consult with their academic adviser to understand this option and the impact.

Information on Minors

ECEG courses that are required for the major and the two selected courses, see note [3] above, may **not** count toward a minor. Concentration electives and other electives may be counted toward a minor. Natural science and math courses, even if they are required, may be counted toward a minor.

Electrical Engineering Concentrations

Students may select a concentration — a series of electives that develops expertise in a particular sub-discipline of electrical engineering — that is recognized on the official student transcript. Only one concentration may be officially recognized. A concentration may require specific selected courses and concentration electives, math/science electives, and up to two free electives within a particular area chosen from the lists below. Students may petition the department to consider new or other courses; the final decision is made on a case-by-case basis by the department chair in consultation with the student's adviser.

Concentrations must be declared to the concentration adviser by the start of the junior year. A concentration is declared by notifying the respective concentration adviser. The respective concentration advisers for each concentration are listed with the description of each concentration. Final consideration for a concentration is done via completion and submission of a Concentration Declaration Form to the department office by Feb. 15 of the senior year. Because not all concentration electives are offered each year, students are highly advised to discuss their interest in a concentration with their adviser and the concentration adviser no later than the end of their sophomore year. Courses used toward a minor in any department at Bucknell may not double count toward a concentration. The ECE department offers the following concentrations in electrical engineering:

Data Science: In today's data-driven world, the integration of data science with engineering is becoming increasingly essential. The concentration in data science is designed to equip ECE students with the knowledge and skills needed to harness the power of data, enabling them to make informed decisions, optimize processes and solve complex problems. For this concentration students must take a set of prescribed classes and must also identify additional courses that fall within a student-identified theme. The theme must be shared with the concentration adviser and approved before the student registers for those courses, ideally by the junior year. Professor Stu Thompson is the adviser for this concentration. The list below shows the courses that cover the various areas of this concentration.

- Math course: MATH 245 Linear Algebra.
- Math/science elective: MATH 227 Statistics and Engineering.
- Selected electives: ECEG 472 Digital Signals and Communications and ECEG 431 Computer Systems.
- Concentration electives: two courses from the data science co-major that fit the student's chosen theme and adhere to ECE's concentration elective requirements.
- Suggested open electives: DATA 250 Fundamentals of Data Science, MATH 230 Data Visualization & Computing.

Semiconducting Materials, Devices and Systems: This concentration focuses on the fundamental physical principles that drive the operation of electronic devices. It covers the design and application of solid-state devices such as transistors, solar cells, lasers and sensors. If you're interested

in blending electrical engineering with physics, this concentration may align with your interests. Professor Amal Kabalan is the adviser for this concentration. The course requirements for this concentration include:

- Math course: MATH 212 Differential Equations.
- Science course: PHYS 222 Wave Mechanics and Quantum Physics.
- Math/science elective: CHEM 203 General Chemistry for Engineers or MATH 245 Linear Algebra.
- Selected courses: ECEG 351 Electronics II and ECEG 390 Theory and Applications of Electromagnetics.
- Concentration electives – at least two of: ECEG 476 Electrical Control Systems, ENGR 240 Science of Materials, PHYS 303 Modern Optics, PHYS 317 Thermodynamics and Statistical Mechanics, PHYS 332 Quantum Mechanics, PHYS 336 Mathematical Methods in Physics.
- Open elective recommendations: students are strongly encouraged to take at least one credit of independent study doing research.

Sustainable Energy: focuses on the technology of sustainable electrical energy production and distribution including wind and solar. Professor Peter Jansson is the adviser for this concentration. This concentration has the following course requirements:

- Math course: MATH 212 Differential Equations.
- Math/science elective: CHEM 203 General Chemistry for Engineers.
- Selected courses: ECEG 351 Electronics II and ECEG 461 Electrical Energy Conversion.
- Concentration electives – at least two of: ECEG 462 Renewable Energy Systems, ECEG 476 Electrical Control Systems,ENGR 240 Science of Materials, CEEG 242 Sustainability Principles for Engineers, CEEG 443 Sustainable Design or either MECH 220 Mechanics or ENGR 229 Solid Mechanics I.
- Open elective recommendations: ENST 236 Environmental Ethics.

Signals & Systems: prepares students for work in diverse fields such as audio/video/multimedia technology, telecommunications, smart grid technology, control systems and machine learning. Students engage with fundamental approaches for the description and processing of quantitative information. These approaches are not only useful in the context of technical systems, but also in the context of non-technical systems such as societal, economic and biological systems. Professor Robert Nickel is the adviser for this concentration. This concentration has the following course requirements:

- Math course: MATH 212 Differential Equations.
- Math/science elective: MATH 245 Linear Algebra.
- Selected courses – at least two of: ECEG 472 Digital Signals and Communications, ECEG 351 Electronics II, ECEG 431 Computer Systems.
- Concentration electives — at least two of: ECEG 470 Communication and Information Systems, ECEG 476 Electrical Control Systems, ECEG 473 Digital Speech and Audio Processing, ECEG 474 Neural Signals and Systems, ECEG 475 Computer Communication Networking, ECEG 478 Machine Learning and Intelligent Systems or CSCI 365 Image Processing & Analysis.
- Open elective restrictions: none.

Wireless Systems: prepares students for employment or graduate study in the area of wireless systems, which includes radio frequency (RF) design, microwave and millimeter-wave systems, antennas, and digital communications. Applications include the Internet of Things; RFID; cellular, broadband and automotive wireless networks; satellite communications; radar; remote sensing; and satellite and terrestrial-based broadcasting. Professor David Kelley is the adviser for this concentration. This concentration has the following course requirements:

- Math course: MATH 212 Differential Equations.
- Math/science elective: MATH 245 Linear Algebra or MATH 350 Partial Differential Equations.
- Selected courses: ECEG 351 Electronics II and ECEG 472 Digital Signals and Communications.
- Concentration electives – at least two of: ECEG 470 Communication and Information Systems, ECEG 497 Wireless System Design, or ECEG 431 Computer Systems. One of the courses must be ECEG 470 or ECEG 497, or both may be taken to fulfill the requirement.
- Open elective recommendations: CHEM 203 General Chemistry for Engineers, PHYS 222 Wave Mechanics and Quantum Physics, PHYS 221 Classical Mechanics and ENGR 229 Solid Mechanics I.

Preparation for graduate studies is suggested for those students who are planning to go to graduate school in electrical engineering but do not yet have a specific area they are interested in pursuing. This option provides a breadth of experience with a strong focus on the theoretical aspects of electrical engineering to serve as a basis for graduate level work. Students who wish to study a particular sub-discipline should take the concentration that best aligns with it. This concentration has the following course requirements:

- Math course: MATH 212 Differential Equations.
- Science course: CHEM 203 General Chemistry for Engineers.
- Math/science elective: MATH 245 Linear Algebra.
- Selected courses: ECEG 472 Digital Signals and Communications, the other to be determined in consultation with adviser.
- Concentration electives: MATH 280 Logic, Sets, and Proofs and ECEG 495 Advanced Topics in Engineering Mathematics.
- Open elective restrictions: students are strongly encouraged to take at least one credit of independent study doing research.

Internet of Things (IoT): captures how computing devices are embedded in nearly all products. IoT has four major areas – interaction, computation, storage and communication – and students must take one course representing each area. The areas covered by a particular course are listed with the course in the list below. Courses may only count for one area if multiple areas are listed. Professor Stewart Thomas is the adviser for this concentration. The list below shows the courses that cover the various areas of this concentration:

- Selected courses: ECEG 431 Computer Systems (computation, storage), ECEG 472 Digital Signals and Communications.
- Concentration electives: ECEG 430 Mobile Computing (communication, interaction), ECEG 442 Digital VLSI Circuit Design (computation), ECEG 470 Communication and Information Systems (communication), ECEG 473 Digital Speech and Audio Processing (interaction, storage), ECEG 475 Computer Communication Networking (communication), ECEG 478 Machine Learning and Intelligent Systems (computation), ECEG 497 Wireless System Design (communication), ECEG 443 Computer Architecture (computation, storage). Other courses not offered on a regular basis may also count as concentration electives; please consult with the concentration adviser.
- ECEG 350 Electronics I may be used to satisfy the computation area.

Formidable Challenges prepare students to explore in depth a large societal issue that can be significantly impacted by electrical and computer engineering and focus their course of study on elective courses related to this issue. Examples could be drawn from the NAE Grand Challenges or the UN sustainable development goals and include topics such as sustainable energy, information technology and privacy, intelligent transportation, smart cities, etc. Professor Alan Cheville is the adviser for this concentration. This concentration has the following requirements:

- Students must declare this concentration at the start of the junior year and have identified a challenge topic at that time. The department, in consultation with the student, will determine a concentration adviser with the department for the student.
- The student's concentration adviser in the department will consult with other faculty in the College of Engineering to ensure the student's work is aligned with the formidable challenge being investigated.
- Students are required to identify a second adviser outside of the College of Engineering in an area related to the formidable challenge they are investigating. The second adviser must agree to co-advise the student.
- This concentration will specify the two concentration electives and two free electives. These will be developed in concert with the student but ultimately approved by the advisers. The following additional criteria also apply:
- One concentration elective must be a one-credit independent study.
- The other concentration elective will be determined in concert with the advisers.
- Two open electives will be courses related to the issue the student is exploring and will be chosen in concert with their advisers. Earning a minor is strongly recommended to ensure sufficient depth of knowledge in a second area related to the formidable challenge.

Bachelor of Arts/Management for Engineers - Bachelor of Science in Electrical Engineering

The **Bachelor of Arts/Management for Engineers - Bachelor of Science** in Electrical Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
See the first year of the 4-year computer engineering program.	4		4.25
	4		**4.25**

Sophomore

First Semester	Credits	Second Semester	Credits
See the sophomore year of the 4-year computer engineering program.	4.5		4.25
	4.5		**4.25**

Junior

First Semester	Credits	Second Semester	Credits
See the junior year of the 4-year computer engineering program.	4.5		4.25
	4.5		**4.25**

Senior

First Semester	Credits	Second Semester	Credits
See the senior year of the 4-year computer engineering program.	4		4.25
	4		**4.25**

Five Year

First Semester	Credits	Second Semester	Credits
Elective	1	Elective	1
Elective	1	Elective	1
Elective	1	Elective	1
Elective	1	Elective	1
	4		**4**

Total Credits: 42

- Students enrolled in one of the 5-year programs will work closely with an adviser from each major to determine a plan that is appropriate for their combination of interests.
- Courses used to fulfill the General Education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) requirements for engineering students should also fulfill the College of Arts & Sciences Core Curriculum (CASCC) (https://coursecatalog.bucknell.edu/collegeofartsandsciencescurricula/curriculaoverview/collegecorecurriculum/) requirements for those in the 5-year Engineering & Liberal Arts dual degree program or the Freeman College of Management General Education Curriculum (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/curriculaoverview/gened/) requirements for those in the 5-year Engineering & Management dual degree program.

At graduation a Bucknell electrical engineer:

1) Knows the foundational principles of engineering and the context needed to use them by demonstrating…

- an ability to identify, formulate and solve engineering problems by applying principles of engineering, science and mathematics;
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

2) Possesses the skills and abilities needed to practice electrical engineering by demonstrating…

- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors;
- an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions;
- an ability to communicate effectively with a range of audiences.

3) Possesses the professionalism and attitudes needed to be an electrical engineer by demonstrating…

- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts;
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

Courses

ECEG 100. Foundations of Electrical and Computer Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Foundational concepts of electrical and computer engineering and introduction to electronic and computing system design principles. Students develop skills in simulation, testing, and programming. Students must have had or be taking MATH 201.

ECEG 101. Electrical and Computer Engineering Analysis. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to concepts, voltage, current, signals, network elements, and Kirchhoff's laws. Electrical measurements, energy and information generation, storage and transmission. Introduction to logic circuits and switching theory. Not for majors in electrical and computer engineering. Students must have had or be taking MATH 202.

ECEG 200. Individual Development. .25-.5 Credits.
Offered Both Fall and Spring; Lecture hours:1; Repeatable
A course that connects students across the department with a focus on reflection, integration of experiences, student agency, and student support. Provides time, space, and support for individual student development.

ECEG 201. Introduction to Electrical and Computer Engineering Design. .5 Credits.
Offered Either Fall or Spring; Lecture hours:3
This introductory ECE design course covers basics of electronic design focusing particularly on fabrication, measurement, and professional communication. Students will design, fabricate, and test electronic circuits and learn standards for manufacturability and professional communication. Prerequisite: permission of the instructor.

ECEG 205. Electrical and Computer Engineering Fundamentals. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Electrical measurement and physical quantities, sensors, sensor dynamics, and filters. Corequisite: MATH 202.

ECEG 210. Circuit Theory & Application. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Analysis and design of simple DC and AC circuits including Thevenin equivalents, time domain and sinusoidal response, power transfer, and complex impedance. Design of practical circuits and fundamentals of system integration. Prerequisite: ECEG 100 or permission of the instructor.

ECEG 230. Introduction to Engineering Programming. .5 Credits.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to algorithmic thinking and programming using Python. Topics include basic variable types, variable scope, declaring and using functions, list processing, essential control structures and data visualization. This course runs during the second half of the semester, after ECEG 241. Prerequisite: ECEG 100 or permission of the instructor.

ECEG 240. Digital System Design. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Comprehensive introduction to digital logic design. Number systems, combinational logic, synchronous sequential logic, and finite state machines. Overview of programmable logic devices and hardware description languages. Synthesis and optimization of designs from high-level and abstract definitions. Prerequisite: ECEG 100 or ECEG 101 or CSCI 206 or permission of the instructor.

ECEG 241. Foundations of Digital Systems. .5 Credits.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to digital logic and foundations of computing. Topics include number representation, Boolean algebra, combinational logic, synchronous sequential logic and finite state machines. This course runs during the first half of the semester. Prerequisite: ECEG 100 or permission of the instructor.

ECEG 247. Embedded Systems. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduces basic concepts in computer architecture, microcontroller assembly language, C programming, interrupt handling and microcontroller interfacing. Multitasking and real-time operating systems are presented. Laboratory activities emphasize systematic debugging. Prerequisites: (CSCI 203 or ECEG 230) and ECEG 241 or permission of instructor.

ECEG 270. Signals and Systems Theory. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduction to the general theory of analog systems with an emphasis on linear and time-invariant systems. Topics include elementary operator theory, Fourier/Laplace analysis, linear network analysis, elementary analog filter design, and sampling interpolation. Prerequisites: ECEG 210 and MATH 202.

ECEG 2NT. Electrical and Computer Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in electrical and computer engineering. Prerequisite: permission of the instructor.

ECEG 301. Praxis of Engineering Design. .5 Credits.
Offered Both Fall and Spring; Lecture hours:3
Hands-on, project-focused introduction to methods of addressing open-ended design challenges in electrical and computer engineering. Emphasis on undertaking design from a systems perspective and the use of graphical, textual, and other technical representations and models in design processes. Prerequisites: ECEG 201 and permission of the instructor.

ECEG 305. Technology as Service to Humanity. 1 Credit.
Offered Either Fall or Spring; Lecture hours:2,Other:4; Repeatable
Team-based, technology design projects in electrical and computer engineering focusing on service to the local community. Emphasis on engineering as service to humanity through project development. Completion of 200-level ECEG courses or equivalent experience required for enrollment. Prerequisites: ECEG 270 and ECEG 247.

ECEG 308. Independent Study. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Independent study for first-year students, sophomores, and juniors. Prerequisite: permission of the instructor.

ECEG 310. ECE Fall Seminar. .5 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Seminar course focusing on the skills, knowledge, and mindsets helpful in becoming a professional engineer. The course is divided into several short modules. Each module is devoted to a different topic and is taught by a different instructor. External speakers provide context for engineering practice. Taken second year or later.

ECEG 311. ECE Spring Seminar. .5 Credits.
Offered Spring Semester Only; Lecture hours:2
Seminar course focusing on the skills, knowledge, and mindsets helpful in becoming a professional engineer. The course is divided into several short modules. Each module is devoted to a different topic and is taught by a different instructor. External speakers provide context for engineering practice. Taken second year or later.

ECEG 341. Electrical & Computer Engineering Systems. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
This course explores the foundational concepts of electrical and computer engineering through the design and evaluation of embedded computing systems. Concepts explored will include basic electricity and circuits, digital logic, conversion of analog and digital signals, microcontroller programming and debugging, and sensor data analysis.

ECEG 350. Electronics I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to semiconductor components, device physics, and modeling. Applications and practical design considerations of circuits based on operational amplifiers, diodes, voltage regulators, transistors, and CMOS logic gates. Prerequisite: ECEG 210 or permission of the instructor.

ECEG 351. Electronics II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Fundamentals of p-n junctions, power electronics and sensors. The course’s emphasis is on the integration of electronics with sensors to design a system. Prerequisite: ECEG 350 or permission of the instructor.

ECEG 370. Probabilistic System & Data Analysis. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to the probabilistic description of signals, systems, and data. Topics include random variables/vectors/processes, statistical data characterization, expectations, information measures, and transformations of random data. The course includes a discussion of the foundations of detection, classification, and estimation theory. Prerequisite: ECEG 270.

ECEG 390. Theory and Applications of Electromagnetics. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
Applications of Maxwell's equations to the solution of problems involving electric and magnetic fields and transverse electromagnetic waves. Transmission line parameters, wave propagation, reflection from planar surfaces, polarization, and electromagnetic interaction with matter. Prerequisites: ECEG 210 and MATH 211.

ECEG 3NT. Electrical and Computer Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in electrical and computer engineering. Prerequisite: permission of the instructor.

ECEG 400. ECE Capstone Design I. 1 Credit.
Offered Fall Semester Only; Lecture hours:4,Lab:2
Engineering capstone design focusing on problem identification, project planning and logistics, and learning the divergent/convergent engineering design process in Electrical Computer Engineering. Year long capstone experience that concludes with ECEG 401. Prerequisite: ECEG 301 or permission of instructor.

ECEG 401. ECE Capstone Design II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
The continuation of ECEG 400 concludes the capstone sequence for electrical and computer engineering majors. Student teams develop, implement, and evaluate the value of their project for an external client. Prerequisite: ECEG 400 or permission of the instructor.

ECEG 402. Special Topics in Electrical or Computer Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2; Repeatable
Current topics of interest in electrical or computer engineering. This course includes a lab section. Crosslisted as ECEG 602.

ECEG 403. Special Topics in Electrical and Computer Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4; Repeatable
Current topics of interest in electrical and computer engineering. This course does not include a lab section. Crosslisted as ECEG 603.

ECEG 408. Advanced Independent Study. .25-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Advanced independent study for seniors. Prerequisite: permission of instructor.

ECEG 411. Neural Engineering. 1 Credit.
Offered Occasionally; Lecture hours:3,Recitation:1
Introduction to neural systems and engineering. Topics include neurophysiology, quantitative neural recording and stimulation models, neural signal acquisition and processing, clinical applications, and current field-wide challenges. Prerequisite: permission of the instructor. Crosslisted as BMEG 441 and ECEG 611.

ECEG 430. Mobile Computing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Mobile computing ecosystem including apps, devices, wireless networks, and back-end systems. Includes at least one major project; the specific course content will vary based on projects, student interest, and current technology trends. This course typically includes a considerable amount of software development. Prerequisite: CSCI 205 or permission of instructor. Crosslisted as CSCI 340 and ECEG 630.

ECEG 431. Computer Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
This course provides students the concepts, technologies, and skills needed for advanced study in computer engineering. It includes aspects of computer organization, computer architecture, operating systems, networking, and performance evaluation and the relationship between them. Prerequisite: CSCI 206, ECEG 247, or permission of the instructor.

ECEG 432. The Internet of Things. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A broad investigation into the design of internet-connected physical objects and the infrastructure that supports them. This hands-on course covers topics including embedded systems, wireless communication, internet protocols, cloud computing and security. Students will develop their own IoT system. Prerequisite: (CSCI 206 or CSCI 306) or ECEG 247. Crosslisted as CSCI 332 and ECEG 632.

ECEG 442. Digital VLSI Circuit Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Introduction to digital integrated circuit design, from wafer fabrication through structured design techniques. Teams conceptualize, design, simulate, layout, extract, and verify small VLSI systems using appropriate CAD tools. Prerequisites: ECEG 240 and ECEG 350 or permission of the instructor. Crosslisted as ECEG 642.

ECEG 443. Computer Architecture. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Explores two important topics in computer architecture today: memory hierarchy and parallelism in all its forms. Students will use a hardware description language to implement concepts including pipelining, cache and branch prediction. Prerequisite: CSCI 206 or CSCI 306 or ECEG 247 or permission of the instructor. Crosslisted as CSCI 320 and ECEG 643.

ECEG 444. Advanced Digital Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:2,Other:2
Design of multi-part digital systems using contemporary digital components centered around a system-on-chip with a microprocessor and FPGA. Hardware description languages, specialized FPGA elements, peripheral interfacing and protocols, high-level synthesis. Prerequisites: ECEG 240 or permission of the instructor. Crosslisted as ECEG 644.

ECEG 461. Electrical Energy Conversion. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Three phase power circuits, transmission and distribution systems, transformer circuits, substation equipment, rotating machines, motor generator systems and introduction to renewable power systems. Prerequisite: ECEG 350 or permission of the instructor.

ECEG 462. Renewable Energy Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Engineering analysis of photovoltaic, wind and other renewable energy systems. Modeling of systems, resources and performance with an emphasis on grid-tied photovoltaic system optimization. Open to juniors and seniors in engineering. Crosslisted as ECEG 662.

ECEG 470. Communication and Information Systems. 1 Credit.
Lecture hours:3,Other:1
Digital and analog communication systems, elements of information theory and contributions of Claude Shannon, signal space, modulation, and case studies of modern digital communication systems. Prerequisite: ECEG 270 or permission of the instructor. Crosslisted as ECEG 670.

ECEG 472. Digital Signals and Communications. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduction to digital signal processing and digital communications. Topics: sampling theorem, discrete time Fourier transform (DTFT), Fourier series, fast Fourier transform (FFT), z-transform, digital filters, applications in audio and image processing, modulation techniques for digital signals. Prerequisite: ECEG 270 or permission of instructor. Crosslisted as ECEG 672.

ECEG 473. Digital Speech and Audio Processing. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Theory and application of digital speech and audio processing. Topics vary, but may include audio filtering, audio coding, room acoustics, digital analysis of speech and music signals, basic concepts of electronic music, and audio effects. Prerequisite: ECEG 270 or permission of the instructor. Crosslisted as ECEG 673.

ECEG 474. Neural Signals and Systems. 1 Credit.
Offered Occasionally; Lecture hours:3
Introduction to neural systems and signaling. Topics include neural physiology, models of action potential generation and synapse dynamics, neural networks and techniques of neural waveform analysis. Prerequisite: permission of the Instructor. Crosslisted as BMEG 441.

ECEG 475. Computer Communication Networking. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to computer networking using the seven-layer Open Systems Interconnection model. Hands-on exploration of the data link, network, transport, and application layers. Prerequisite: Junior status.

ECEG 476. Electrical Control Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Analysis of linear systems in time and Laplace transform domains, closed-loop transfer function, stability criteria, control system design with root locus, implementation with Arduino microcontrollers. Prerequisite: ECEG 270.

ECEG 478. Machine Learning and Intelligent Systems. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Introduction to artificial intelligence (AI) and machine learning (ML) including fundamental principles and creation of software applications. The course covers both practical applications and the theoretical underpinnings of ML and AI technologies. MATH 211 and Python coding experience recommended. Prerequisite: MATH 202 or permission of instructor. Crosslisted as ECEG 678.

ECEG 479. Wireless Networks & Applications. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
This course explores the realm of modern wireless technologies and their practical applications, familiarizing students with the ever-evolving landscape of wireless networks. It equips students with a profound understanding of wireless communication principles, protocols and network architectures, covering fundamental concepts such as radio frequency fundamentals, as well as advanced topics. Crosslisted as CSCI 368 and ECEG 679.

ECEG 495. Advanced Topics in Engineering Mathematics. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Linear algebra and analytical computation techniques for solving ordinary and partial differential equations relevant to engineering applications. Prerequisite: permission of the instructor.Crosslisted as CEEG 495 and CHEG 495 and MECH 495 and ENGR 695.

ECEG 497. Wireless System Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Introduction to hardware aspects of wireless communication systems, including RF circuit design, transmitter and receiver architecture, antennas, and radio wave propagation. Prerequisite: ECEG 390 or concurrent enrollment or permission of the instructor. Crosslisted as ECEG 697.

Engineering

These courses include an engineering component and are relevant to more than one engineering discipline. An engineering component includes elements of engineering sciences, mathematics, exploration, historical or modern practice, or design.

Courses

ENGR 099. Engineering Seminar: Becoming a Bucknell Engineer. 0 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Other:1
A weekly seminar for all first-year engineering majors.

ENGR 100. Engineering Design Experience. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:2
Introduction to the study and practice of engineering through authentic design projects centered around a common theme. Project-based course focuses on the engineering design process, teamwork fundamentals, engineering ethics, and the development of both technical and professional skills. Permission of instructor required for non-first-year students.

ENGR 101. Engineering Graphics. .5 Credits.
Offered Spring Semester Only; Lecture hours:1,Lab:2
Introduction to engineering graphics including drawing with drafting instruments, computer-aided drafting and surveying.

ENGR 1NT. ENGR Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3
Non-traditional study in engineering. Prerequisite: permission of the instructor.

ENGR 211. Introduction to Chemical Engineering Computing. .5 Credits.
Offered Spring Semester Only; Lecture hours:2,Lab:1
Programming fundamentals and introductory numerical methods. Problems drawn from mathematics and chemical engineering. With computational laboratory. Corequisite: ENGR 211L. Prerequisite: MATH 201. Not open to students who have taken ENGR 212 or ENGR 214.

ENGR 212. Engineering Computation. .5 Credits.
Offered Fall Semester Only; Lecture hours:1,Lab:2
An in-depth introduction to using computers as a fundamental tool for solving civil engineering problems. Course will include: structured programming, and numerical methods. Prerequisite: MATH 222 or equivalent. Not open to students who have taken ENGR 211.

ENGR 214. Computational Analysis. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduction to a modern computer language. Structured programming and algorithm design for engineering problems involving linear algebra, statistical analysis of data, and elementary numerical analysis. Introduction and use of a scientific application package as a tool. Not open to students who have taken ENGR 211 or ENGR 212. Open to mechanical engineering students only.

ENGR 215. Experimental Design and Data Analysis. .5 Credits.
Offered Spring Semester Only; Lecture hours:2,Lab:1
Introduction to the analysis of experimental and industrial data. Topics include statistical inference, analysis of variance, regression analysis, experimental design and computational methods. With computational laboratory. Not open to students who have taken BMEG 226, ENGR 226, MATH 216 or MATH 226.

ENGR 222. Civil Engineering Fluid Mechanics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:3
Fluid properties and hydrostatics. Flow concepts and basic equations. Viscous flow in pipes and channels. Steady pipe flow. Potential flow. Introduction to open channels or hydraulic machinery. Prerequisite: ENGR 229.

ENGR 226. Probability and Statistics for Engineers. .5 Credits.
Offered Fall Semester Only; Lecture hours:1,Lab:2
Exploratory data analysis, probability theory, discrete and continuous random variables, point estimation, sampling distributions and methods of statistical inference. Prerequisites: MATH 202 and only open to civil or environmental engineering students.

ENGR 229. Solid Mechanics I. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
Equilibrium of rigid body systems, including analysis of trusses, beams, and frames for internal forces and moments. Introduction to stress and strain, including their relationship and stress transformations. Prerequisites: (PHYS 211 and MATH 201) or MATH 205, or permission of the instructor.

ENGR 233. Chemical Engineering Fluid Mechanics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Fluid statics, laminar and turbulent flow of incompressible fluids; introduction to compressible and non-Newtonian fluids; nature of forces, momentum transfer, shell balances; dimensional analysis; applications to pipe flow, drag, fluid measurement and pump design. With experimental laboratory. Corequisite: CHEG 210 or MATH 212.

ENGR 239. Solid Mechanics II. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Behavior of deformable systems: analysis for forces/stresses and deformation/strains due to axial, torsional, flexural, shear, and combined effects. Analysis of indeterminate systems and basic concepts of stability of compression members. Laboratory experiments to demonstrate mechanics principles. Prerequisite: ENGR 229.

ENGR 240. Science of Materials. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Study of the relationships between atomic structure and observable properties of materials. Properties of metallic, ceramic, and polymeric materials. Selection of materials for engineering applications. Measurement and modification of material properties. With experimental laboratory. Pre/Corequisite: one of the following: CHEM 203, CHEM 205, CHEM 207, or equivalent, or instructor permission.

ENGR 242. Materials Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3
Elements of science of civil engineering materials from a life-cycle perspective. Study of extraction, production, application, deterioration, repair, and end-of-life of wood, steel and concrete. Strategies for sustainable use of materials in civil engineering applications. Prerequisite: ENGR 229. Not open to students who have taken ENGR 240.

ENGR 245. Technical and Professional Communication for Engineers. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Survey of communication, including, but not limited to, oral and poster presentations, professional/business communication, and developing and conveying arguments, all of which are highly relevant to engineers pursuing academic, industrial, or other career paths.

ENGR 248. Engineering Problems. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:Varies; Repeatable
Problems in engineering adapted to the needs of the students. Prerequisite: permission of the instructor.

ENGR 249. Introduction to Data Analysis in Python. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:4
In this course, we will explore the use of Python for data analysis. Through lectures, programming labs and a final project, we will develop skills in both data handling and programming. No prior coding experience is required, but some exposure to programming language(s) (Matlab, R, C++, HTML, etc.) is recommended.

ENGR 250. Product Archeology: Unearthing Business Decisions. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2,Other:2
An examination of device design by unearthing the technical and business decisions made in bringing a real product to market. Topics will include product dissection, competitive analysis, intellectual property, financial forecasting, marketing, sales, distribution, industry standards, project planning, project management, and individual and team professionalism. Requires permission of the instructor.

ENGR 290. Engineering: Global/Societal Context. 1 Credit.
Offered Occasionally; Lecture hours:Varies; Repeatable
This study abroad course studies the global and societal context of engineering including impact of traditions, customs, and culture on engineering. A three-week study abroad course. Prerequisites: permission of the instructor.

ENGR 291. The Global Engineer. .25 Credits.
Offered Both Fall and Spring,Offered Occasionally; Lecture hours:1,Other:1; Repeatable
Engineering and cultural awareness are explored in a global and societal context. Students develop skills necessary to become successful global engineers, informed global citizens and environmental stewards. Students are encouraged to take this course more than once. If the course is repeated four times, students can petition the Associate Dean of Engineering for this course to fulfill the global and societal perspectives requirement. Prerequisite: engineering majors only. Arts and Sciences students by permission of the instructor.

ENGR 400. Engineering Research Design and Methods. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:1
Overview of common methods in engineering thesis research. Specific topics include literature searches and reviews, hypothesis driven research question formulation, research methodology development, and individual skill development. Upon completion of this course, students will have developed a plan for their thesis research and their professional development as undergraduate or graduate students. Crosslisted as ENGR 600.

ENGR 401. Engineering Research Communication. .25 Credits.
Offered Both Fall and Spring; Lecture hours:1; Repeatable
Overview of communication strategies for effective oral and poster presentations, written technical documents, and professional communication primarily targeted at activities related to thesis research. Crosslisted as ENGR 601.

ENGR 452. Interdisciplinary Senior Design I. .5 Credits.
Offered Fall Semester Only; Lecture hours:2,Other:2
Capstone design course emphasizing realization of engineered design solutions in interdisciplinary teams. Focus areas include problem definition, background research, solution generation, team skills, communication, and professional development. Emphasis placed on articulating, addressing, and validating customer-appropriate value proposition.

ENGR 453. Interdisciplinary Senior Design II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Second semester of the interdisciplinary engineering design sequence emphasizing fabrication, instrumentation, testing and evaluation, development and roll-out, and final presentation of projects.

Environmental Engineering

Faculty

Professors: Richard Crago (Chair), Douglas Gabauer, Matthew J. Higgins, Michael A. Malusis (Associate Dean for Faculty Development), Terri R. Norton (Associate Dean for Students & Strategic Initiatives), Brad Putman (Dean of the College of Engineering), Ronald D. Ziemian

Associate Professors: Michelle R. Beiler, Stephen G. Buonopane, Kevin Gilmore, Jessica Newlin, Kelly A. Salyards, Deborah L. Sills

Assistant Professors: Alomir H. Favero Neto, Carley Gwin (Teaching, Associate Chair), Nicholas Tymvios

Postdoctoral Fellow: Austin Wadle

Vision

Bucknell University's civil and environmental engineering programs prepare the next generation of leaders in the stewardship of our natural and built environment for the benefit of the planet, communities and people.

Mission

Bucknell University's civil and environmental engineering programs provide an excellent undergraduate education in a four-year curriculum. We deliver a student-centered educational experience with outstanding teaching, small class sizes, hands-on and experiential learning, and close classroom and research interaction with approachable faculty and staff. Our priorities include:

- creating an **inclusive and supportive community** in which all voices are valued and respected, diverse perspectives are embraced, and students, staff and faculty of all backgrounds and identities can thrive;
- providing the **breadth and depth of technical training** necessary for students to excel in professional positions and graduate programs;
- developing strong **critical thinking and communication skills**;
- instilling a mindset of **sustainability, equity, justice and ethical responsibility** to improve the lives of all people;
- integrating **perspectives from the arts, humanities, social sciences, management and engineering**, which are all uniquely provided at Bucknell, to address global and societal challenges; and
- inspiring **intellectual curiosity and the confidence to learn independently**.

Program Educational Objectives (PEOs)

The environmental engineering program seeks to prepare students to be successful professionals who excel in:

1. critical thinking, problem-solving, and communication skills
2. ability to work collaboratively and inclusively on diverse teams and within communities
3. practicality, creativity and adaptability to new situations
4. integration of equity, ethics, sustainability and the needs of underrepresented populations
5. professional development and intellectual growth

Student Outcomes

Graduates of the program are expected to demonstrate the following learning outcomes, which reflect ABET accreditation criteria:

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed using appropriate learning strategies.

The environmental engineering program at Bucknell University is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (https://www.abet.org/).

Bachelor of Science in Environmental Engineering

The Bachelor of Science in Environmental Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099	0	CEEG 242	1
ENGR 100	1	ENGR 101	.5
MATH 201	1	ENGR 229	1
PHYS 211	1	GEOL 250	1
Foundation Seminar (W1)	1	MATH 202	1
	4		**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
CEEG 340	1	CEEG 440	1
CHEM 203	1	ENGR 222	1
MATH 211	1	ENST 208	1
ENGR 226	.5	MATH 222	.5
Elective	1	Elective	1
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
CEEG 290	.5	Four Electives	4
CEEG 320	1	CEEG 390	0
CEEG 350	1		
CEEG 445	1		
ENGR 212	.5		
	4		**4**

Senior

First Semester	Credits	Second Semester	Credits
CEEG 441	1	CEEG 443	1
CEEG 492	1	CEEG 444	1
Two Electives	2	CEEG 493	.5
		Two Electives	2
	4		**4.5**

Total Credits: 34

The elective courses shown above are distributed as follows:

- A student must choose electives that meet engineering college requirements for general education and global perspectives (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/).
- Six unrestricted electives. These can be used to pursue additional interests or further develop expertise in a specific area.
- Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC), and two subsequent W2 courses.

Bachelor of Arts/Management for Engineers - Bachelor of Science in Environmental Engineering

The Bachelor of Arts/Management for Engineers - Bachelor of Science in Environmental Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099	0	CEEG 242	1
ENGR 100	1	ENGR 101	.5
MATH 201	1	ENGR 229	1

PHYS 211	1	GEOL 250	1
Foundation Seminar (W1)	1	MATH 202	1
	4		**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
CEEG 340	1	CEEG 440	1
CHEM 203	1	ENGR 222	1
MATH 211	1	ENST 208	1
ENGR 226	.5	MATH 222	.5
Elective	1	Elective	1
	4.5		**4.5**

Junior

First Semester	Credits	Second Semester	Credits
CEEG 290	.5	CEEG 390	0
CEEG 320 or 350	1	Four Electives	4
CEEG 445	1		
ENGR 212	.5		
Elective	1		
	4		**4**

Senior

First Semester	Credits	Second Semester	Credits
CEEG 320 or 350	1	CEEG 443	1
CEEG 441	1	CEEG 444	1
Two Electives	2	Two Electives	2
	4		**4**

Five Year

First Semester	Credits	Second Semester	Credits
CEEG 492	1	CEEG 493	.5
Three Electives	3	Four Electives	4
	4		**4.5**

Total Credits: 42

The elective courses shown above include:

- Courses used to fulfill the General Education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) requirements for engineering students should also fulfill the College of Arts & Sciences Core Curriculum (CASCC) (https://coursecatalog.bucknell.edu/collegeofartsandsciencescurricula/curriculaoverview/collegecorecurriculum/) requirements for those in the 5-year Engineering & Liberal Arts dual degree program or the Freeman College of Management General Education Curriculum (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/curriculaoverview/gened/) requirements for those in the 5-year Engineering & Management dual degree program.
- Three courses in each student's program must fulfill the University writing requirement that includes a W1 course taken in the first semester, foundation seminar (FOUN or RESC), and two subsequent W2 courses.
- Eight courses selected to satisfy the major requirements for the Bachelor of Arts/Management for Engineers major.

Graduates of the program are expected to demonstrate the following learning outcomes, which reflect ABET accreditation criteria.

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Courses

CEEG 242. Sustainability Principles for Engineers. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
An introduction to concepts for the application of sustainable engineering principles. Topics include sustainability concepts and definitions, life-cycle assessment, engineering and ecological economics, biogeochemical cycles, embedded resources, climate science, indicators of social sustainability, and systems thinking. Preference given to First and Second Year Civil Environmental Engineering Students.

CEEG 280. Special Topics in Civil and Environmental Engineering. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies
Individual projects in laboratory work, design, or library studies, depending upon the nature of the problem selected. Prerequisite: permission of the instructor.

CEEG 290. Engineering Economics & Project Management. .5 Credits.
Offered Fall Semester Only; Lecture hours:1,Lab:2
Fundamental topics underlining civil and environmental engineering design and management over the project life cycle, including engineering economy, sustainable design, project management and leadership, engineering ethics and the importance of professional licensure. Prerequisites: open to civil or environmental engineering majors. All others by permission of the instructor.

CEEG 2NT. Civil and Environmental Non-traditional Study. .25-4 Credits.
Offered Occasionally; Lecture hours:Varies
Non-traditional study in civil and environmental engineering.

CEEG 300. Introduction to Structural Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Introduction to behavior, analysis and design of structures; including design criteria, loads, modeling of structural systems, design with various material types (e.g. steel, concrete, timber, masonry). Discussion of the design process, and societal/global context of structural design. Case studies used throughout the course. Prerequisite: ENGR 239.

CEEG 320. Water Resources Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Planning, design, and operation of water resources projects with emphasis on hydrology, hydraulic structures, and open and closed conduits; applications in stormwater management and water supply. Prerequisite: ENGR 222.

CEEG 330. Introduction to Transportation. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Transportation systems, operations, planning, and design for highways and other modes; sustainability, safety, social, and economic issues; traffic studies in the local community.

CEEG 340. Environmental Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Introduction to fundamentals of environmental engineering and science including chemistry, microbiology, mass balance and reactor theory. Application of concepts to environmental engineering includes water quality, water and waste-water treatment, solid and hazardous waste, air pollution, greenhouse gases and climate change. Includes hands-on lab.

CEEG 350. Geotechnical Engineering I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Origin, composition, structure, and properties of soils. Identification, classification, strength, permeability, and compressibility characteristics. Introduction to foundation engineering. Laboratory determination of soil properties. Prerequisites: ENGR 222 and ENGR 229 or permission of the instructor.

CEEG 380. Special Topics in Civil and Environmental Engineering. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies
Individual projects in laboratory work, design, or library studies, depending upon the nature of the problem selected. Prerequisite: permission of the instructor.

CEEG 390. Civil & Environmental Engineering Seminar. 0 Credits.
Offered Spring Semester Only; Lecture hours:2; Repeatable
A weekly seminar for all civil and environmental engineering majors. Presentations by practicing engineers and others covering multiple sub-disciplines of civil and environmental engineering, professional practice, ethics, global issues, engineering careers and other relevant topics.

CEEG 3NT. Civil and Environmental Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies
Non-traditional study in civil and environmental engineering. Prerequisite: permission of the instructor.

CEEG 401. Structural Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Analysis of structures including: review of essential mechanics; sketching deflection, moment, and force diagrams for indeterminate systems; influence lines; application of virtual force and displacement principles; and a comprehensive study of the direct stiffness method with a focus on matrix analysis. Prerequisites: CEEG 300 or permission of the instructor.

CEEG 403. Wood Engineering Design Principles. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Wood properties as construction material; design of beams, columns, fasteners, and connections. Glued-laminated timber and many other uses for structures in accordance with the National Design Specifications. Form work for concrete structures, plywood and plywood diaphragms. Prerequisite: CEEG 300 or permission of the instructor.

CEEG 405. Design of Steel Structures. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Introduction to behavior and design of steel structures and elements, including tension members, compression members, beams, beam-columns and connections. Limit states design philosophy is emphasized through the use of AISC specifications. Design loads according to contemporary standards, and international building codes.

CEEG 406. Design of Concrete Structures. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Introduction to behavior and design of concrete elements and structures: beams, columns, slabs, footings, bridges. Reinforced and prestressed concrete. Material properties and behavior, flexural and shear strength, serviceability and deflections. Use of relevant codes and specifications including ACI and AASHTO. Design loads according to contemporary standards and international building codes.

CEEG 407. Prestressed Concrete. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Analysis and design of prestressed concrete members and structures: flexural stresses, flexural strength, shear strength, loss of prestress, deflections. Prerequisites: CEEG 406 and permission of the instructor.

CEEG 408. Finite Element Methods. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:2
Fundamental theory and applications for civil and mechanical engineering. Multidimensional elements, and axisymmetric elements, and their formulations; stress recovery techniques; modeling considerations; convergence criteria and error estimates, includes use of commercial and developmental finite element analysis programs. Prerequisites: CEEG 300 or permission of the instructor. Crosslisted as CEEG 608 and MECH 467 and MECH 667.

CEEG 419. Advanced Topics in Structural Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Topics will vary. Prerequisite: permission of the instructor.

CEEG 421. Hydrology. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
The interrelation of meteorological conditions, precipitation, surface runoff, and groundwater storage. Prerequisites: CEEG 320 and permission of the instructor.

CEEG 422. River Mechanics. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Mechanics of free-surface flows in rivers; introduction to sediment transport mechanisms; application to river engineering design (bridge crossings, culverts, flood control, river stabilization). Prerequisites: ENGR 222 and permission of the instructor.

CEEG 425. Groundwater. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:2
The study of the occurrence of groundwater, the laws and equations governing storage and movement of groundwater, and the interaction between surface and ground waters. Prerequisite: permission of the instructor.

CEEG 429. Advanced Topics in Water Resources Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Topics will vary. Prerequisite: permission of the instructor.

CEEG 430. Introduction to Roadside Safety. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Fundamentals of roadside safety design and analysis: topics include traffic barrier warranting and selection, crash data analysis, hardware performance evaluation, and benefit/cost analysis. Prerequisite: CEEG 330 or permission of the instructor. Crosslisted as CEEG 630.

CEEG 431. Introduction to Urban and Regional Planning. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Problems of urban and regional planning and the treatment of various factors of a comprehensive plan. Emphasis on the sustainability and the interrelationships between engineering, sociology, geography, and economics. Prerequisite: permission of the instructor.

CEEG 432. Sustainable Transportation Planning. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Application of multimodal design principles, urban and regional planning approaches, and innovative transportation technologies associated with smart cities. Planning and design of transportation systems in order to enhance mobility while simultaneously reducing impacts on the environment, society, and the economy. Prerequisite: CEEG 330 or permission of the instructor.

CEEG 436. Advanced Traffic Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Introduction to traffic engineering elements, including traffic flow theory, queue theory, geometric design and signal design. Students will learn to use traffic design and simulation software. Prerequisite: CEEG 330 or permission of the instructor.

CEEG 439. Advanced Topics in Transportation. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:4
Topics will vary. Prerequisite: permission of the instructor.

CEEG 440. Unit Operations and Processes in Environmental Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Fundamentals of unit operations and processes used to remove pollutants from water, air, and soil such as coagulation, sedimentation, filtration, disinfection, adsorption, membrane separation, and biological transformations. Laboratory experiments reinforce theory and inform system design and evaluation. Prerequisites: CEEG 340 and open to Environmental Engineering majors. All others may waitlist. Crosslisted as CEEG 640.

CEEG 441. Environmental Engineering Biotechnology. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:2
Theory and design of biological waste treatment systems for industrial, municipal and hazardous pollutants and natural biotransformation of pollutants in the environment. Laboratory experience on startup, operation, and analysis of systems that biodegrade pollutants and produce useful forms of energy. Prerequisite: CEEG 340 or instructor permission. Crosslisted as CEEG 641.

CEEG 443. Sustainable Design. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Students will learn principles of quantitative sustainable design for environmental systems, such as bio-based chemical production. They will apply technoeconomic analysis (TEA) and environmental life cycle assessment (LCA) to engineering design under uncertainty. Reading, discussion, and computational tools are central to the course. Crosslisted as CEEG 643.

CEEG 444. Hazardous Waste Management. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Identification of common hazardous chemicals and related industrial activities, determination of risk-based clean up levels for hazardous waste sites, toxicology, pump-and-treat ground water remediation, in situ bioremediation, legal and liability issues, and remedial action. Prerequisites: CEEG 340 and open to Environmental Engineering majors. All others may waitlist. Crosslisted as CEEG 644.

CEEG 445. Environmental Engineering Chemistry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Principles of aquatic chemistry and applications with emphasis on acid-base reactions, metal speciation and solubility, and oxidation-reduction reactions in water. Prerequisite: CEEG 340 or permission of the instructor.

CEEG 447. Sustainable Cities. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:2
This team taught course introduces students to the core concepts of sustainability and how they have been applied to promote sustainability in London, the UK, and Europe. This course is part of Bucknell in London core course. Prerequisite: permission of the instructor. Crosslisted as ENST 347.

CEEG 448. Air Quality / Hazardous Waste Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Air quality topics: regulations, airborne pollutants and sources, treatment technology design, and air quality/climate change relationship. Hazardous waste topics: identification of hazardous chemicals and sources, risk-based clean-up of contaminated sites, toxicology, pump-and-treat remediation, in situ bioremediation, legal and liability issues, and remedial action. Prerequisite: CEEG 340 or instructor permission. Crosslisted as CEEG 648.

CEEG 449. Advanced Topics in Environmental Engineering. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Advanced topics course for Civil and Environmental Engineering. Prerequisite: permission of the instructor.

CEEG 450. Geotechnical Engineering II. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Application of the theories and principles of soil mechanics to foundation design. Subsurface investigations; methods of analysis, design, and construction of foundations; bearing capacity and settlement of shallow and deep foundations; excavation and bracing; earth structures. Prerequisite: CEEG 350 or permission of the instructor.

CEEG 451. Environmental Geotechnology. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Interaction between hazardous and toxic wastes and geotechnical properties of soils. Remediation of the subsurface environment. Prerequisite: CEEG 350 or permission of the instructor.

CEEG 452. Ground Improvement Engineering. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:2
Application of soil mechanics principles to improving the engineering characteristics of soils. Includes mechanisms of soil stabilization, grouting, deep dynamic compaction, reinforced earth, sand drains, and preconsolidation. Prerequisites: CEEG 350 and permission of the instructor.

CEEG 453. Advanced Soil Mechanics. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:3
Advanced study of the theories of strength, hydraulic conductivity and compressibility. Critical review of soil origin and composition effects upon the physical and engineering properties of soils. Introduction to soil dynamics. Planning, execution, and interpretation of soil testing programs. Prerequisites: CEEG 350 and permission of the instructor.

CEEG 459. Advanced Topics in Geotechnical Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Topics will vary. Prerequisite: permission of the instructor.

CEEG 472. Construction Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Building methods and design of temporary structures such as formwork, sheet piles, soldier piles, scaffolding, etc. Calculation and optimization of earth moving operations, heavy civil construction management methods, and equipment selection. Prerequisite: ENGR 229. Crosslisted as CEEG 672.

CEEG 474. Safety and Risk Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Lab:2
Specific topics for this course will include: causes and prevention of Architecture-Engineering- Construction (AEC) Industry Incidents, OSHA regulations and requirements, design of accident prevention programs and the identification-analysis-response and management of AEC industry related risks. Prerequisite: CEEG 290. Crosslisted as CEEG 674.

CEEG 475. Forensic Engineering. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Introduction to identification, evaluation and analysis of a wide variety of engineering failures; failure investigation and the legal process; serviceability failure, material or system failure, design errors; expert witness testimony. Prerequisite: senior status.

CEEG 479. Advanced Topics in Construction Engineering and Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:2
Topics will vary. Prerequisite: permission of the instructor.

CEEG 480. Special Topics in Civil and Environmental Engineering. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Individual projects in laboratory work, design, or library studies, depending upon the nature of the problem selected. Prerequisite: permission of the instructor.

CEEG 481. Undergraduate Research. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:Varies; Repeatable
Original investigations in structural engineering, transportation engineering, environmental engineering, geotechnical engineering, or water resource engineering.

CEEG 492. Civil and Environmental Engineering Planning and Design I. 1 Credit.
Offered Fall Semester Only; Lecture hours:1,Lab:2
Planning process including feasibility study. Professional practice issues. Initial design of a project that integrates at least two subdisciplines of civil and environmental engineering. Projects are designed by teams and must involve analysis and synthesis to produce design solutions that achieve the desired "client" needs within specified constraints.

CEEG 493. Civil and Environmental Engineering Design II. .5 Credits.
Offered Spring Semester Only; Lecture hours:Varies,Other:2.5
Final, comprehensive design of a project that integrates at least two subdisciplines of civil and environmental engineering. Projects are designed by teams and must involve analysis and synthesis to produce design solutions that achieve the desired "client" needs within specified constraints. Prerequisite: CEEG 492.

CEEG 495. Advanced Topics in Engineering Mathematics. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Linear algebra and analytical/computational techniques for solving ordinary and partial differential equations relevant to engineering applications. Prerequisite: permission of the instructor. Crosslisted as CHEG 495 and ECEG 495 and MECH 495 and ENGR 695.

CEEG 4NT. Civil and Environmental Engineering Non-traditional Study. .25-4 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies; Repeatable
Non-traditional study in civil and environmental engineering. Prerequisite: permission of the instructor.

Mechanical Engineering

Faculty

Professors: Indranil Brahma, Charles J. Kim, Nathan P. Siegel, Wendelin J. Wright (Chair), Constance W. Ziemian

Associate Professors: Craig E. Beal, M. Laura Beninati, Benjamin Wheatley

Assistant Professors: James Arthur, Margo Donlin, Lily Li, Elizabeth Mamros, Greg O'Neill, Anurag Roy, William Scott, Andrew R. Sloboda, Jonathan Torres

Visiting Assistant Professor: Sarah Manoogian Gabauer

The discipline of mechanical engineering is the branch of engineering that deals predominantly with the conversion, transmission and storage of mechanical and thermal energy; the generation, transmission and control of forces; the production and regulation of mechanical motion; and the optimal use of materials in the design and fabrication of the requisite machines and mechanisms.

Mission Statement

The Department of Mechanical Engineering is committed to providing the best undergraduate mechanical engineering education possible within the constraints of a four-year curriculum. In accord with the College of Engineering Mission Statement, the mechanical engineering department strives to nurture the intellectual, professional and personal development of its students. The mechanism for achieving the department's educational mission is the curriculum in mechanical engineering designed to satisfy its Program Educational Objectives. The department strives to achieve a process of continuous improvement of the curricula, to provide a faculty who are professionally current in their field and to maintain state-of-the-art facilities.

Program Educational Objectives

The Department of Mechanical Engineering seeks to prepare students to be successful in engineering or other careers and to be recognized for qualities associated with their Bucknell educational experiences. Graduates of our program will:

- Develop innovative solutions to challenging problems consistent with professional expectations.
- Pursue advanced studies that supplement their Bucknell education and further their career.
- Demonstrate effective communication and an ability to contribute successfully to a multidisciplinary team.
- Make decisions by considering multiple factors including ethics, sustainability and societal impact.
- Advance professionally by accepting new responsibilities and demonstrating leadership potential.

It is our expectation that our graduates will have demonstrated significant progress toward a subset of these objectives within five years of graduation from Bucknell.

Student Outcomes

Graduates of the program shall demonstrate the following at the time of graduation:

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed using appropriate learning strategies.

The mechanical engineering program at Bucknell University is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (https://www.abet.org/).

Bachelor of Science in Mechanical Engineering

The **Bachelor of Science** in Mechanical Engineering requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099	0	ENGR 214	1
ENGR 100	1	MATH 202	1
MATH 201	1	MECH 202	.5
PHYS 211	1	MECH 220	1
Foundation Seminar (W1)	1	Elective	1
	4		**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
CHEM 203[1]	1	ENGR 240	1
MATH 211	1	MATH 212[3]	1
MECH 213	1	MATH 227	1
MECH 353 or 252[2]	1	MECH 252 or 353[2]	1
	4		**4**

Junior

First Semester	Credits	Second Semester	Credits
ECEG 205	1	MECH 222	.5
MECH 313	1	MECH 312	1
MECH 355	1	MECH 392[4]	1
Elective	1	Two electives	2
	4		**4.5**

Senior

First Semester	Credits	Second Semester	Credits
MECH 401	1	MECH 402	.5
MECH 403	1	Four electives	4
MECH 405	1		
Elective	1		
Elective	.5		
	4.5		**4.5**

Total Credits: 34

1 CHEM 203 General Chemistry for Engineers must be taken within the first two years.

2 Simultaneous enrollment in both MECH 353 Solid Mechanics and MECH 252 Dynamics is only permitted by the department chair.

3 MATH 212 Differential Equations and its prerequisite courses must be completed prior to the start of the junior year.

4 MECH 392 Mechanical Design must be completed before the start of senior year.

The 10.5 elective courses shown above are distributed as follows:

- A student must choose five electives that meet engineering college requirements for general education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/). Note that this includes the foundation seminar taken in the first semester.
- At a minimum, one course must also fulfill the college's global perspectives requirement. It is expected that this course is one of the five electives noted previously.
- One full-credit science or math elective selected from any of the following:
  - any full-credit, 200-level or 300-level courses in physics, astronomy, biology, chemistry or geology for which prerequisites have been satisfied;
  - any of the following 100-level geology courses (must be taken within the first three years):GEOL 108 When Rocks Attack, GEOL 109 Energy and Natural Resources, GEOL 117 Environmental Geohazards;
  - MATH 245 Linear Algebra, MATH 280 Logic, Sets, and Proofs, or any 300-level MATH course for which prerequisites have been satisfied;
- 2.5 credits of 400-level MECH elective courses. Up to 1.0 credit may be replaced with a) a course needed to fulfill a minor if the minor is otherwise not possible without an overload in the senior year, or b) an approved 400-level course in any department within the College of Engineering, for which the prerequisites have been met. The 400-level MECH elective courses may also count toward other University majors and minors.
- Two courses in any department or program of the University.

Three courses in each student's program must fulfill the University's writing requirement that includes a W1 (FOUN or RESC) course taken in the first semester of the first year and two subsequent W2 courses.

Bachelor of Arts/Management for Engineers - Bachelor of Science in Mechanical Engineering

The **Bachelor of Arts/Management for Engineers - Bachelor of Science in Mechanical Engineering** requirements are:

First Year

First Semester	Credits	Second Semester	Credits
ENGR 099	0	ENGR 214	1
ENGR 100	1	MATH 202	1
MATH 201	1	MECH 202	.5
PHYS 211	1	MECH 220	1
Foundation Seminar (W1)	1	Elective	1
	4		**4.5**

Sophomore

First Semester	Credits	Second Semester	Credits
CHEM 203[1]	1	MATH 212[2]	1
MATH 211	1	MATH 227	1
MECH 213	1	MECH 353 or 252[3]	1
Elective	1	Elective (UNIV 200)	1
	4		**4**

Junior

First Semester	Credits	Second Semester	Credits
ECEG 205[5]	1	ENGR 240	1
MECH 252 or 353[3]	1	MECH 222[5]	.5
Two Electives	2	MECH 392[4]	1
		Two electives	2
	4		**4.5**

Senior

First Semester	Credits	Second Semester	Credits
MECH 313	1	MECH 312	1
MECH 355	1	Three electives	3
Two electives	2		
	4		**4**

Five Year

First Semester	Credits	Second Semester	Credits
MECH 401	1	MECH 402	.5
MECH 403	1	Four Electives	4
MECH 405	1		
Elective	1		
Elective	.5		
	4.5		**4.5**

Total Credits: 42

1. CHEM 203 General Chemistry for Engineers must be taken before or concurrently with ENGR 240 Science of Materials, and is to be completed before the start of the fourth year (before semester 7).
2. MATH 212 Differential Equations and its prerequisite courses must be completed prior to the start of the junior year.
3. Simultaneous enrollment in both MECH 353 Solid Mechanics and MECH 252 Dynamics is only permitted by the department chair.
4. MECH 392 Mechanical Design must be completed before the start of the fifth year.
5. These courses may be delayed by one year, based on consultation with the academic adviser, if needed to complete the degree and if possible with regard to prerequisite courses.

The 18.5 elective courses shown above are distributed as follows:

- One full-credit science or math elective selected from any of the following:
  - Any full-credit, 200-level or 300-level courses in physics, astronomy, biology, chemistry or geology for which prerequisites have been satisfied;
  - Any of the following 100-level geology courses (must be taken within the first three years):GEOL 108 When Rocks Attack, GEOL 109 Energy and Natural Resources, GEOL 117 Environmental Geohazards;
  - MATH 245 Linear Algebra, MATH 280 Logic, Sets, and Proofs or any 300-level MATH course for which prerequisites have been satisfied;
- Eight courses to satisfy requirements for the Bachelor of Arts (BA) or Bachelor of Management for Engineers (BME) major.
- Courses used to fulfill the General Education (https://coursecatalog.bucknell.edu/collegeofengineeringcurricula/curriculaoverview/) requirements for engineering students should also fulfill the College of Arts & Sciences Core Curriculum (CASCC) (https://coursecatalog.bucknell.edu/collegeofartsandsciencescurricula/curriculaoverview/collegecorecurriculum/) requirements for those in the 5-year Engineering & Liberal Arts dual degree program or the Freeman College of Management General Education Curriculum (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/curriculaoverview/gened/) requirements for those in the 5-year Engineering & Management dual degree program.
- One Integrated Perspectives course (UNIV 200).
- One foreign language course.
- 2.5 credits of 400-level MECH elective courses. Up to 1.0 credit of these courses may be replaced with a) a course needed to fulfill a minor if the minor is otherwise not possible without an overload in the senior year, or b) an approved 400-level course in any department within the College of Engineering, for which the prerequisites have been met.
- Three courses in each student's program must fulfill the University's writing requirement that includes a W1 (FOUN or RESC) course taken in the first semester of the first year and two subsequent W2 courses.
- Two elective or required courses must also fulfill the Diversity in the U.S., Environmental Connections, and Global Connections components of the College Core Curriculum or Management General Education Curriculum.
- See the following link for the Freeman College of Management curricular information: https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/areasofstudy/bme (https://coursecatalog.bucknell.edu/collegeofmanagementcurricula/areasofstudy/bme/)

Graduates of the program shall demonstrate the following student outcomes at the time of graduation:

1. An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Courses

MECH 151. Machining for Manufacturing Technology. 0 Credits.
Offered Fall Semester Only; Lecture hours:1,Other:2
Develop an understanding of the processes needed to produce manufactured parts. Emphasis on hands-on machining and fabrication.

MECH 202. Graphics for Design and Manufacture. .5 Credits.
Offered Spring Semester Only; Lecture hours:1,Lab:2
Graphical representation techniques for visualization and communication of mechanical engineering designs and concepts. Creation, storage, and manipulation of production drawings and 3-D geometric representations using state-of-the-art software. Introduction to fabrication through rapid prototyping tools. Co-Requisite: MECH 202L.

MECH 213. Thermodynamics. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Thermodynamic principles including properties of substances, the first and second laws of thermodynamics, efficiencies, power and refrigeration cycles. Prerequisites: MATH 201 and ENGR 214 or permission of the department. Not open to students who have taken ENGR 200 or CHEG 310.

MECH 220. Mechanics. 1 Credit.
Offered Spring Semester Only; Lecture hours:4
Equilibrium of two-and three-dimensional rigid bodies and systems. Trusses, frames, and machines. Friction. Distributed forces and equivalent systems. Internal loads. Prerequisite: PHYS 211 and MATH 201 or permission of the instructor. Not open to students who have taken ENGR 221 or ENGR 229.

MECH 222. Introduction to Mechanical Engineering Lab Practice. .5 Credits.
Offered Spring Semester Only; Lecture hours:1,Lab:2
Sensors, measurement techniques for static and dynamic measurements, data processing, statistical data analysis, propagation of error, actuators and motors. Corequisite: MECH 222L. Prerequisites: MATH 202, ECEG 205, and ENGR 214.

MECH 230. Aircraft Design Competition. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:2; Repeatable
The AIAA Design/Build/Fly (DBF) competition tasks teams each year to design, build and then fly an aircraft that performs certain missions such as flying the fastest around a preset course. Through this competition, teams will learn how to design, engineer, manufacture and operate an aircraft.

MECH 231. Off-road Racing Design. .25 Credits.
Offered Both Fall and Spring; Lecture hours:Varies,Other:2; Repeatable
The SAE Baja Competition challenges teams to design, build, and compete with an off-road vehicle that will be tested in events that stress various aspects of vehicle performance, concluding with a four-hour endurance race. Teams also build a business case and present their engineering design to a panel of judges.

MECH 252. Dynamics. 1 Credit.
Offered Both Fall and Spring; Lecture hours:4
Kinematic and kinetic analysis of rigid bodies in planar motion. Absolute and relative analysis of displacements, velocities, and accelerations; force, energy, and momentum methods; analysis of mechanical vibrations; analytical and computer-simulated solution techniques. Prerequisites: MECH 220 and MATH 202 or permission of the instructor.

MECH 285. Independent Study for Sophomores. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4; Repeatable
Independent investigation under the direction of a faculty member for students who have completed their first year. Sophomore standing in mechanical engineering and permission of the instructor.

MECH 288. Intro topics in Mechanical Engineering. .5-1 Credits.
Offered Fall Semester Only; Lecture hours:2; Repeatable
Topic is specific to the semester offered. Course description will be available in Banner prior to registration.

MECH 302. Finite Elements in Analysis and Design. 1 Credit.
Offered Occasionally; Lecture hours:3,Lab:2
Introduction to finite element method (FEM) and commercial FEM software for design and analysis of mechanical components and thermal problems. Applications in mechanical and thermal component/system design. Co-Requisites: MECH 302L. Prerequisites: MECH 202 and MECH 353.

MECH 312. Heat Transfer. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Principles and engineering applications of heat transfer by conduction, convection, and radiation. Co-Requisites: MECH 312L. Prerequisite: MECH 313 or permission of the instructor.

MECH 313. Fluid Dynamics. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Fundamentals of fluid dynamics including integral and differential control volume analysis, conservation equations, dimensional analysis, incompressible inviscid flows, internal and external viscous flows. Prerequisites: MATH 212, MECH 213, or permission of the department. Not open to students who have taken ENGR 222 or ENGR 233.

MECH 353. Solid Mechanics. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Lab:2
Analysis of stress, strain, and failure of engineering components under axial, torsional, flexural, and combined loading conditions. Introduction to stability of compression members, energy methods, and failure theory. Bridge to computational methods in solid mechanics. Prerequisites: MECH 220 and MATH 202 or permission of the instructor.

MECH 355. Manufacturing Processes. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Analytical and technological study of materials processing including deformation, solidification, material removal, plastics forming, and additive manufacturing methods. Laboratory fabrication projects and introduction to numerical control and CAD/CAM. Co-Requisite: MECH 355L. Prerequisites: ENGR 240 and MECH 202, or permission of instructor.

MECH 385. Independent Study for Juniors. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4; Repeatable
Independent investigation under the direction of a faculty member for students who have completed two years of study. Junior standing in mechanical engineering and permission of the instructor.

MECH 392. Mechanical Design. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:2
Principles and techniques for creative design of machines in relation to specifications and user requirements. Design using a solid modeling CAD package. Co-Requisites: MECH 392L. Prerequisites: MECH 252 and MECH 353, or permission of the instructor.

MECH 401. Senior Design I. 1 Credit.
Offered Fall Semester Only; Lecture hours:2,Common Hour:2
Student teams design systems to solve open-ended problems with consideration of broad perspectives through the use of the design process, modeling and analysis, resource management, and documentation. Co-Requisite: MECH 401C. Prerequisites: MECH 312 and MECH 392, or permission of the instructor.

MECH 402. Senior Design II. .5 Credits.
Offered Spring Semester Only; Lecture hours:2,Common Hour:2
Student teams validate systems designed in MECH 401 with consideration of broad perspectives through modeling and analysis, fabrication, instrumentation, and testing. Professional practice in engineering and ethics. Design of experiments for design validation. Co-requisite: MECH 402C. Prerequisite: MECH 401.

MECH 403. Thermal Design. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Design of thermal-fluid energy conversion systems; equipment selection; codes and standards; and economic analysis. Mini-design laboratories and design projects. Co-Requisites: MECH 403L. Prerequisites: MECH 312.

MECH 405. System Dynamics. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:2
Modeling and analysis of dynamic systems consisting of mechanical, electrical, and fluid elements. Frequency response methods. Sampled data systems. Experimental system identification. Co-Requisites: MECH 405L. Prerequisites: MATH 212, MECH 222, MECH 252, and ECEG 205.

MECH 420. Solar Energy Conversion. 1 Credit.
Offered Occasionally; Lecture hours:4
Fundamental aspects of the design and operation of solar energy conversion systems including photovoltaics, solar thermal power, solar heating and chemical fuel production. Prerequisite: MECH 312 or permission of the instructor. Crosslisted as MECH 620.

MECH 422. Renewable Energy Conversion. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Current energy demands, environmental effects, renewable energy resources, includes solar, wind, tidal, ocean thermal, wave energies; clean coal, nuclear energy, smart grid technology. Prerequisites: CHEG 200 or ENGR 200 or MECH 213 or permission of instructor. Crosslisted as MECH 622.

MECH 424. Internal Combustion Engines. 1 Credit.
Offered Occasionally; Lecture hours:4
Description of internal combustion engines, methods of evaluating performance, the thermodynamics of combustion, engine testing, and design. Prerequisite: MECH 312 or permission of instructor. Crosslisted as MECH 624.

MECH 428. HVAC System & Smart Building. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Explores the key mechanical aspects in designing an efficient, intelligent, and healthy built environment. Topics include building energy load estimate, psychrometric analysis, typical cooling and heating production (steam, chilled water, air conditioning), air distribution systems and smart buildings in the context of grid decarbonization. Prerequisites: MECH 312, concurrency allowed. Crosslisted as MECH 628.

MECH 429. Applied Thermodynamics. 1 Credit.
Offered Occasionally; Lecture hours:4
Application of Thermodynamic principles for Energy, Refrigeration and Air-Conditioning, Psychrometrics, Combustion, Compressible Flow, Exergy Analysis. Prerequisite: MECH 213 or equivalent Crosslisted as MECH 629.

MECH 433. Advanced Fluid Mechanics. 1 Credit.
Offered Occasionally; Lecture hours:4
Kinematics of fluid flow. Conservation equations. Viscous flow. Turbulent flow (description, statistics, equations, physics, modeling, boundary layers, analyses). Selected applied topic(s) e.g. design applications of computational fluid dynamics, reservoir flow. Selected laboratory projects. Prerequisite: MECH 313 or equivalent, or permission of the instructor. Crosslisted as MECH 633.

MECH 435. Aerodynamics. 1 Credit.
Offered Occasionally; Lecture hours:4
Two-dimensional flow theory; vortex and momentum theories of finite wings; viscous flows, boundary layers and drag; high lift devices. Prerequisites: MECH 313 or equivalent and permission of the instructor. Crosslisted as MECH 635.

MECH 438. Fundamentals of Aircraft Dsgn. 1 Credit.
Offered Occasionally; Lecture hours:4
Introduction to aircraft design elements and theory. Develop computer models to design, analyze, simulate, and evaluate commercial and electric aircraft designs and their performance. Design, build, and fly a small-scale aircraft. Prerequisites: ENGR 214 and MECH 202. Crosslisted as MECH 638.

MECH 448. Advanced Materials Science. 1 Credit.
Offered Occasionally; Lecture hours:4
The course will start with a survey of different materials - metals and alloys, ceramics, polymers, composites, carbon, and biomaterials. Next, thin-film deposition methods and their characterization (microscopy and spectroscopy) will be discussed. Finally, the course will delve into tribology: the science of wear, friction, and lubrication. Prerequisite: ENGR 240. Crosslisted as MECH 648.

MECH 451. Vibration Analysis. .5-1 Credits.
Offered Occasionally; Lecture hours:4
Damped and undamped vibrations in free and forced systems. Resonance conditions. Vibration measuring equipment. Multi-degree of freedom discrete systems. Continuous systems. Prerequisites: MECH 252 or MATH 212 or permission of the instructor. Crosslisted as MECH 651.

MECH 453. Robotics. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
History, evolution, capabilities, and applications of robotic devices. Introduction to robot kinematics, dynamics, and control via mathematical and computational modeling approaches. Research into current topics in robotics. Prerequisites: MECH 252 or permission of the instructor. Crosslisted as MECH 653.

MECH 454. Vehicle Dynamics and Control. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Introduction to modeling of vehicles for analysis and control. Topics include tire models, handling response, stability control, suspension design, race tuning. Prerequisites: MECH 252 and MECH 353 and MECH 405 or permission of the instructor. Crosslisted as MECH 654.

MECH 457. Accident Analysis. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Analysis of vehicle design and performance as it pertains to crashworthiness. Vehicle materials and structure, how vehicles are regulated with an emphasis on occupant safety. Studying the evolution of modern designs to minimize injuries includes reviewing many relevant biomechanics research studies. Crosslisted as BMEG 457 and MECH 657.

MECH 460. Engineering Optimization. 1 Credit.
Offered Occasionally; Lecture hours:4
Mathematical representation and modeling of engineering decision-making problems. Applied methods of linear, nonlinear, discrete and global optimization. Numerical techniques for solving constrained and unconstrained problems. Prerequisites: ENGR 214, MATH 212, and MATH 245 or permission of the instructor. Crosslisted as MECH 660.

MECH 462. Computer Integrated Manufacturing. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Issues of integrated information and advanced machinery in modern manufacturing systems. In-depth study of solid modeling. Study of the effects of the integration of computers in manufacturing, via topics such as control of manufacturing processes, quality control, process planning, assembly, additive manufacturing, etc. Prerequisite: MECH 355 or permission of instructor. Crosslisted as MECH 662.

MECH 467. Finite Element Methods. 1 Credit.
Offered Occasionally; Lecture hours:3,Other:2
Fundamental theory and applications for civil and mechanical engineering. Multidimensional elements, and axisymmetric elements, and their formulations; stress recovery techniques; modeling considerations; convergence criteria and error estimates, includes use of commercial and developmental finite element analysis programs. Prerequisite: MECH 353 or permission of the instructor. Crosslisted as CEEG 408 and CEEG 608 and MECH 667.

MECH 468. Human Movement Biomechanics. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Principles of mechanics applied to human movement. Background in anatomy and physiology, physics, and statistics will be presented. Topics include human movement biomechanics, kinematics and kinetics, electromyography, gait, clinical/atypical movement, and other applications of biomechanics. Prerequisites: MECH 220. Crosslisted as MECH 668.

MECH 473. Materials Characterization. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Theory and practice of materials characterization techniques including phase identification, mechanical testing, and various forms of microscopy. Prerequisite: ENGR 240 or permission of instructor. Crosslisted as MECH 673.

MECH 475. Finite Element Modeling. .5-1 Credits.
Offered Occasionally; Lecture hours:Varies
Introduction to finite element modeling with commercial software. Brief overview of the finite element method and approximation techniques. Modeling of three dimensional solids, including structural and multiphysics analyses. Emphasis of modeling considerations such as boundary conditions, material properties, mesh convergence, sensitivity studies, and other common modeling assumptions. Crosslisted as MECH 675.

MECH 476. Biomechanics. 1 Credit.
Offered Occasionally; Lecture hours:4
Principles of mechanics applied to biological systems. Background in anatomy, physiology, and cell biology will be presented. Mechanical behavior of hard and soft biological materials. Topics in cellular, cardiovascular, musculoskeletal, implant, and sport/motion biomechanics. Prerequisite: MECH 353 or permission of the instructor. Crosslisted as MECH 676.

MECH 478. Biomimetic Materials. 1 Credit.
Offered Occasionally; Lecture hours:3,Recitation:1
Introduction to topics in biomimetics, studying nature as an inspiration for engineering design. Topics include relationships between microstructure and physical properties of natural materials and tissue engineering approaches to biomaterials design. Crosslisted as BMEG 431, BMEG 631 and MECH 678.

MECH 484. Machine Learning for Engineering Systems. 1 Credit.
Offered Occasionally; Lecture hours:4
Machine Learning is a branch of Artificial Intelligence (AI). This course focuses on system modeling and optimization using established machine learning tools such as neural networks and genetic algorithms. MATLAB based. Prerequisite: ENGR 214 or equivalent, or permission of the instructor. Crosslisted as MECH 684.

MECH 485. Advanced Engineering Problems. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:4; Repeatable
An investigation under the direction of a faculty member. Senior-level topics not covered in other courses may be studied in this course. Prerequisites: Senior standing in mechanical engineering and permission of the instructor.

MECH 488. Advanced Topics in Mechanical Engineering. .5-1 Credits.
Offered Occasionally; Lecture hours:4; Repeatable
Advanced, in-depth course developed from areas of mechanical engineering. Topics will vary. Crosslisted as MECH 688.

MECH 495. Advanced Topics in Engineering Mathematics. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Linear algebra and analytical/computational techniques for solving ordinary and partial differential equations relevant to engineering applications. Crosslisted as CEEG 495 and CHEG 495 and MECH 495 and ENGR 695 and ECEG 495 and ECEG 695. Prerequisite: permission of the instructor.

Military Science

Faculty

Director: Maj Jason Rock

Instructors: MAJ Daniel Frantz, CPT Eric Hsu, MSG Jeremy Rutherford

Military Science/Reserve Officer Training Corps (ROTC) is a multiyear program designed to prepare college students as leaders and make possible the commission of military officers into the United States Army, Army Reserve and the Army National Guard. The courses are centered on the development of 16 leadership dimensions.

All Bucknell students may enroll and attend the first-year and sophomore-level classes, with class attendance being the only requirement (two hours weekly for first-year students and sophomores). Bucknell students attending military science classes as students are not part of the formal ROTC program.

ROTC scholarship first-year students and ROTC non-scholarship first and second-year students may enroll on a trial basis with no commitment to the military. Students may leave the program or continue with advanced courses to earn a commission as an officer upon graduation.

The program is intended to start with new first-year students each fall; it is possible to enter the program as late as spring of the sophomore year. Students with prior military service or those who complete a 31-day summer training program may bypass the first-year and sophomore-level training.

Various types and lengths of scholarships are available, some of which can guarantee duty in the Army Reserve or Army National Guard.

Scholarship cadets receive FULL tuition, a subsistence allowance of up to $420 a month, and a book allowance of $1,200 a year. Bucknell University pays room and board for scholarship cadets who live on campus.

Contracted non-scholarship cadets receive a subsistence allowance of $420 a month.

ROTC program requirements include a 35-day summer training course between the junior and senior years. Opportunities exist for other specialized summer training, such as Airborne School, Air Assault School and internships with Active Duty Army units and federal government agencies.

The time commitment for first and second-year cadets during the school year is approximately seven hours a week. For third and fourth-year cadets, the time commitment is approximately 15 hours a week. Time is spent on weekly classes, physical training, monthly leadership labs and a once-a-semester field training exercise.

For more information, contact the ROTC department at 570-577-1013 or 570-577-1246 or by email at armyrotc@bucknell.edu.

Courses

MILS 101. Foundation of Officership. .25 Credits.
Offered Fall Semester Only; Lecture hours:2,Other:1
Focuses on developing comprehension of Army leadership dimensions, attributes and core leader competencies within the U.S. Army, and the Army's role in American society and government.

MILS 102. Basic Leadership. .25 Credits.
Offered Spring Semester Only; Lecture hours:2,Other:1
Further studies focusing on developing comprehension of Army leadership dimensions, attributes and core leader competencies within the U.S. Army, and the Army's role in American society and government.

MILS 201. Individual Leadership Studies. .25 Credits.
Offered Fall Semester Only; Lecture hours:2,Other:1
Builds upon student development of the leadership attributes and core leader competencies through the understanding of Army organizational structures and its duty in American society.

MILS 202. Leadership and Teamwork. .25 Credits.
Offered Spring Semester Only; Lecture hours:2,Other:1
Further studies the theoretical basis of Army leadership requirements model by exploring the dynamics of adaptive leadership in the context of military operations.

MILS 301. Adaptive Team Leadership. .5 Credits.
Offered Fall Semester Only; Lecture hours:3,Other:1
Develops critical thinking skills through practical application of the fundamentals of Army leadership at the lowest organizational levels in the United States Army. Prerequisite: permission of the instructor.

MILS 302. Leadership Under Fire. .5 Credits.
Offered Spring Semester Only; Lecture hours:3,Other:1
Further studies in developing critical thinking skills through practical application of the fundamentals of Army leadership at the lowest organizational levels in the United States Army. Prerequisite: permission of the instructor.

MILS 303. Military History: American Military Experience. .5 Credits.
Offered Either Fall or Spring; Lecture hours:3
A survey course examining the military heritage of the United States from the colonial period to the late twentieth century, developing students' awareness of the relationship of the U.S. military establishment to American society. Further, the course will focus on leadership, technology, doctrinal changes and the formation of today's Army.

MILS 401. Developing Adaptive Leaders. .5 Credits.
Offered Fall Semester Only; Lecture hours:3,Other:1
Transitions the student learning from being trained to becoming a leader. Students study the U.S. Constitution and how it relates to their role as an Army officer. Prerequisite: permission of the instructor.

MILS 402. Leadership in a Complex World. .5 Credits.
Offered Spring Semester Only; Lecture hours:3,Other:1
Explores the dynamics of leading soldiers in full spectrum operations in the contemporary operating environment. Course prepares them for their future role as an Army officer. Prerequisite: permission of the instructor.

FREEMAN COLLEGE OF MANAGEMENT

The Freeman College of Management is a learning community committed to understanding organizations, analyzing them rigorously and devising creative and morally responsible solutions to the challenges they face. Having benefited from an innovative undergraduate curriculum integrating professional and liberal education, our graduates possess strong technical skills as well as the judgment, vision and integrity necessary to serve society and their professions.

Management education at Bucknell is distinguished by the connections we make between management and the other disciplines studied at the University (**breadth**), our long-standing commitment to learning by doing (**experience**), and the opportunities we provide for interaction with alumni and other industry professionals whose stories enrich our learning (**relevance**). All of this occurs in Bucknell's immersive campus culture, which encourages close collaborations among students and faculty (**community**). These qualities – breadth, experience, relevance and community – produce graduates easily distinguished from those of traditional business schools.

Our graduates are actively recruited by leading organizations, including the foremost public accounting and financial services firms, consumer products, fashion and media companies, and a diverse range of entrepreneurial, government and nonprofit organizations. After working for several years, many BSBA graduates successfully complete MBA programs or pursue Ph.D.'s, law degrees and other advanced programs of study. Management education not only prepares students to become managers but also fits them to be citizens in a society shaped by the actions of complex organizations.

Bucknell's business degree programs, offered under the aegis of the Freeman College of Management, are accredited by the Association to Advance Collegiate Schools of Business (AACSB).

Curricula Overview (MG)

Curricula in the Freeman College of Management lead to the Bachelor of Science in Business Administration (BSBA) degree, with majors in:

- Accounting (ACFM (p. 411))
- Finance (ACFM) (p. 417)
- Business Analytics (ANOP) (p. 426)
- Management & Organizations (MORS) (p. 430)
  - Concentration in Entrepreneurship
  - Concentration in Global Management
  - Concentration in Human Resource Management
  - Concentration in Management & Organizations
  - Concentration in Managing for Sustainability
- Markets, Innovation & Design (MIDE) (p. 437)

In addition, the college offers a Bachelor of Management for Engineers (BME) (p. 424) degree and elective courses to meet the needs of students across the University who want to better understand the basic structures, operating mechanisms and management principles governing businesses and other organizations.

Students not enrolled in one of our degree programs are encouraged to engage with management subjects and enroll in management classes according to their interests.

Language and Cultural Immersion Scholars Program (LCISP)

The Language and Cultural Immersion Scholars Program offers Freeman College of Management students an opportunity to complete enhanced language and cultural courses, and to engage in experiences that cultivate intercultural competency. Students who satisfy the requirements will have "Language and Cultural Immersion Scholar" added to their transcript.

After placement into an appropriate language level in consultation with the language area of study, the requirements are: (a) completion of four language courses, (b) completion of two language and cultural immersion courses, and (c) participation in an approved study abroad program or an international internship experience.

The cultural immersion experience (study abroad or international internship) must be connected to the language/culture of study. International students must choose a language other than their native language.

The Language and Culture Immersion Scholars Program includes the following language departments and programs: Arabic, Chinese, Classics and Ancient Mediterranean Studies, French, German, Hebrew, Italian Studies, Japanese, Russian, and Spanish.

Please visit www. (http://www.bucknell.edu/LCISP/)bucknell.edu/LCISP for specific requirements in each language and cultural area.

General Education Curriculum

This general education curriculum integrates an interrelated set of principles that emphasizes intellectual and practical skills, transferable tools for integrative learning, and disciplinary perspectives designed to enhance the framing of students' management education. It recognizes writing, oral communication and information literacy as central tools for learning and disseminating new knowledge that permeate the entirety of the learning experience. The curriculum is intended to help students understand the synergistic and complementary relationships among academic disciplines and their varied approaches to describing, analyzing, comprehending, interpreting and critiquing a range of phenomena in both human cultures and the physical and natural world. In doing so, it will prepare students to apply the skills, knowledge and sense of responsibility they have gained to new settings and complex problems as engaged citizens in an interconnected world.

Although students across the college will satisfy their graduation requirements with different courses, each student must select those courses in accordance with the college general education curriculum requirement, the BSBA core requirements and the University Writing Requirement (https://coursecatalog.bucknell.edu/academicsupportcampuslife/writingprogram/).

Components of the Freeman College of Management General Education Curriculum

Foundational Experiences

- Foundation Seminar
- Lab Science
- Foreign Language
- Race, Power & Inequality
- Nature, People & Justice
- Global Connections

Disciplinary Exploration

- Arts & Humanities
- Natural Sciences & Mathematics
- Social Sciences/Management

Disciplinary Depth

- The Freeman College Core
- The Major(s)
- Academic Conventions of Writing, Speaking and Information Literacy
- Culminating Experience

With the exception of foundation seminars, any other course from the Foundational Experiences group may also count as a course within the Disciplinary Exploration category. Advanced Placement (AP) courses, International Baccalaureate (IB) courses, and courses taken elsewhere for Bucknell credit may be used to fulfill general education requirements only when approved by the appropriate department chair and the coordinator of the general education. Any course that fulfills the Freeman College General Education Curriculum requirement and/or a University writing requirement may also count toward a major or a minor.

The following descriptions articulate the requirements for each of the components of the Freeman College General Education Curriculum.

Foundational Experiences

Transferable knowledge and a range of intellectual abilities drawn from different modes of inquiry across disciplines are essential components of any liberal education. These courses help students develop important academic capacities for use during their undergraduate career and in the rapidly changing world they will enter after college.

- **Foundation Seminar:** one writing-intensive W1 course in the fall of the first year.
- **Lab Science:** one course from the list of designated courses. Also counts as a Natural Sciences & Mathematics disciplinary exploration requirement.
- **Foreign Language:** one course from the list of designated courses. Also counts as an Arts & Humanities disciplinary exploration requirement.
- **Race, Power & Inequality or Diversity in the United States:** one course from the designated list of courses. Also counts as an appropriate disciplinary exploration requirement.
- **Nature, People & Justice or Environmental Connections:** one course from the designated list of courses. Also counts as an appropriate disciplinary exploration requirement.
- **Global Connections:** one course from the designated list of courses. Also counts as an appropriate disciplinary exploration requirement.

Disciplinary Exploration

Courses in this category expose students to a wide range of modes of intellectual inquiry. To ensure that students sample broadly from Bucknell's curricular offerings, they are required to take **three** courses from the division of Arts & Humanities and **two** courses from each of the Natural Sciences & Mathematics, and Social Sciences/Management divisions. One course from the Natural Sciences & Mathematics area will be satisfied by the lab science requirement and one course from the Arts & Humanities area will be satisfied by the foreign language requirement. Each of the Race, Power & Inequality; Nature, People & Justice; and Global Connection experiences may also double count as Disciplinary Exploration courses.

Disciplinary Depth

The disciplinary depth component of the curriculum provides students with the opportunity for sustained study in an academic discipline. Students learn to think deeply about a set of linked topics and the methodology of academic investigation in a specific field or a set of subfields, and within these categories they extend and develop their own ideas with more sophisticated and informed analysis. They acquire the intellectual confidence that comes from mastery of a body of knowledge and develop the skills to apply their learning beyond their coursework.

The Freeman College Core

The Freeman College Core requirements (p. 404) comprise those management courses that all candidates for the BSBA degree must complete regardless of major. It is designed to cultivate three forms of literacy relevant to managerial thought: foundational, managerial and integrative. All BSBA graduates must acquire these literacies, as they are the fundamental knowledge and skills necessary for managers, regardless of organization, industry, function or sector.

The Major(s)

The academic major provides students with a framework for focused disciplinary study. Through a set of linked courses defined by faculty in departments and programs, students develop expertise in their discipline. Students in major courses have common academic backgrounds and therefore upper-level major courses can address academic material at a sophisticated level.

Academic Conventions of Writing, Speaking and Information Literacy

The college faculty has identified writing, speaking and information literacy as essential intellectual competencies that need to be mastered by competent graduates. In-depth and discipline-specific study affords students an opportunity to practice these activities at a high level, therefore the curriculum of each major helps students meet the learning goals of speaking, information literacy and writing through a variety of means.

Writing: Students will develop their writing abilities through coursework in the University Writing Program. Courses in the major will allow students to apply their writing ability to address and investigate issues at a more sophisticated level because of their mastery of the subject matter. These courses will allow students to write about topics they know best.

Speaking: Students will develop skills in formal presentation at a level reasonable for a college graduate in the particular major. Ways in which this skill can be obtained and practiced include but are not restricted to a course with student presentations, honors thesis defense, talk in a student colloquium series, presentation at a conference, or presentation of significant course projects.

Information Literacy: In the foundation seminar and in many other courses, students have achieved basic competency in finding, analyzing, evaluating and effectively using various sources of information. Courses in the major will build on these skills and introduce students to field-specific information retrieval techniques and to critical evaluation of content as customary in the field.

Culminating Experience

In addition to completing a body of specialized coursework, students in each major will complete an approved Culminating Experience in the second semester of their junior year or either semester of their senior year. First-semester juniors may complete a Culminating Experience in a major with permission of the adviser and the department chair. The successful Culminating Experience will draw together a student's disciplinary experiences and provide a more coherent appreciation of the major's academic discipline. The structure of the Culminating Experience is left to the discretion of the faculty in the department or program offering the major (subject to the review of the Freeman College of Management Curriculum Committee). Types of Culminating Experiences will vary by major, but they may include a senior seminar, interdisciplinary course, independent study project, service learning or an honors thesis.

Freeman College Core Requirements

The Freeman College core requirements comprise those management courses that *all* candidates for the BSBA degree must complete regardless of major. It is designed to cultivate three forms of literacy relevant to managerial thought: foundational, managerial and integrative. All BSBA graduates must acquire these literacies as they are the fundamental knowledge and skills necessary for managers, regardless of organization, industry, function or sector.

All BSBA candidates ordinarily will have completed at least three of the four foundational literacy core courses by the end of the first year. When this is not possible, students should plan to complete all four foundational literacy and at least two managerial literacy core courses by the end of their sophomore year.

FOUNDATIONAL LITERACY REQUIREMENTS

ANOP 102	Spreadsheet Modeling & Data Analysis	1
ECON 101	Economic Principles/Problems	1
MGMT 100	Exploring Management	.5
MGMT 101	Introduction to Organization and Management	1

MANAGERIAL LITERACY REQUIREMENTS

ACFM 104	Foundations of Accounting I	1
ACFM 203	Corporate Finance	1
ANOP 202	Operations Management	1
MIDE 201	Marketing	1

INTEGRATIVE LITERACY REQUIREMENT

MORS 302	Responsible Management	1
or MGMT 303	Technological Dystopia	

Total credits required: 8.5

Bachelor of Science in Business Administration Majors

Candidates for the BSBA degree must fulfill all University degree requirements including the Freeman College of Management General Education Curriculum, the Freeman College Core, and the major program requirements. All BSBA major programs require the completion of 32 credits. Students must maintain good academic standing as defined for their class.

Freeman College of Management General Education Curriculum

Consistent with the Freeman College of Management's commitment to its graduates receiving a strong liberal education, all candidates for the BSBA degree must fulfill a sequence of general education classes taken in the College of Arts & Sciences. Details of the Freeman College of Management General Education Curriculum can be found here (p. 403). In addition, all BSBA candidates take courses that address the instruction in writing, speaking and information literacy goals of the General Education Curriculum, and they also must address the requirement of a Culminating Experience.

To satisfy the University writing requirement, a student must successfully complete three writing courses: one course designated W1 (that must be taken during the first year and must be taken before the W2 courses), and two W2 courses (usually taken after the first year, but in any case, at least one of which must be taken after the first year). Lists of W1 and W2 courses are available from the registrar's office webpage under Course Information (http://www.bucknell.edu/CourseInformation/). Writing courses are designed to enhance the student's understanding of the writing process and to emphasize that writing is a way of learning as well as a communication skill. They may be taken in any department, program or college.

Major Declaration

In the spring of their sophomore year, all BSBA students will, in consultation with their advisers, select a major from one of the Freeman College of Management departments. Students must complete the specific major requirements in addition to the Freeman College core curriculum requirements (p. 404) to fulfill graduation requirements. Students will receive approval for a change of major within the Freeman College of Management if they can demonstrate the ability to meet the degree requirements of the new major without delaying their graduation date.

Students may not double major in two different departments within the Freeman College of Management. Details on all areas of study can be found here (https://www.bucknell.edu/academics/freeman-college-management/majors-departments/).

Double Majors and/or Minors in the College of Arts & Sciences

Occasionally, a BSBA candidate will undertake a double major with a field in the College of Arts & Sciences. Similarly, students may pursue a departmental or interdepartmental minor if the student meets all obligations of the program selected within the required eight semesters. (Declaration of a second major or minor can be completed through the Office of the Registrar; second majors are subject to University academic policy concerning degrees and majors (http://coursecatalog.bucknell.edu/academicstandardspolicies/academicpoliciesandrequirements/).)

Internal Transfer into the BSBA Degree Program

Enrollment in the BSBA degree program is limited to students who were admitted directly into the Freeman College of Management at the time of their initial application to Bucknell.

Bachelor of Science in Engineering & Bachelor of Management

The five-year program in engineering and management offers students the opportunity to combine the study of engineering in any of the engineering degree programs with a selected sequence of courses in management. Upon successful completion of this program, the joint degree, the Bachelor of Science in Engineering degree (within a specific engineering discipline), and the Bachelor of Management for Engineers degree is awarded. The degree has the same accreditation status as the four-year bachelor of science degree in the engineering program selected. See Bachelor of Management for Engineers (p. 424) for specific course requirements.

Enrollment in the Bachelor of Management for Engineers program is limited to first-time, first-year students who are admitted directly into the program at the time of their initial application to Bucknell. All students interested in the five-year engineering/management program must apply for admission to Bucknell through the College of Engineering. The Freeman College of Management does not offer an internal transfer process, so students admitted in either the College of Arts & Sciences or the College of Engineering may not transfer into the Freeman College of Management. Prospective students interested in pursuing this five-year degree program are encouraged to consult with the associate dean of engineering as admission to this joint degree program is competitive for a limited number of spots available each year.

Suggested course sequences for the program and detailed information on the degree requirements are available from the Office of the Dean of Engineering and the Freeman Office of Student Services.

Optional Minors (MG)

Minors are optional both on the part of faculty and students; no department or group of faculty members is required to offer a minor and no student can be required to elect a minor. Please consult Academic Standards & Policies (p. 451) for additional details on minor regulations and how to declare a minor.

Optional minors are available to regular undergraduate students in each of the areas listed below. Details of the requirements for each minor are listed on the indicated pages.

- Accounting (p. 413)
- Business Analytics (p. 428)
- Entrepreneurship (p. 434)
- Human Resource (p. 434)
- Management (p. 406)
- Markets, Innovation & Design (p. 439)
- Real Estate (p. 420)

In addition, the Freeman College of Management contributes courses to four University interdepartmental minors: Arts Leadership (p. 37), Legal Studies (p. 211), Public Policy (p. 290) and Social Justice (p. 299).

Management Minor

Management Minor

The curricular objective of the management minor is driven by Bucknell's central commitment to the integration of professional education and the liberal arts. The minor in management requires successful completion of five courses, with no more than two being transfer courses, and each bearing at least 0.75 credits, as follows:

No more than three 200-level or below management courses. [1]	3
At least two 300-level or above management courses. [1]	2

[1] Courses bearing one of the following prefixes: ACFM, ANOP, MGMT, MIDE or MORS.

Areas of Study (MG)

- Accounting & Financial Management (p. 407)
  - Accounting (p. 411)
  - Finance (p. 417)
- Bachelor of Management for Engineers (p. 424)
- Business Analytics (p. 426)
- Management & Organizations (p. 430)
- Markets, Innovation & Design (p. 437)

Accounting & Financial Management

Faculty

Professors: Raquel Meyer Alexander, Sandy Bond (Practice), Janice M. Traflet

Associate Professors: Tom G. Geurts, David E. Jensen, Stacy Mastrolia (Chair), Curtis Nicholls, Ankur Pareek, Frank Schreiner (Practice), Kate Suslava

Assistant Professors: Kylie (Seward) Aikey (Practice), Vaska Atta-Darkua, Amber Lawson (Practice), James G. Lawson, Karen Mitchell McGrath, Julie Mercado, Vernan Rivera, Ryan Stauffer, Daniel A. Street

Accounting and financial management are becoming progressively more complicated. Thus, accounting and financial management require sophisticated thinking as international differences, regulatory requirements and the turbulent business environment place new demands on those who are responsible for the efficient use of capital. We believe that a program to train professionals for this kind of world will look somewhat different from traditional programs. To succeed in this uncertain environment, financial services professionals need more than just a basic grasp of analytical tools and conventions. They need to be able to look at the broader economic and political contexts in which financial decisions are made. They must be able to make decisions under conditions of varying uncertainty. That's why we have chosen to blur the lines between accounting and finance. That's why the courses that we teach focus on decision-making and judgment. That's why we spend time exploring the political dynamics that produce accounting standards. Our goal is to ground students in concepts and principles that will ensure their ability to grow professionally.

The Accounting & Financial Management (ACFM) department offers the following majors and minors:

- Accounting (p. 411)
- Finance (p. 417)
- Accounting Minor (p. 413)
- Real Estate Minor (p. 420)

Whether a student chooses to major in accounting or finance, ACFM graduates should embrace the values of responsible citizenship and possess the technical proficiencies necessary to account for financial resources and to allocate them efficiently. ACFM fosters critical thinking, emphasizes interdisciplinary competence, encourages intellectual curiosity and promotes professional ethics. Both accounting and finance majors are exposed to technical rigor, and they are challenged to consider the historical, political, economic and social tensions that exist among diverse stakeholder groups. Students must also understand the personal and social impact of their professional behavior and evaluate their moral underpinnings.

In the spring of their sophomore year, all BSBA students will, in consultation with their advisers, select a major in one of the Freeman College of Management departments and will complete the specific major requirements in addition to the BSBA core curriculum requirements (p. 404). Students selecting ACFM must choose to major in either accounting or finance. Transferring between majors within the Freeman College of Management is possible as long as the student will be able to meet all degree requirements of the new major and still graduate on schedule.

Drawing upon their professional and liberal education, Freeman College of Management students will be able to collaboratively create positive societal impacts through:

Analysis

- Students will demonstrate the ability to understand organizations and analyze them rigorously.

Integrity

- Students will possess the judgment, vision and integrity necessary to serve society and their professions.

Morality

- Students will identify creative and morally responsible solutions to organizational and societal issues.

Beyond these Freeman College learning goals, graduates of the Accounting & Financial Management program will complete a curriculum designed to develop the critical thinking, technical, problem-solving, communication and interpersonal skills necessary to achieve the highest level of success in accounting and financial management careers. Specific educational objectives of our program of study include:

- Enhance students' communication skills.
- Facilitate development of effective interpersonal and leadership skills.
- Adequately prepare students seeking professional certifications.
- Exercise and hone students' analytical skills.
- Enhance students' awareness and use of information technology and systems.
- Heighten each student's understanding of the global infrastructure of today's business operations.
- Raise student awareness of the ethical ramifications of business transactions.

- Impress upon students that a market-based economic system cannot function without citizens' ability to understand accounting and financial information.

To accomplish our goals, we moved the curriculum away from a traditional rules-based financial statement preparation approach and focus more on the concepts underlying financial reporting and financial management. This move improves financial literacy and provides an opportunity for our students to investigate specialized fields of accounting and finance (e.g., public accounting, corporate accounting and finance, investments, investment and commercial banking, etc.). Our approach emphasizes activities that require students to analyze information and communicate their conclusions, thus developing their decision-making abilities and professional judgment.

Courses

ACFM 104. Foundations of Accounting I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
Introduction to accounting and financial management including financial statement preparation and analysis, cost relationships, time value of money and capital budgeting.

ACFM 150. Finance Speaker Series. .5 Credits.
Offered Both Fall and Spring; Lecture hours:1,Other:1
The Finance Speaker Series provides students, early in their college careers, a comprehensive view of the opportunities in the financial services industry. Students will meet and engage with professionals that have invaluable knowledge/experience in investment management, private equity, wealth management, venture capital, accounting, corporate finance and entrepreneurial endeavors. Repeatable once.

ACFM 201. Business Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to business law. Topics include contracts, the Uniform Commercial Code, agency and business structures. No first-years.

ACFM 202. Business Law II. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2
This course will provide an overview of, at a minimum: property- real, personal and intellectual; crimes related to business; intentional torts and product liability; government regulation, including antitrust and consumer protection; an introduction to trusts and estates; and environmental protection. Prerequisite: ACFM 201. No first-years.

ACFM 203. Corporate Finance. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Concepts, principles, and recent innovations in corporate finance: risk and return, valuation, capital budgeting and structure, dividend policy, financial planning, risk management. Prerequisites: ACFM 104.

ACFM 204. Foundations of Accounting II. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
Covers general purpose financial statements, the theoretical framework that underlies the measurement of income, and asset and liability valuation. Prerequisite: ACFM 104.

ACFM 205. Personal Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course is open to all students from all colleges with no prerequisites. It follows a very practical approach to help students understand their finances and to feel confident making decisions about budgeting and taxes, saving and investing, managing debt and credit, and purchasing insurance (e.g., health, auto, disability, life). No accounting or finance majors.

ACFM 266. Principles of Real Estate. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This class will provide an overview of the real estate industry including roles, activities and players in the industry; basic legal aspects of ownership and various contracts; and the valuation of various real estate assets and debt instruments.

ACFM 310. Independent Study. .25-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Individual study or projects, supervised by instructor. Prerequisite: permission of the instructor.

ACFM 311. Teaching Assistant in Accounting & Financial Management. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:3,Other:1; Repeatable
Teaching assistant in an accounting or finance class, supervised by the instructor. Prerequisite: permission of the instructor.

ACFM 314. Special Topics in Accounting & Financial Management (.5 course credit). .5 Credits.
Offered Either Fall or Spring; Lecture hours:2; Repeatable
Topic is specific to the semester offered. Course description will be provided prior to registration. Identical course topic may not be repeated if taken in a previous semester under a different course subject prefix. Prerequisites, if any, will be established by instructor each semester.

ACFM 315. Special Topics in Accounting and Financial Management. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:Varies; Repeatable
A seminar on selected topics in accounting and financial management. Prerequisite: permission of the instructor.

ACFM 321. Intermediate Financial Accounting I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Accounting theory and practice applicable to income determination and asset valuation. This course develops students' understanding of the accounting and financial reporting environment. Prerequisite: ACFM 204.

ACFM 322. Intermediate Financial Accounting II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A continuation of ACFM 321. Topics include: investments, debt, leases, pensions, deferred taxes, EPS, equity, and cash flows. Prerequisite: ACFM 321.

ACFM 323. Advanced Financial Accounting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Accounting theory and practice applicable to business combinations and additional advanced topics related to financial reporting. Prerequisite: ACFM 322 or concurrent enrollment.

ACFM 324. Individual Federal Income Taxes. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Survey of federal income taxes with emphasis on individual tax law, practice and planning. Prerequisite: ACFM 104. No first-years.

ACFM 325. Corporate, Partnership, Gift & Estate Taxes. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Advanced topics in federal income, gift and estate taxation, with primary emphasis on corporate and pass-through entity tax law, practice and planning. Prerequisite: ACFM 324.

ACFM 326. Managerial & Cost Accounting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Examines managerial accounting and cost behavior, specifically, how product cost information is recorded, reported, analyzed and used by managers in decision making. Includes preparation and analysis of operating budgets and capital budgets. Prerequisite: ACFM 204.

ACFM 327. Auditing & Assurance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This course helps students develop a strong foundation for quality professional judgments to support the practice of auditing by examining professional and ethical standards and understanding the audit process. Prerequisites: ACFM 321 and ACFM 329 or concurrent enrollment. Junior/Senior only.

ACFM 328. Topics in Accounting. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration.

ACFM 329. Accounting Information and Analytics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Students will learn how accounting information is stored in databases and how to retrieve and process that information using analytical techniques to provide useful information for decision-making. Prerequisites: ACFM 204 and ANOP 102.

ACFM 330. Managerial Accounting and Quantitative Decision Making. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
An emphasis on how managers apply statistical modeling, forecasting, data visualization and operations research techniques to the analysis of business operations and performance using internal accounting data. Prerequisites: ACFM 329 or concurrent enrollment.

ACFM 335. Negotiations & Conflict Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will teach students how to prepare for negotiations and address conflicts. This includes learning negotiation strategies in theory and applying them in simulations. The course will give students the tools to increase their chances of success in negotiations. No first-years.

ACFM 361. Financial Statement Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will learn to read, analyze, and interpret financial disclosures at a more sophisticated level, and learn statement analysis to make judgments about the quality of reported earnings, to forecast future results and, ultimately, to value companies. Prerequisites: ACFM 203 and ACFM 204.

ACFM 362. Investments. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Principles of investment practice and theory. Emphasis on the fundamentals of intangible investments (equities, debt and derivative instruments). Prerequisites: ACFM 203, ACFM 361 or concurrent enrollment and ANOP 102 and (PSYC 215 or MATH 192 or MATH 201 or MATH 216) or permission of the instructor.

ACFM 363. Topics in Financial Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration. Prerequisites, if any, will be set by the instructor.

ACFM 364. Topics in Financial Markets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration. Prerequisites, if any, will be set by the instructor of each course.

ACFM 366. Topics in Real Estate. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course description at the time of registration. Prerequisites, if any, will be set by the instructor.

ACFM 367. The Global Flow of Capital. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore the challenges of financial management in a global context. Prerequisite: ACFM 203 or permission of the instructor.

ACFM 368. Affordable Housing: Policy and Practice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will provide an overview of the myriad and complex issues faced by housing practitioners and policy analysts in their collective struggle to secure a decent, affordable home for all.

ACFM 369. Real Estate Finance & Investments. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the key concepts and strategies in real estate financing and investment. Students will learn about the sources and types of finance for real estate transactions and the underwriting process. They will be introduced to investment analysis, after-tax assessment and the application of computer models to investment decisions. Prerequisite: ACFM 266.

ACFM 370. Fixed Income. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an understanding of different fixed income offerings: government/municipal/corporate bonds, and MBS. Students will understand the relationship between the price, measures of return and measures of risk of a bond. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 371. Financial Planning. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides a personal financial planning overview including: financial planning process, CFP Board's code of ethics, budgeting, personal income tax planning, managing credit/debt, risk management/insurance, investing to achieve goals and creating a financial plan for clients. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 372. Advanced Corporate Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students integrate principles and strategies from accounting, statistics, finance, and economics to understand complex financial topics including mergers/acquisitions, valuation, financing, risk management, and corporate governance. Students draw from psychology, history, economics, and other disciplines to understand/model the behavior of financial markets. Prerequisites: ACFM 203 and ACFM 361 or concurrent enrollment and (MATH 192 or MATH 201 or MATH 216).

ACFM 373. Risk & Portfolio Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course analyzes the difference between risk and uncertainty, its quantification, and how to manage them through the creation of a portfolio. Risk, return, and practical portfolio applications will be analyzed, in particular, mutual funds, ETFs, REITs, (C)MBS, and CDOs. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 374. Quantitative Investment Strategies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores quantitative investment strategies used by hedge funds. Students learn to use python and data science techniques to backtest and implement several of the most successful investment strategies. The course also covers issues related to performance measurement, transaction costs, risk management and portfolio construction. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216). Junior/Senior only.

ACFM 375. Student Managed Investment Fund I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This is a two-semester portfolio management course in which students manage a real dollar investment portfolio. ACFM 375 (SMIF I) and ACFM 476 (SMIF II) may be taken in any order, but both must be completed in order to receive course credit. Prerequisites: ACFM 362 and permission of the instructor. Only open to juniors/seniors and 4th year of 5-year engineers.

ACFM 378. Investment Banking. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an introduction to the world of investment banking. Students will gain a solid understanding of the key roles and responsibilities of investment bankers in facilitating corporate finance and asset management activities. Prerequisite: ACFM 362 or concurrent enrollment. Only open to juniors, seniors and 4th year of 5-Year engineers.

ACFM 381. Derivatives. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on the use of derivative securities, particularly listed stock and index options, to shape the risk and return characteristics of a well-diversified portfolio. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216).

ACFM 382. Behavioral Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the role of psychology in understanding many fundamental topics in finance. Topics include psychological foundations of behavioral finance, stock return anomalies and behavioral corporate finance. The course also includes a final project in which students develop and test a novel investment strategy. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216). Open to juniors/seniors.

ACFM 383. Entrepreneurial Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on financial decisions faced by new ventures, considering the viewpoints of both entrepreneurs and venture capitalists. Topics include opportunity identification, business valuation, financing methods/strategy, venture capital, compensating/attracting employees and exit (harvest). Financing methods covered include traditional routes as well as newer ones such as crowdfunding and ICO. Prerequisite: ACFM 104. Only open to juniors and seniors.

ACFM 384. Fundamentals of ESG Investing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will provide an introduction to sustainable investing and will explore what is meant by ESG (environmental, social, governance). We will consider the different ways to integrate ESG factors into the investment process within the three main investment types: debt, equity and real estate. Not first-years.

ACFM 391. History of the Securities Markets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Traces how the United States has become an "equity nation" where most citizens own common stock. Also explores pivotal moments in stock market history. Only open to juniors and seniors.

ACFM 400. Honors Course in Accounting & Financial Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Special and independent studies for Accounting and Financial Management majors selected under guidelines of the College and the University Honors Council. Honors thesis required. Prerequisites: nomination by the College and permission of the instructor.

ACFM 420. Accounting Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An integrative seminar usually offered once each academic year. Can fulfill culminating experience requirement for ACFM-CPA track majors. The course may include: SEC regulation, financial analysis, probability and statistics, macroeconomics, managerial finance, personal finance and behavioral aspects of accounting. Prerequisites: ACFM 203 and ACFM 322. Only open to seniors and accounting and finance majors.

ACFM 476. Student Managed Investment Fund II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This is a two-semester portfolio management course in which students manage a real dollar investment portfolio. ACFM 375 (SMIF I) and ACFM 476 (SMIF II) may be taken in any order, but both must be completed in order to receive course credit. Prerequisites: ACFM 362 and permission of the instructor. Open to juniors, seniors and 4th year of 5-year engineers.

Accounting

Faculty

Professors: Raquel Meyer Alexander, Sandy Bond (Practice), Janice M. Traflet

Associate Professors: Tom G. Geurts, David E. Jensen, Stacy Mastrolia (Chair), Curtis Nicholls, Ankur Pareek, Frank Schreiner (Practice), Kate Suslava

Assistant Professors: Kylie (Seward) Aikey (Practice), Vaska Atta-Darkua, Amber Lawson (Practice), James G. Lawson, Karen Mitchell McGrath, Julie Mercado, Vernan Rivera, Ryan Stauffer, Daniel A. Street

Students who choose accounting as a major have an excellent foundation for exploring a wide variety of career paths. The majority of our majors begin their careers in the Big 4 and middle market public accounting firms. However, larger corporations that offer financial leadership rotation programs are also an excellent choice to begin their careers. Given that finance is based on an understanding of accounting, accounting majors have also gone directly into positions in finance (e.g., private equity). Accounting alumni have become partners in Big 4 firms and investment firms, CEOs and CFOs of large corporations, serial entrepreneurs, leaders in the not-for-profit sector, business school deans and philanthropists.

Accounting Minor

Students who recognize the benefits of an accounting background but wish to pursue another major should consider our accounting minor.

The CPA Exam

Unlike many other undergraduate programs, the flexibility of Bucknell's accounting major enables students to satisfy the educational requirements established by many states to sit for the CPA exam (students interested in a particular state should contact its State Board of Accountancy to determine its specific rules and regulations). Although the accounting degree program requires only 128 semester hours, students may earn up to 150 semester hours in four academic years by supplementing degree requirements with a combination of Advanced Placement (AP) credits, course overloads, summer classes, College Level Examination Program (CLEP) exams, online coursework and/or internships. Flexibility exists in how students may earn the semester hours required to accommodate state-specific variations in licensing requirements. For example, students may take 4.5 courses each semester for no additional tuition and without requesting approval of the associate/assistant dean (a 5-course load also is permissible after completion of the first semester and for no additional tuition with the approval of the associate/assistant dean). Thus, a student who opts to take 4.5 courses each semester will earn 144 semester hours over the course of four years, leaving only six hours to be completed via the methods noted above. Although faculty will advise students concerning course selection, the student is responsible for choosing those courses and experiences that meet a specific state's requirements to sit for the CPA exam.

Accounting Major Requirements

Accounting majors must take the following eight courses:

ACFM 201	Business Law	1
ACFM 204	Foundations of Accounting II	1
ACFM 321	Intermediate Financial Accounting I	1
ACFM 322	Intermediate Financial Accounting II	1
ACFM 324	Individual Federal Income Taxes	1
ACFM 326	Managerial & Cost Accounting	1
or ACFM 330	Managerial Accounting and Quantitative Decision Making	
ACFM 327	Auditing & Assurance	1
ACFM 329	Accounting Information and Analytics	1
CE Requirement		
ACFM 323	Advanced Financial Accounting	1
or ACFM 327	Auditing & Assurance	
or ACFM 420	Accounting Seminar	

Culminating Experience

All BSBA majors must satisfy the Culminating Experience component of the Freeman College of Management General Education Curriculum by taking a course designated as such **on campus** no earlier than the second semester of the junior year.

Accounting majors fulfill this requirement by successfully completing one of the following: ACFM 323 Advanced Financial Accounting, ACFM 327 Auditing & Assurance or ACFM 420 Accounting Seminar.

First Year

Credits	First Semester	Credits	Second Semester	Credits
Either Semester	MGMT 100[#]	.5	ACFM 104[#]	1
ANOP 102[#]	1		MGMT 101 (Should not double with lab science)	1
ECON 101	1			
	2	**0.5**		**2**

Sophomore

Credits	First Semester	Credits	Second Semester	Credits
Either Semester	MIDE 201	1	ACFM 321[#, So/Jr]	1
ACFM 203	1			
ACFM 204[#]	1			
ACFM 329	1			
ANOP 202[#]	1			
	4	**1**		**1**

Junior

Credits	First Semester	Credits	Second Semester	Credits
Either Semester	ACFM 322 (Fall semester only)[#, Jr/Sr]	1	ACFM 326 or 330[Jr/Sr]	1

ACFM 201	1	ACFM 324 (Fall semester only)[Jr/Sr]	1
ACFM 327[CE, Jr/Sr]	1		
MORS 302 or MGMT 303[Jr/Sr]	1		
	3	**2**	**1**

Total Credits: 16.5

Accounting majors are recommended to complete the following elective courses in preparation for material covered on the CPA exam: ACFM 202, ACFM 323 (Sr, CE) and ACFM 325 (Spring semester only, Jr/Sr).

CE Qualifies for Culminating Experience if taken spring of junior year or either semester of senior year.
Must be taken in numerical order as each serves as a prerequisite for the next.
So/Jr Can be taken sophomore or junior year.
Jr/Sr Can be taken junior or senior year.

Accounting Minor

Students who recognize the benefits of an accounting background but wish to pursue another major should consider completing a minor in accounting. This course of study first provides a foundation in financial accounting and then allows students to choose courses that align with their particular area of interest.

The minor in accounting consists of 5 courses in the discipline, as follows. First, students must take the following three courses:

ACFM 104	Foundations of Accounting I [1]	1
ACFM 204	Foundations of Accounting II	1
ACFM 321	Intermediate Financial Accounting I	1

[1] All BSBA students are exempt from taking ACFM 104 as a requirement of the accounting minor, thus only needing the other four requirements to complete the minor.

In addition, students must choose two courses from the following list:		2
ACFM 322	Intermediate Financial Accounting II	
ACFM 323	Advanced Financial Accounting	
ACFM 324	Individual Federal Income Taxes	
ACFM 325	Corporate, Partnership, Gift & Estate Taxes	
ACFM 326	Managerial & Cost Accounting	
or ACFM 330	Managerial Accounting and Quantitative Decision Making	
ACFM 327	Auditing & Assurance	
ACFM 329	Accounting Information and Analytics	
ACFM 420	Accounting Seminar	

Drawing upon their professional and liberal education, Freeman College of Management students will be able to collaboratively create positive societal impacts through:

Analysis

- Students will demonstrate the ability to understand organizations and analyze them rigorously.

Integrity

- Students will possess the judgment, vision and integrity necessary to serve society and their professions.

Morality

- Students will identify creative and morally responsible solutions to organizational and societal issues.

Beyond these Freeman College learning goals, graduates of the Accounting & Financial Management program will complete a curriculum designed to develop the critical thinking, technical, problem-solving, communication and interpersonal skills necessary to achieve the highest level of success in accounting and financial management careers. Specific educational objectives of our program of study include:

- Enhance students' communication skills.
- Facilitate development of effective interpersonal and leadership skills.
- Adequately prepare students seeking professional certifications.
- Exercise and hone students' analytical skills.
- Enhance students' awareness and use of information technology and systems.
- Heighten each student's understanding of the global infrastructure of today's business operations.
- Raise student awareness of the ethical ramifications of business transactions.
- Impress upon students that a market-based economic system cannot function without citizens' ability to understand accounting and financial information.

To accomplish our goals, we moved the curriculum away from a traditional rules-based financial statement preparation approach and focus more on the concepts underlying financial reporting and financial management. This move improves financial literacy and provides an opportunity for our students to investigate specialized fields of accounting and finance (e.g., public accounting, corporate accounting and finance, investments, investment and commercial banking, etc.). Our approach emphasizes activities that require students to analyze information and communicate their conclusions, thus developing their decision-making abilities and professional judgment.

Courses

ACFM 104. Foundations of Accounting I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
Introduction to accounting and financial management including financial statement preparation and analysis, cost relationships, time value of money and capital budgeting.

ACFM 150. Finance Speaker Series. .5 Credits.
Offered Both Fall and Spring; Lecture hours:1,Other:1
The Finance Speaker Series provides students, early in their college careers, a comprehensive view of the opportunities in the financial services industry. Students will meet and engage with professionals that have invaluable knowledge/experience in investment management, private equity, wealth management, venture capital, accounting, corporate finance and entrepreneurial endeavors. Repeatable once.

ACFM 201. Business Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to business law. Topics include contracts, the Uniform Commercial Code, agency and business structures. No first-years.

ACFM 202. Business Law II. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2
This course will provide an overview of, at a minimum: property- real, personal and intellectual; crimes related to business; intentional torts and product liability; government regulation, including antitrust and consumer protection; an introduction to trusts and estates; and environmental protection. Prerequisite: ACFM 201. No first-years.

ACFM 203. Corporate Finance. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Concepts, principles, and recent innovations in corporate finance: risk and return, valuation, capital budgeting and structure, dividend policy, financial planning, risk management. Prerequisites: ACFM 104.

ACFM 204. Foundations of Accounting II. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
Covers general purpose financial statements, the theoretical framework that underlies the measurement of income, and asset and liability valuation. Prerequisite: ACFM 104.

ACFM 205. Personal Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course is open to all students from all colleges with no prerequisites. It follows a very practical approach to help students understand their finances and to feel confident making decisions about budgeting and taxes, saving and investing, managing debt and credit, and purchasing insurance (e.g., health, auto, disability, life). No accounting or finance majors.

ACFM 266. Principles of Real Estate. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This class will provide an overview of the real estate industry including roles, activities and players in the industry; basic legal aspects of ownership and various contracts; and the valuation of various real estate assets and debt instruments.

ACFM 310. Independent Study. .25-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Individual study or projects, supervised by instructor. Prerequisite: permission of the instructor.

ACFM 311. Teaching Assistant in Accounting & Financial Management. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:3,Other:1; Repeatable
Teaching assistant in an accounting or finance class, supervised by the instructor. Prerequisite: permission of the instructor.

ACFM 314. Special Topics in Accounting & Financial Management (.5 course credit). .5 Credits.
Offered Either Fall or Spring; Lecture hours:2; Repeatable
Topic is specific to the semester offered. Course description will be provided prior to registration. Identical course topic may not be repeated if taken in a previous semester under a different course subject prefix. Prerequisites, if any, will be established by instructor each semester.

ACFM 315. Special Topics in Accounting and Financial Management. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:Varies; Repeatable
A seminar on selected topics in accounting and financial management. Prerequisite: permission of the instructor.

ACFM 321. Intermediate Financial Accounting I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Accounting theory and practice applicable to income determination and asset valuation. This course develops students' understanding of the accounting and financial reporting environment. Prerequisite: ACFM 204.

ACFM 322. Intermediate Financial Accounting II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A continuation of ACFM 321. Topics include: investments, debt, leases, pensions, deferred taxes, EPS, equity, and cash flows. Prerequisite: ACFM 321.

ACFM 323. Advanced Financial Accounting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Accounting theory and practice applicable to business combinations and additional advanced topics related to financial reporting. Prerequisite: ACFM 322 or concurrent enrollment.

ACFM 324. Individual Federal Income Taxes. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Survey of federal income taxes with emphasis on individual tax law, practice and planning. Prerequisite: ACFM 104. No first-years.

ACFM 325. Corporate, Partnership, Gift & Estate Taxes. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Advanced topics in federal income, gift and estate taxation, with primary emphasis on corporate and pass-through entity tax law, practice and planning. Prerequisite: ACFM 324.

ACFM 326. Managerial & Cost Accounting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Examines managerial accounting and cost behavior, specifically, how product cost information is recorded, reported, analyzed and used by managers in decision making. Includes preparation and analysis of operating budgets and capital budgets. Prerequisite: ACFM 204.

ACFM 327. Auditing & Assurance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This course helps students develop a strong foundation for quality professional judgments to support the practice of auditing by examining professional and ethical standards and understanding the audit process. Prerequisites: ACFM 321 and ACFM 329 or concurrent enrollment. Junior/Senior only.

ACFM 328. Topics in Accounting. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration.

ACFM 329. Accounting Information and Analytics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Students will learn how accounting information is stored in databases and how to retrieve and process that information using analytical techniques to provide useful information for decision-making. Prerequisites: ACFM 204 and ANOP 102.

ACFM 330. Managerial Accounting and Quantitative Decision Making. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
An emphasis on how managers apply statistical modeling, forecasting, data visualization and operations research techniques to the analysis of business operations and performance using internal accounting data. Prerequisites: ACFM 329 or concurrent enrollment.

ACFM 335. Negotiations & Conflict Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will teach students how to prepare for negotiations and address conflicts. This includes learning negotiation strategies in theory and applying them in simulations. The course will give students the tools to increase their chances of success in negotiations. No first-years.

ACFM 361. Financial Statement Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will learn to read, analyze, and interpret financial disclosures at a more sophisticated level, and learn statement analysis to make judgments about the quality of reported earnings, to forecast future results and, ultimately, to value companies. Prerequisites: ACFM 203 and ACFM 204.

ACFM 362. Investments. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Principles of investment practice and theory. Emphasis on the fundamentals of intangible investments (equities, debt and derivative instruments). Prerequisites: ACFM 203, ACFM 361 or concurrent enrollment and ANOP 102 and (PSYC 215 or MATH 192 or MATH 201 or MATH 216) or permission of the instructor.

ACFM 363. Topics in Financial Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration. Prerequisites, if any, will be set by the instructor.

ACFM 364. Topics in Financial Markets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration. Prerequisites, if any, will be set by the instructor of each course.

ACFM 366. Topics in Real Estate. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course description at the time of registration. Prerequisites, if any, will be set by the instructor.

ACFM 367. The Global Flow of Capital. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore the challenges of financial management in a global context. Prerequisite: ACFM 203 or permission of the instructor.

ACFM 368. Affordable Housing: Policy and Practice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will provide an overview of the myriad and complex issues faced by housing practitioners and policy analysts in their collective struggle to secure a decent, affordable home for all.

ACFM 369. Real Estate Finance & Investments. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the key concepts and strategies in real estate financing and investment. Students will learn about the sources and types of finance for real estate transactions and the underwriting process. They will be introduced to investment analysis, after-tax assessment and the application of computer models to investment decisions. Prerequisite: ACFM 266.

ACFM 370. Fixed Income. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an understanding of different fixed income offerings: government/municipal/corporate bonds, and MBS. Students will understand the relationship between the price, measures of return and measures of risk of a bond. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 371. Financial Planning. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides a personal financial planning overview including: financial planning process, CFP Board's code of ethics, budgeting, personal income tax planning, managing credit/debt, risk management/insurance, investing to achieve goals and creating a financial plan for clients. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 372. Advanced Corporate Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students integrate principles and strategies from accounting, statistics, finance, and economics to understand complex financial topics including mergers/acquisitions, valuation, financing, risk management, and corporate governance. Students draw from psychology, history, economics, and other disciplines to understand/model the behavior of financial markets. Prerequisites: ACFM 203 and ACFM 361 or concurrent enrollment and (MATH 192 or MATH 201 or MATH 216).

ACFM 373. Risk & Portfolio Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course analyzes the difference between risk and uncertainty, its quantification, and how to manage them through the creation of a portfolio. Risk, return, and practical portfolio applications will be analyzed, in particular, mutual funds, ETFs, REITs, (C)MBS, and CDOs. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 374. Quantitative Investment Strategies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores quantitative investment strategies used by hedge funds. Students learn to use python and data science techniques to backtest and implement several of the most successful investment strategies. The course also covers issues related to performance measurement, transaction costs, risk management and portfolio construction. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216). Junior/Senior only.

ACFM 375. Student Managed Investment Fund I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This is a two-semester portfolio management course in which students manage a real dollar investment portfolio. ACFM 375 (SMIF I) and ACFM 476 (SMIF II) may be taken in any order, but both must be completed in order to receive course credit. Prerequisites: ACFM 362 and permission of the instructor. Only open to juniors/seniors and 4th year of 5-year engineers.

ACFM 378. Investment Banking. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an introduction to the world of investment banking. Students will gain a solid understanding of the key roles and responsibilities of investment bankers in facilitating corporate finance and asset management activities. Prerequisite: ACFM 362 or concurrent enrollment. Only open to juniors, seniors and 4th year of 5-Year engineers.

ACFM 381. Derivatives. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on the use of derivative securities, particularly listed stock and index options, to shape the risk and return characteristics of a well-diversified portfolio. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216).

ACFM 382. Behavioral Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the role of psychology in understanding many fundamental topics in finance. Topics include psychological foundations of behavioral finance, stock return anomalies and behavioral corporate finance. The course also includes a final project in which students develop and test a novel investment strategy. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216). Open to juniors/seniors.

ACFM 383. Entrepreneurial Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on financial decisions faced by new ventures, considering the viewpoints of both entrepreneurs and venture capitalists. Topics include opportunity identification, business valuation, financing methods/strategy, venture capital, compensating/attracting employees and exit (harvest). Financing methods covered include traditional routes as well as newer ones such as crowdfunding and ICO. Prerequisite: ACFM 104. Only open to juniors and seniors.

ACFM 384. Fundamentals of ESG Investing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will provide an introduction to sustainable investing and will explore what is meant by ESG (environmental, social, governance). We will consider the different ways to integrate ESG factors into the investment process within the three main investment types: debt, equity and real estate. Not first-years.

ACFM 391. History of the Securities Markets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Traces how the United States has become an "equity nation" where most citizens own common stock. Also explores pivotal moments in stock market history. Only open to juniors and seniors.

ACFM 400. Honors Course in Accounting & Financial Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Special and independent studies for Accounting and Financial Management majors selected under guidelines of the College and the University Honors Council. Honors thesis required. Prerequisites: nomination by the College and permission of the instructor.

ACFM 420. Accounting Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An integrative seminar usually offered once each academic year. Can fulfill culminating experience requirement for ACFM-CPA track majors. The course may include: SEC regulation, financial analysis, probability and statistics, macroeconomics, managerial finance, personal finance and behavioral aspects of accounting. Prerequisites: ACFM 203 and ACFM 322. Only open to seniors and accounting and finance majors.

ACFM 476. Student Managed Investment Fund II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This is a two-semester portfolio management course in which students manage a real dollar investment portfolio. ACFM 375 (SMIF I) and ACFM 476 (SMIF II) may be taken in any order, but both must be completed in order to receive course credit. Prerequisites: ACFM 362 and permission of the instructor. Open to juniors, seniors and 4th year of 5-year engineers.

Finance

Faculty

Professors: Raquel Meyer Alexander, Sandy Bond (Practice), Janice M. Traflet

Associate Professors: Tom G. Geurts, David E. Jensen, Stacy Mastrolia (Chair), Curtis Nicholls, Ankur Pareek, Frank Schreiner (Practice), Kate Suslava

Assistant Professors: Kylie (Seward) Aikey (Practice), Vaska Atta-Darkua, Amber Lawson (Practice), James G. Lawson, Karen Mitchell McGrath, Julie Mercado, Vernan Rivera, Ryan Stauffer, Daniel A. Street

Finance majors will experience the best of theoretical, applied, technical and behavioral finance across a broad range of courses. The foundation of their knowledge will be built in core finance and accounting classes, after which they will choose from a range of electives, including courses in the practical application of derivatives, behavioral finance, ESG investing, financial statement analysis, entrepreneurial finance and global finance. Students can also enroll in additional accounting, economics and math courses to support their finance curriculum. Finance majors will also draw upon everything an excellent liberal arts university has to offer in applying a critical lens to solving questions of capital deployment. Students also receive first-hand experience with company finance via the Freeman College of Management's MGMT 101 course.

Students will have access to modern finance tools including CapIQ and Bloomberg terminals housed in the world-class Moriarty Investment Lab. Students have the opportunity to participate in competitions, such as the CFA Institute Research Challenge and the Bloomberg Investment Challenge, and can apply to join the Student Managed Investment Fund, a two-semester course managing a portion of the University's endowment in which student analysts make all portfolio decisions.

More than 40 percent of students in finance study abroad during summer programs hosted by the Freeman College of Management or traditional semester-long study abroad experiences. Finance majors begin their careers at many commercial and investment banks as well as asset management, wealth management, consulting, boutique investment and private equity firms, and in corporate finance departments. Students also find positions at Fortune 500 companies and others attend graduate school.

Real Estate Minor

Students who wish to minor in real estate will encounter various disciplines involving the planning, development, appraisal, and management and financing of tangible assets. This course of study first provides a foundation in real estate and then allows students to choose courses that align with their particular area of interest.

Finance Major Requirements

Finance majors must take the following six courses:

ACFM 201	Business Law	1
ACFM 204	Foundations of Accounting II	1
ACFM 361	Financial Statement Analysis	1
ACFM 362	Investments	1
ACFM 372	Advanced Corporate Finance	1
ANOP 203	Introduction to Programming for Business Analytics	1
or ANOP 302	Financial Decision Modeling using Spreadsheets	
CE Requirement		
ACFM 476	Student Managed Investment Fund II	1
or ACFM 363	Topics in Financial Management	
or ACFM 367	The Global Flow of Capital	
or ACFM 378	Investment Banking	
or ACFM 381	Derivatives	
or ACFM 382	Behavioral Finance	

Select two courses from the list of electives. A maximum of one elective may be satisfied by transfer credit:

ACFM 324	Individual Federal Income Taxes	1
ACFM 325	Corporate, Partnership, Gift & Estate Taxes	1
ACFM 335	Negotiations and Conflict Management	1
ACFM 363	Topics in Financial Management	1
ACFM 367	The Global Flow of Capital	1
ACFM 369	Real Estate Finance & Investments	1
ACFM 378	Investment Banking	1
ACFM 381	Derivatives	1
ACFM 382	Behavioral Finance	1
ACFM 383	Entrepreneurial Finance	1
ACFM 384	Fundamentals of ESG Investing	1
ACFM 391	History of the Securities Markets	1
ACFM 476	Student Managed Investment Fund II	1

Culminating Experience

All BSBA majors must satisfy the Culminating Experience component of the Freeman College of Management General Education Curriculum by taking a course designated as such **on campus** no earlier than the second semester of the junior year.

Finance majors fulfill this requirement by successfully completing one of the following: ACFM 363 Topics in Financial Management, ACFM 367 The Global Flow of Capital, ACFM 378 Investment Banking, ACFM 381 Derivatives, ACFM 382 Behavioral Finance or ACFM 476 Student Managed Investment Fund II. In most cases, students will take more than one of these courses to satisfy major/degree requirements.

First Year

	Credits	First Semester	Credits	Second Semester	Credits
ANOP 102		1 MGMT 100		.5 ACFM 104	1
ECON 101		1		MGMT 101 (Should not double with lab science)	1
MATH 192, 201, or 216		1			
		3		**0.5**	**2**

Sophomore

	Credits	First Semester	Credits	Second Semester	Credits
ANOP 202[So/Jr]		1 ACFM 203		1 ACFM 361	1
ANOP 203 or 302[So/Jr]		1 ACFM 204		1 ACFM 362	1
		MIDE 201		1	
		2		**3**	**2**

Junior

	Credits	First Semester	Credits		
ACFM 201		1 ACFM 372		1	
MGMT 303 or MORS 302[Jr/Sr]		1			
		2		**1**	

Senior

	Credits	
2 elective courses from the list below		2
ACFM 324		
ACFM 325		
ACFM 335		
ACFM 363[CE]		
ACFM 367[CE]		
ACFM 369		
ACFM 378[CE]		
ACFM 381[CE]		
ACFM 382[CE]		
ACFM 383		
ACFM 384		
ACFM 391		
ACFM 476[CE]		
		2

Total Credits: 17.5

CE Qualifies for Culminating Experience if taken spring of junior/senior year.
So/Jr Can be taken sophomore or junior year.
Jr/Sr Can be taken junior or senior year.

Real Estate Minor

Cities today must adapt to grand challenges such as climate change, rapid technological evolution and economic uncertainty. At the center of those solutions are the real estate professionals who shape the environments in which we live, work and play.

The minor in real estate requires completion of five classes, as follows.

Two core courses:

ACFM 266	Principles of Real Estate	1
ACFM 369	Real Estate Finance & Investments	1

Select three courses from the list of electives. A maximum of two electives may be satisfied by transfer credit:

ACFM 201	Business Law	1
ACFM 335	Negotiations and Conflict Management	1
ACFM 366	Topics in Real Estate	1
ACFM 368	Affordable Housing: Policy and Practice	1
ACFM 383	Entrepreneurial Finance	1
ACFM 384	Fundamentals of ESG Investing	1
ANOP 270	Data Visualization for Business Analytics	1
MIDE 201	Marketing	1
MIDE 300	Markets, Innovation, and Design	1
MIDE 302	Design Realization	1
MORS 201	Organizational Forms, Strategy and Structure	1
MORS 240	Entrepreneurship	1
UNIV 225	Introduction to Public Policy	1

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Analysis

- Students will demonstrate the ability to understand organizations and analyze them rigorously.

Integrity

- Students will possess the judgment, vision and integrity necessary to serve society and their professions.

Morality

- Students will identify creative and morally responsible solutions to organizational and societal issues.

Beyond these Freeman College learning goals, graduates of the Accounting & Financial Management program will complete a curriculum designed to develop the critical thinking, technical, problem-solving, communication and interpersonal skills necessary to achieve the highest level of success in accounting and financial management careers. Specific educational objectives of our program of study include:

- Enhance students' communication skills.
- Facilitate development of effective interpersonal and leadership skills.
- Adequately prepare students seeking professional certifications.
- Exercise and hone students' analytical skills.
- Enhance students' awareness and use of information technology and systems.
- Heighten each student's understanding of the global infrastructure of today's business operations.
- Raise student awareness of the ethical ramifications of business transactions.
- Impress upon students that a market-based economic system cannot function without citizens' ability to understand accounting and financial information.

To accomplish our goals, we moved the curriculum away from a traditional rules-based financial statement preparation approach and focus more on the concepts underlying financial reporting and financial management. This move improves financial literacy and provides an opportunity for our students to investigate specialized fields of accounting and finance (e.g., public accounting, corporate accounting and finance, investments,

investment and commercial banking, etc.). Our approach emphasizes activities that require students to analyze information and communicate their conclusions, thus developing their decision-making abilities and professional judgment.

Courses

ACFM 104. Foundations of Accounting I. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
Introduction to accounting and financial management including financial statement preparation and analysis, cost relationships, time value of money and capital budgeting.

ACFM 150. Finance Speaker Series. .5 Credits.
Offered Both Fall and Spring; Lecture hours:1,Other:1
The Finance Speaker Series provides students, early in their college careers, a comprehensive view of the opportunities in the financial services industry. Students will meet and engage with professionals that have invaluable knowledge/experience in investment management, private equity, wealth management, venture capital, accounting, corporate finance and entrepreneurial endeavors. Repeatable once.

ACFM 201. Business Law. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to business law. Topics include contracts, the Uniform Commercial Code, agency and business structures. No first-years.

ACFM 202. Business Law II. .5 Credits.
Offered Either Fall or Spring; Lecture hours:2
This course will provide an overview of, at a minimum: property- real, personal and intellectual; crimes related to business; intentional torts and product liability; government regulation, including antitrust and consumer protection; an introduction to trusts and estates; and environmental protection. Prerequisite: ACFM 201. No first-years.

ACFM 203. Corporate Finance. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Concepts, principles, and recent innovations in corporate finance: risk and return, valuation, capital budgeting and structure, dividend policy, financial planning, risk management. Prerequisites: ACFM 104.

ACFM 204. Foundations of Accounting II. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
Covers general purpose financial statements, the theoretical framework that underlies the measurement of income, and asset and liability valuation. Prerequisite: ACFM 104.

ACFM 205. Personal Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course is open to all students from all colleges with no prerequisites. It follows a very practical approach to help students understand their finances and to feel confident making decisions about budgeting and taxes, saving and investing, managing debt and credit, and purchasing insurance (e.g., health, auto, disability, life). No accounting or finance majors.

ACFM 266. Principles of Real Estate. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This class will provide an overview of the real estate industry including roles, activities and players in the industry; basic legal aspects of ownership and various contracts; and the valuation of various real estate assets and debt instruments.

ACFM 310. Independent Study. .25-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Individual study or projects, supervised by instructor. Prerequisite: permission of the instructor.

ACFM 311. Teaching Assistant in Accounting & Financial Management. .5-1 Credits.
Offered Both Fall and Spring; Lecture hours:3,Other:1; Repeatable
Teaching assistant in an accounting or finance class, supervised by the instructor. Prerequisite: permission of the instructor.

ACFM 314. Special Topics in Accounting & Financial Management (.5 course credit). .5 Credits.
Offered Either Fall or Spring; Lecture hours:2; Repeatable
Topic is specific to the semester offered. Course description will be provided prior to registration. Identical course topic may not be repeated if taken in a previous semester under a different course subject prefix. Prerequisites, if any, will be established by instructor each semester.

ACFM 315. Special Topics in Accounting and Financial Management. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:Varies; Repeatable
A seminar on selected topics in accounting and financial management. Prerequisite: permission of the instructor.

ACFM 321. Intermediate Financial Accounting I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Accounting theory and practice applicable to income determination and asset valuation. This course develops students' understanding of the accounting and financial reporting environment. Prerequisite: ACFM 204.

ACFM 322. Intermediate Financial Accounting II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A continuation of ACFM 321. Topics include: investments, debt, leases, pensions, deferred taxes, EPS, equity, and cash flows. Prerequisite: ACFM 321.

ACFM 323. Advanced Financial Accounting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Accounting theory and practice applicable to business combinations and additional advanced topics related to financial reporting. Prerequisite: ACFM 322 or concurrent enrollment.

ACFM 324. Individual Federal Income Taxes. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Survey of federal income taxes with emphasis on individual tax law, practice and planning. Prerequisite: ACFM 104. No first-years.

ACFM 325. Corporate, Partnership, Gift & Estate Taxes. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Advanced topics in federal income, gift and estate taxation, with primary emphasis on corporate and pass-through entity tax law, practice and planning. Prerequisite: ACFM 324.

ACFM 326. Managerial & Cost Accounting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Examines managerial accounting and cost behavior, specifically, how product cost information is recorded, reported, analyzed and used by managers in decision making. Includes preparation and analysis of operating budgets and capital budgets. Prerequisite: ACFM 204.

ACFM 327. Auditing & Assurance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This course helps students develop a strong foundation for quality professional judgments to support the practice of auditing by examining professional and ethical standards and understanding the audit process. Prerequisites: ACFM 321 and ACFM 329 or concurrent enrollment. Junior/Senior only.

ACFM 328. Topics in Accounting. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration.

ACFM 329. Accounting Information and Analytics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
Students will learn how accounting information is stored in databases and how to retrieve and process that information using analytical techniques to provide useful information for decision-making. Prerequisites: ACFM 204 and ANOP 102.

ACFM 330. Managerial Accounting and Quantitative Decision Making. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
An emphasis on how managers apply statistical modeling, forecasting, data visualization and operations research techniques to the analysis of business operations and performance using internal accounting data. Prerequisites: ACFM 329 or concurrent enrollment.

ACFM 335. Negotiations & Conflict Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will teach students how to prepare for negotiations and address conflicts. This includes learning negotiation strategies in theory and applying them in simulations. The course will give students the tools to increase their chances of success in negotiations. No first-years.

ACFM 361. Financial Statement Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students will learn to read, analyze, and interpret financial disclosures at a more sophisticated level, and learn statement analysis to make judgments about the quality of reported earnings, to forecast future results and, ultimately, to value companies. Prerequisites: ACFM 203 and ACFM 204.

ACFM 362. Investments. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Principles of investment practice and theory. Emphasis on the fundamentals of intangible investments (equities, debt and derivative instruments). Prerequisites: ACFM 203, ACFM 361 or concurrent enrollment and ANOP 102 and (PSYC 215 or MATH 192 or MATH 201 or MATH 216) or permission of the instructor.

ACFM 363. Topics in Financial Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration. Prerequisites, if any, will be set by the instructor.

ACFM 364. Topics in Financial Markets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course guide at the time of registration. Prerequisites, if any, will be set by the instructor of each course.

ACFM 366. Topics in Real Estate. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic for this course is specific to the semester the course is offered and will be listed in the course description at the time of registration. Prerequisites, if any, will be set by the instructor.

ACFM 367. The Global Flow of Capital. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will explore the challenges of financial management in a global context. Prerequisite: ACFM 203 or permission of the instructor.

ACFM 368. Affordable Housing: Policy and Practice. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will provide an overview of the myriad and complex issues faced by housing practitioners and policy analysts in their collective struggle to secure a decent, affordable home for all.

ACFM 369. Real Estate Finance & Investments. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the key concepts and strategies in real estate financing and investment. Students will learn about the sources and types of finance for real estate transactions and the underwriting process. They will be introduced to investment analysis, after-tax assessment and the application of computer models to investment decisions. Prerequisite: ACFM 266.

ACFM 370. Fixed Income. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an understanding of different fixed income offerings: government/municipal/corporate bonds, and MBS. Students will understand the relationship between the price, measures of return and measures of risk of a bond. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 371. Financial Planning. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides a personal financial planning overview including: financial planning process, CFP Board's code of ethics, budgeting, personal income tax planning, managing credit/debt, risk management/insurance, investing to achieve goals and creating a financial plan for clients. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 372. Advanced Corporate Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Students integrate principles and strategies from accounting, statistics, finance, and economics to understand complex financial topics including mergers/acquisitions, valuation, financing, risk management, and corporate governance. Students draw from psychology, history, economics, and other disciplines to understand/model the behavior of financial markets. Prerequisites: ACFM 203 and ACFM 361 or concurrent enrollment and (MATH 192 or MATH 201 or MATH 216).

ACFM 373. Risk & Portfolio Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course analyzes the difference between risk and uncertainty, its quantification, and how to manage them through the creation of a portfolio. Risk, return, and practical portfolio applications will be analyzed, in particular, mutual funds, ETFs, REITs, (C)MBS, and CDOs. Prerequisite: ACFM 203. Junior/Senior only.

ACFM 374. Quantitative Investment Strategies. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores quantitative investment strategies used by hedge funds. Students learn to use python and data science techniques to backtest and implement several of the most successful investment strategies. The course also covers issues related to performance measurement, transaction costs, risk management and portfolio construction. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216). Junior/Senior only.

ACFM 375. Student Managed Investment Fund I. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This is a two-semester portfolio management course in which students manage a real dollar investment portfolio. ACFM 375 (SMIF I) and ACFM 476 (SMIF II) may be taken in any order, but both must be completed in order to receive course credit. Prerequisites: ACFM 362 and permission of the instructor. Only open to juniors/seniors and 4th year of 5-year engineers.

ACFM 378. Investment Banking. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an introduction to the world of investment banking. Students will gain a solid understanding of the key roles and responsibilities of investment bankers in facilitating corporate finance and asset management activities. Prerequisite: ACFM 362 or concurrent enrollment. Only open to juniors, seniors and 4th year of 5-Year engineers.

ACFM 381. Derivatives. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on the use of derivative securities, particularly listed stock and index options, to shape the risk and return characteristics of a well-diversified portfolio. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216).

ACFM 382. Behavioral Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course explores the role of psychology in understanding many fundamental topics in finance. Topics include psychological foundations of behavioral finance, stock return anomalies and behavioral corporate finance. The course also includes a final project in which students develop and test a novel investment strategy. Prerequisites: ACFM 203 and (MATH 192 or MATH 201 or MATH 216). Open to juniors/seniors.

ACFM 383. Entrepreneurial Finance. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on financial decisions faced by new ventures, considering the viewpoints of both entrepreneurs and venture capitalists. Topics include opportunity identification, business valuation, financing methods/strategy, venture capital, compensating/attracting employees and exit (harvest). Financing methods covered include traditional routes as well as newer ones such as crowdfunding and ICO. Prerequisite: ACFM 104. Only open to juniors and seniors.

ACFM 384. Fundamentals of ESG Investing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will provide an introduction to sustainable investing and will explore what is meant by ESG (environmental, social, governance). We will consider the different ways to integrate ESG factors into the investment process within the three main investment types: debt, equity and real estate. Not first-years.

ACFM 391. History of the Securities Markets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Traces how the United States has become an "equity nation" where most citizens own common stock. Also explores pivotal moments in stock market history. Only open to juniors and seniors.

ACFM 400. Honors Course in Accounting & Financial Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
Special and independent studies for Accounting and Financial Management majors selected under guidelines of the College and the University Honors Council. Honors thesis required. Prerequisites: nomination by the College and permission of the instructor.

ACFM 420. Accounting Seminar. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An integrative seminar usually offered once each academic year. Can fulfill culminating experience requirement for ACFM-CPA track majors. The course may include: SEC regulation, financial analysis, probability and statistics, macroeconomics, managerial finance, personal finance and behavioral aspects of accounting. Prerequisites: ACFM 203 and ACFM 322. Only open to seniors and accounting and finance majors.

ACFM 476. Student Managed Investment Fund II. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3,Other:1
This is a two-semester portfolio management course in which students manage a real dollar investment portfolio. ACFM 375 (SMIF I) and ACFM 476 (SMIF II) may be taken in any order, but both must be completed in order to receive course credit. Prerequisites: ACFM 362 and permission of the instructor. Open to juniors, seniors and 4th year of 5-year engineers.

Bachelor of Management for Engineers

The Bachelor of Management for Engineers (BME) degree is open to students admitted to the five-year joint degree program in engineering and management. The program leads to a joint degree comprising the Bachelor of Management for Engineers degree and the Bachelor of Science degree in one of the specific engineering disciplines.

Major Requirements

All BME majors must fulfill all University degree requirements, including the Freeman College of Management General Education Curriculum (p. 403), and must take the following combination of six required and two elective courses:

BME Core Requirements

MGMT 101	Introduction to Organization and Management	1
ACFM 104	Foundations of Accounting I	1
MIDE 201	Marketing	1
MORS 201	Organizational Forms, Strategy and Structure	1
ACFM 203	Corporate Finance	1
MORS 302	Responsible Management	1
or MGMT 303	Technological Dystopia	

BME Electives

Beyond the BME core requirements, all BME majors must take **two** Freeman College of Management elective courses chosen from MGMT, ACFM, ANOP, MIDE, and/or MORS course offerings – one at the 200 or 300 level and the other at the 300 level.

Students in this program may satisfy one of their eight Freeman College of Management courses through transfer of credit from a non-Bucknell program with prior approval of the College of Management. Suggested course sequences for the program and detailed information on the degree requirements are available from the Freeman College of Management or the Office of the Dean of Engineering.

Culminating Experience

BME majors fulfill the Culminating Experience requirement by completing either MORS 302 Responsible Management or MGMT 303 Technological Dystopia.

Courses

MGMT 100. Exploring Management. .5 Credits.
Offered Fall Semester Only; Lecture hours:1,Recitation:1
This half-credit course is designed to help first year students integrate into college life, build community with campus stakeholders, educate students on how management and organizations can be forces for the common good, and help students learn about future paths of purpose.

MGMT 101. Introduction to Organization and Management. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:3
Each section learns management theories, concepts, and models, putting them into practice by designing and managing their own multi-divisional hybrid organizations that conduct major service projects funded by selling business products they created. Storytelling and writing are key pedagogies. Not open to first semester first-year students.

MGMT 1NT. Management Non-Traditional Study Internship Credit. .25 Credits.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3; Repeatable
Quarter credit for unpaid internship experiences. Requires submission of proposal to the Assistant Dean and approval of proposal prior to enrollment. May repeat only once for a total of .5 credit. Prerequisite: permission of the Assistant Dean.

MGMT 215. Topics in Management. .5 Credits.
Offered Either Fall or Spring; Lecture hours:3; Repeatable
Topic is specific to the semester offered. Course description will be available prior to registration.

MGMT 290. Management in a Global, Societal and Cultural Context. 1 Credit.
Offered Summer Session Only; Lecture hours:3; Repeatable
This study abroad course examines the intersection between management, globalization, society, and culture. Topics may vary from session to session and across locations.

MGMT 2NT. Management Non-traditional Study. 1 Credit.
Offered Fall, Spring, Summer; Lecture hours:Varies,Other:3; Repeatable
A non-traditional study project arranged with an instructor and approved by the department or program chair and academic dean. Prerequisite: permission of the instructor.

MGMT 303. Technological Dystopia. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
Organizations solve a variety of problems by deploying information systems. This course explores a range of technological impacts on organizations from their behavior to survival.

MGMT 310. Independent Study in Management. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Individual study or projects, supervised by instructor. Prerequisite: permission of the instructor.

MGMT 311. Undergraduate Research in Management. .5-2 Credits.
Offered Occasionally; Lecture hours:Varies,Other:1; Repeatable
Prior to registering for this course, the student should identify a particular research project they are interested in pursuing and a particular professor to supervise that project. The supervising professor must give permission for the student to register for this course.

MGMT 314. Advanced Topics in Management (.5 course credit). .5 Credits.
Offered Either Fall or Spring; Lecture hours:2; Repeatable
Topic is specific to the semester offered. Course description will be provided prior to registration. Prerequisites, if any, will be established by instructor each semester.

MGMT 385. Internship in Management and Technology. .5 Credits.
Offered Summer Session Only; Lecture hours:1.5
Internship in complex management challenges, the integral role of technology in organizations, and interdisciplinary decision making. Open only to students admitted to the Institute for Leadership in Technology and Management. Prerequisites: MGMT 285 and permission of the instructor. Crosslisted as ENGR 385.

MGMT 390. Honors Course in Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Special and independent studies for BSBA students selected under guidelines of the school and the University Honors Council. Honors thesis required. Prerequisites: nomination by the school and permission of the instructor.

MGMT 3NT. Management Non-traditional Study. 1-4 Credits.
Offered Fall Semester Only; Lecture hours:Varies,Other:Varies; Repeatable
Non-traditional Study in management.

MGMT 404. Honors Strategy Seminar. 1 Credit.
Offered Occasionally; Lecture hours:3
An intensive honors seminar in the subject of strategy from its historical origins to its modern day application in business and government. Prerequisites: MGMT 101 and permission of the instructor. Only open to BSBA or MGEG seniors.

Business Analytics

Faculty

Professors: Matthew D. Bailey (Chair), Mihai Banciu (Associate Dean of Faculty for the Freeman College of Management)

Associate Professors: Jimmy Chen, Alia C. Stanciu, Joseph Wilck (Practice)

Assistant Professors: Joyaditya Laik, James Paine

Visiting Assistant Professor: Yao Chen

Organizations of all types increasingly rely on data and analytics to inform their decision-making processes. To this end, both for-profit and not-for-profit organizations must have the ability to transform data into information. Business analytics is the scientific process of transforming data or quantitative models into actionable insight to improve decision-making. Business analytics rests on three broad functional pillars: descriptive, predictive and prescriptive analytics.

- Descriptive analytics prepares, displays and analyzes historical data; it identifies data patterns to report trends.
- Predictive analytics forecasts future probabilities and trends, and determines relationships in data that may not be readily apparent with descriptive analysis.
- Prescriptive analytics evaluates and determines new ways to operate based upon meeting certain objectives while balancing operational constraints.

This modeling and analysis cannot be done in isolation. Across the curriculum, we will address and investigate the ethical implications of both the intended and unintended use of our analysis. The business analytics major allows students with an interest in quantitative analysis (broadly defined) to further explore their interests in an organizational context, to appreciate the inherent broad social and ethical issues within the field, and to become effective managers in any data-driven organization. The major provides our graduates the necessary analytical and communication skills built upon a broad management education to address challenges in the 21st century.

Business analytics majors are also eligible to pursue a BA in Data Science (p. 92) as a co-major. Complementing the depth a student receives from their business analytics major, the BA in data science provides breadth across the interdisciplinary field of data science. The co-major is not intended as – nor may it be declared as – a stand-alone course of study.

In the spring of their sophomore year, all BSBA students will, in consultation with their advisers, select a major in one of the Freeman College of Management departments and will complete the specific major requirements in addition to the Freeman College core curriculum requirements (p. 404).

Business Analytics Requirements

Beyond completion of the Freeman College core requirements (p. 404), all business analytics majors must take the following courses:

Business Analytics Core Requirements

MATH 201	Calculus I	1
or MATH 192	Topics in Calculus	

MATH 216	Statistics I	1
ANOP 203	Introduction to Programming for Business Analytics	1
or CSCI 203	Introduction to Computer Science	

Business Analytics Major Requirements

ANOP 270	Data Visualization for Business Analytics	1
or HUMN 270	Data Visualization for the Digital Humanities	
ANOP 330	Predictive Analytics: Machine Learning Fundamentals for Business	1
ANOP 350	Predictive Analytics: Forecasting & Simulation	1
ANOP 370	Prescriptive Analytics: Decision Modeling & Optimization	1
or MATH 358	Topics in Operations Research	
ANOP 400	Business Analytics Practicum	1

Culminating Experience

All BSBA majors must satisfy the Culminating Experience component of the Freeman College of Management General Education Curriculum by taking a course designated as such ***on campus*** no earlier than the second semester of the junior year. Business analytics majors will fulfill this by taking ANOP 400 Business Analytics Practicum.

Analytics & Operations Management Suggested Plan of Study

Below is a general guide for when to take the courses that count toward the Freeman College Core and your major requirements. Suggested term(s) of study are denoted in parenthesis. These are just a general guide. Other sequences are possible. Consult the Bucknell course schedule for course availability in each semester. Refer to your catalog year for specific information about your major and related prerequisites.

Abbreviation Key:		
FY = First Year		
SO = Sophomore Year		
JR = Junior Year		
SR = Senior Year		
FREEMAN CORE COURSES = 8.5 credits		
ANOP 102	Spreadsheet Modeling & Data Analysis (FY either semester)	1
ECON 101	Economic Principles/Problems (FY either semester)	1
MGMT 100	Exploring Management (FY first semester)	.5
MGMT 101	Introduction to Organization and Management (FY second semester or SO first semester) # w	1
ACFM 104	Foundations of Accounting I (SO either semester)	1
ACFM 203	Corporate Finance (SO or JR either semester) p	1
ANOP 202	Operations Management (SO either semester) p	1
MIDE 201	Marketing (SO or JR either semester)	1
MORS 302	Responsible Management p	1
or MGMT 303	Technological Dystopia	
(either may be taken JR second semester, SR either semester)		
BUSINESS ANALYTICS CORE REQUIREMENTS = 8 credits		
MATH 201	Calculus I	1
or MATH 192	Topics in Calculus	
(either may be taken FY either semester)		
MATH 216	Statistics I (SO first semester)	1
ANOP 203	Introduction to Programming for Business Analytics	1
or CSCI 203	Introduction to Computer Science	
(either may be taken FY second semester or SO first semester)		
ANOP 270	Data Visualization for Business Analytics p	1
or HUMN 270	Data Visualization for the Digital Humanities	
(either may be taken FY second semester or SO either semester)		
ANOP 330	Predictive Analytics: Machine Learning Fundamentals for Business (SO second semester or JR either semester) p	1

ANOP 350	Predictive Analytics: Forecasting & Simulation (JR either semester or SR first semester) [p]	1
ANOP 370	Prescriptive Analytics: Decision Modeling & Optimization [p]	1
or MATH 358	Topics in Operations Research	
(either may be taken Junior first semester or SR first semester)		
ANOP 400	Business Analytics Practicum (JR second semester, SR either semester) [CE p]	1

Lab science should be taken before the end of the sophomore year. **Strongly recommend lab science not be taken in the semester in which you are enrolled in MGMT 101.**
w Satisfies W2 requirement.
p Consult the catalog for the prerequisite required for this course.
CE Qualifies for the culminating experience if taken spring of junior year or either semester of senior year.

Data Science Co-major

Students pursuing a BSBA in business analytics are eligible to pursue a BA in Data Science (p. 92) as a co-major. Complementing the depth a student receives from their business analytics major, the BA in data science provides breadth across the interdisciplinary field of data science. The co-major is not intended as – nor can it be declared as – a stand-alone course of study.

Business Analytics Minor

The business analytics minor provides students with the opportunity to complement their major field of study with a foundation in descriptive, predictive and prescriptive analytics.

The business analytics minor consists of three required courses and two electives for a total of five courses, as follows[1]:

Required courses:		
ANOP 102	Spreadsheet Modeling & Data Analysis	1
ANOP 270	Data Visualization for Business Analytics	1
ANOP 330	Predictive Analytics: Machine Learning Fundamentals for Business	1
Two courses from the following list:		2
ANOP 203	Introduction to Programming for Business Analytics	
ANOP 242	Database Management and Applied Data Analysis	
ANOP 302	Financial Decision Modeling using Spreadsheets	
ANOP 311	Supply Chain Analytics	
ANOP 350	Predictive Analytics: Forecasting & Simulation	
ANOP 370	Prescriptive Analytics: Decision Modeling & Optimization	

1 Other ANOP courses (excluding ANOP 202 and ANOP 301) may be considered with approval by the ANOP department chair.

Drawing upon their professional and liberal education, Freeman College of Management students will be able to collaboratively create positive societal impacts through:

Analysis

- Students will demonstrate the ability to understand organizations and analyze them rigorously.

Integrity

- Students will possess the judgment, vision and integrity necessary to serve society and their professions.

Morality

- Students will identify creative and morally responsible solutions to organizational and societal issues.

Beyond the learning goals of the Freeman College Core Curriculum, Business Analytics majors will:

1. Understand and critically apply the concepts and methods of the discipline to support predictions and decisions in real-world situations.
2. Foster the ability to bridge the gap between technical teams and stakeholders by working effectively as a member or leader of an interdisciplinary team and communicate the outcomes to the relevant decision makers.
3. Learn how to evaluate and quantify uncertainty and risk, incorporating their inherent influence on both the decision process and the outcomes.
4. Commit to ethical decision-making and the long-run welfare of both organizations and the communities they serve.
5. Develop an appreciation and dedication for personal continuous improvement, leading to a long-lasting and relevant knowledge base and skill set.

Courses

ANOP 102. Spreadsheet Modeling & Data Analysis. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3,Other:1
This course serves as the introduction to quantitative modeling and basic statistical analysis in a spreadsheet-based environment, especially as they apply to managerial decision making.

ANOP 202. Operations Management. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This course introduces students to the ways in which to model, analyze, and improve processes for producing services and goods. Prerequisite: ANOP 102. ENGR 226 or MATH 216 or MATH 227 or PSYC 215 accepted with permission of the instructor.

ANOP 203. Introduction to Programming for Business Analytics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Overview of programming tools and methods for analytics. Students solve computational and modeling problems using Python. This foundation of programming logic will help students understand advanced analytic tools in the upper-level Business Analytics courses. Not open to students who have taken CSCI 203.

ANOP 204. Sports Analytics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on analytical techniques and their application to the sports industry. Course topics include player evaluation, team ratings, scheduling and coaching strategies. A basic knowledge of Excel spreadsheets, probability, statistics and sports (specifically, baseball, basketball and football) is assumed. Prerequisite: ANOP 102 or MATH 216 or PSYC 215.

ANOP 242. Database Management and Applied Data Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Databases are essential for organizations to collect, store and use data in an effective way. This course introduces students to how databases are designed and operated. The students will learn the principles of database design, the relational model and the SQL language. Prerequisite: ANOP 102 or permission of the instructor.

ANOP 270. Data Visualization for Business Analytics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to the principles of data visualization and data preparation. Instruction in software to prepare and present data through the creation of tables, charts and dashboards to aid in communication of insights. Prerequisite: ANOP 102 or ENGR 215 or ENGR 226 or MATH 216 or MATH 227 or PSYC 215.

ANOP 301. Global Supply Chain Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course students will learn the concepts and tools to model, analyze and improve global supply chain operations under a variety of contexts. Prerequisites: ANOP 102. ENGR 226 or MATH 216 or MATH 227 or PSYC 215 accepted with permission of the instructor.

ANOP 302. Financial Decision Modeling using Spreadsheets. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Decision making of individuals and groups in organizations. Topics include linear and nonlinear optimization with applications in finance and accounting, fundamentals of portfolio and risk management, and the application of Monte Carlo methods to the pricing of derivatives. Prerequisites: ACFM 203 or ACFM 210 and ANOP 102, or equivalents.

ANOP 310. Independent Study in Analytics and Operations Management. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Independent Study in Analytics and Operations Management. Prerequisite: permission of the instructor.

ANOP 311. Supply Chain Analytics. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
In this course students will learn basic concepts in quantitative supply chain modeling and simulation. Students learn methods that are used extensively in business organizations to solve large, structured problems. Prerequisite: ANOP 102. ENGR 226 or MATH 216 or MATH 227 or PSYC 215 accepted with permission of instructor.

ANOP 315. Special Topics in Analytics and Operations Management. .25-1 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies
Special Topics in Analytics and Operations Management. Prerequisite: permission of the instructor.

ANOP 330. Predictive Analytics: Machine Learning Fundamentals for Business. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of the concepts, methods, and applications of machine learning toward problems in business. Topics include classification, prediction, and clustering methods. Students will require a laptop in class. Prerequisites: (ANOP 102 or ENGR 215 or ENGR 226 or MATH 216 or MATH 227 or PSYC 215) and (ANOP 203 or CSCI 203).

ANOP 350. Predictive Analytics: Forecasting & Simulation. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Study of statistical modelling and simulation techniques for data and model-based forecasting (Time Series, Smoothing Methods, Regression, ARIMA, Simulation, etc.) using a variety of software tools. Prerequisites: (ANOP 102 or ENGR 226 or MATH 216 or MATH 227 or PSYC 215) and (ANOP 203 or CSCI 203).

ANOP 370. Prescriptive Analytics: Decision Modeling & Optimization. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
An introduction to decision modeling and analysis using deterministic optimization models and solution methodologies. Prerequisites: (ANOP 102 or ENGR 215 or ENGR 226 or MATH 216 or MATH 227 or PSYC 215) and (ANOP 203 or CSCI 203). Open to juniors and seniors.

ANOP 390. Honors Course in Analytics and Operations Management. .5-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3; Repeatable
Honors Course in Analytics and Operations Management. Prerequisite: permission of the instructor.

ANOP 400. Business Analytics Practicum. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
A culminating experience course where student teams collaborate with external clients on semester long projects leveraging the skills and concepts acquired within the Business Analytics major. Prerequisites: ANOP 330 and (ANOP 350 or ANOP 370 or MATH 358). Open to junior and senior Business Analytics majors. Others by permission of instructor.

Management & Organizations

Faculty

Professors: Neil Boyd (Chair), Vanessa Hill, Eric C. Martin, William R. Meek

Associate Professor: Melissa Intindola

Assistant Professors: Leandro Bonfim, Hyeonjin Cha, Udayan Dhar, Leila Soleimani

Professor of Practice: Robyn Eversole

To ensure a continued focus on shared goals and values, responsible decision-making, coordinated action and wise and sustainable resource use, organizations need individuals who have learned to lead and manage a wide variety of organizational activities.

Bucknell students majoring in management and organizations (MORS) will have numerous opportunities to apply theories of managing and organizing to real-world challenges similar to those they'll encounter in their lives after graduation. Through experiential and reflective means, MORS majors will gain a broad perspective on organizational forms in various sectors (i.e., private, public, nonprofit, cross-sectoral and hybrid). They will learn to think in an integrated, systemic and strategic manner, and will gain skills in communication and coordination, stakeholder management, organizational politics, leadership, negotiations and employee motivation and behavior.

MORS graduates will be well-prepared to establish and lead organizations or organizational units; they will have further developed their abilities to empathize and to creatively conceive of productive approaches to dealing with challenges. Moreover, MORS students will learn about sustainability, as managers of all kinds of organizations need to understand sustainability challenges so that they can be prepared to lead their organizations in doing their part to achieve the UN's Sustainable Development Goals.

In addition to completing the MORS Core Curriculum (MORS 201, MORS 202 and MORS 400), MORS Majors can complete the requirements of the major via two different paths:

1. In consultation with their academic adviser, a MORS major can self-define a bundle of five MORS electives that constitutes an intellectual identity in the Management & Organizations Major. (p. 431)
2. Or, a MORS major can complete one of the four defined concentrations listed below.

    - Entrepreneurship (p. 431)
    - Global Management (p. 432)

- Human Resource Management (p. 432)
- Managing for Sustainability (p. 432)

In the spring of their sophomore year, all BSBA students will, in consultation with their advisers, select a major from among the Freeman College of Management departments and will complete the specific major requirements in addition to the Freeman College core curriculum requirements (p. 404). Transferring between majors within the Freeman College of Management is possible as long as the student will be able to meet all degree requirements of the new major and still graduate on schedule.

Management & Organizations Requirements

Beyond completion of the Freeman College core curriculum requirements, (p. 404) all MORS majors must complete the following set of eight courses:

MORS Core Requirements

MORS 201	Organizational Forms, Strategy and Structure	1
MORS 202	People in Organizations	1
MORS 400	Management Consulting [CE]	1

In addition to completing the MORS Core Curriculum, MORS majors can complete the remaining requirements of the major via two different paths.

1. In consultation with their academic adviser, a MORS major can self-define a bundle of five MORS electives that constitutes an intellectual identity in the Management and Organizations major. (p. 431)
2. Or, a MORS major can complete one of the four defined concentrations listed below.

    - Entrepreneurship (p. 431)
    - Global Management (p. 432)
    - Human Resource Management (p. 432)
    - Managing for Sustainability (p. 432)

Management & Organizations Major

(with self-defined MORS electives)

In addition to completing the MORS core requirements, a student completes five elective MORS courses. Any course with a MORS prefix that is not included in the BSBA or MORS core may count as an elective.[1]

Entrepreneurship

In addition to completion of the MORS core requirements, the entrepreneurship concentration includes completion of five courses, as follows:

Foundational Knowledge

MORS 240	Entrepreneurship	1

Entrepreneurship Breadth Courses[1] – choose at least two from

ACFM 383	Entrepreneurial Finance	1
MORS 241	Social Innovation and Entrepreneurship	1
MORS 340	Advanced Entrepreneurship	1
MORS 299	Management Internship	1

Complementary Courses[1] – choose no more than two from

ACFM 335	Negotiations & Conflict Management	1
ANOP 270	Data Visualization for Business Analytics	1
MIDE 300	Markets, Innovation & Design	1
MIDE 302	Design Realization	1
MORS 210	Human Resource Management	1
MORS 220	Leadership Theory & Development	1

Global Management

In addition to completion of the MORS core requirements, the global management concentration includes completion of five courses, as follows:

Foundational Knowledge

MORS 230	Global Management and Grand Challenges in the 21st Century	1

Global Management Breadth Courses[1] – choose four from

ACFM 367	The Global Flow of Capital	1
ANOP 301	Global Supply Chain Management	1
MIDE 215	Special Topics in Markets, Innovation, and Design (When Offered as Global Marketing)	1
MORS 231	Crisis Management	1
MORS 299	Management Internship	1
UNIV 200	Integrated Perspectives Course ‡	1

Human Resource Management

In addition to completion of the MORS core requirements, the human resource management concentration includes completion of five courses, as follows:

Foundational Knowledge

MORS 210	Human Resource Management	1

Human Resource Management Breadth Courses[1] – choose two from

MORS 310	Talent Acquisition & Development	1
MORS 311	Total Rewards & Performance Management	1
MORS 299	Management Internship	1

Complementary Courses[1] – choose two MORS electives.

Managing for Sustainability

In addition to completion of the MORS core requirements, the managing for sustainability concentration includes completion of five courses, as follows:

Managing for Sustainability Breadth Courses[1] – choose five from

ACFM 368	Affordable Housing: Policy and Practice	1
ACFM 384	Fundamentals of ESG Investing	1
MORS 230	Global Management and Grand Challenges in the 21st Century	1
MORS 231	Crisis Management	1
MORS 241	Social Innovation and Entrepreneurship	1
MORS 250	Poverty and Organizations	1
MORS 251	Environmental Social & Governance Reporting	1
MORS 299	Management Internship	1
UNIV 200	Integrated Perspectives Course ‡	1

Culminating Experience

All BSBA majors must satisfy the Culminating Experience component of the Freeman College of Management General Education Curriculum. MORS majors fulfill this requirement by successfully completing MORS 400 Management Consulting.

Management & Organizations Department Suggested Plan of Study

Below is a general guide for when to take the courses that count toward the Freeman College Core and your major requirements. Suggested term(s) of study are denoted in parenthesis. These are just a general guide. Other sequences are possible. Consult the Bucknell course schedule for course availability in each semester. Refer to your catalog year for specific information about your major and related prerequisites.

Abbreviation Key:

FY = First Year		
SO = Sophomore Year		
JR = Junior Year		
SR = Senior Year		
FREEMAN COLLEGE CORE COURSES = 8.5 credits		
ANOP 102	Spreadsheet Modeling & Data Analysis (FY either semester)	1
ECON 101	Economic Principles/Problems (FY either semester)	1
MGMT 100	Exploring Management (FY first semester)	.5
MGMT 101	Introduction to Organization and Management (FY second semester) # w	1
ACFM 104	Foundations of Accounting I (SO either semester)	1
ACFM 203	Corporate Finance (SO or JR either semester) p	1
ANOP 202	Operations Management (SO or JR either semester)	1
MIDE 201	Marketing (SO or JR either semester)	1
MORS 302	Responsible Management (JR second semester, SR either semester) p	1
MORS Core Courses = 3 credits		
MORS 201	Organizational Forms, Strategy and Structure (SO either semester)	1
MORS 202	People in Organizations (FY second semester or after)	1
MORS 400	Management Consulting (JR second semester, SR either semester) p CE	1
In addition to completing the MORS Core Curriculum, majors can complete the rest of the major requirements through either the self-defined bundle or one of the four defined concentrations below.		
MANAGEMENT & ORGANIZATIONS (self-defined area of focus) = 5 credits		
Five MORS electives. Any course with a MORS prefix that is not included in the BSBA or MORS core may count as an elective. (FY second semester or after) p 1		
ENTREPRENEURSHIP CONCENTRATION = 5 credits		
MORS 240	Entrepreneurship (FY second semester or SO either semester)	1
Choose at least two of the following: 1		
ACFM 383	Entrepreneurial Finance (JR or SR either semester) p	1
MORS 241	Social Innovation and Entrepreneurship (FY second semester or after)	1
MORS 340	Advanced Entrepreneurship (JR or SR either semester) p	1
MORS 299	Management Internship (JR or SR either semester)	.25-1
Choose no more than two of the following: 1		
ACFM 335	Negotiations & Conflict Management (SO second semester or after)	1
ANOP 270	Data Visualization for Business Analytics (SO second semester or after) p	1
MIDE 300	Markets, Innovation & Design (SO second semester or after) p	1
MIDE 302	Design Realization (SO second semester or after) p	1
MORS 210	Human Resource Management (SO first semester or after) p	1
MORS 220	Leadership Theory & Development (SO first semester or after)	1
GLOBAL MANAGEMENT CONCENTRATION = 5 CREDITS		
MORS 230	Global Management and Grand Challenges in the 21st Century (FY second semester or SO either semester) p	1
Choose four of the following: 1		
ACFM 367	The Global Flow of Capital (SO or JR either semester)	1
ANOP 301	Global Supply Chain Management (SO or JR either semester) p	1
MIDE 215	Special Topics in Markets, Innovation, and Design (SO or JR either semester) *	1
MORS 231	Crisis Management (FY spring semester, SO or JR either semester)	1
MORS 299	Management Internship (JR or SR either semester)	.25-1
UNIV 200	Integrated Perspectives Course (SO either semester) ‡	1
HUMAN RESOURCE MANAGEMENT CONCENTRATION = 5 CREDITS		
MORS 210	Human Resource Management (SO either semester, JR first semester) p	1
Choose two of the following: 1		
MORS 310	Talent Acquisition & Development (JR or SR either semester) p	1
MORS 311	Total Rewards & Performance Management (JR or SR either semester) p	1

MORS 299	Management Internship (JR or SR either semester)	.25-1
Choose any two electives with a MORS prefix that are not included in the Freeman or MORS core (FY second semester or after) [1]		
MANAGING FOR SUSTAINABILITY CONCENTRATION= 5 CREDITS		
Choose five of the following: [1]		
ACFM 368	Affordable Housing: Policy and Practice (SO either semester or after)	1
ACFM 384	Fundamentals of ESG Investing (SO either semester or after)	1
MORS 230	Global Management and Grand Challenges in the 21st Century (FY second semester or after)	1
MORS 231	Crisis Management (FY second semester or after)	1
MORS 241	Social Innovation and Entrepreneurship (FY second semester or after)	1
MORS 250	Poverty and Organizations (FY second semester or after)	1
MORS 299	Management Internship (JR or SR either semester)	.25-1
UNIV 200	Integrated Perspectives Course	1

Lab science should be taken before the end of the sophomore year. **Strongly recommend lab science not be taken in the same semester in which you are enrolled in MGMT 101.**
w Satisfies W2 requirement.
p Consult the course catalog for possible prerequisite(s) required for this course.
CE Qualifies for the culminating experience if taken spring of junior year or either semester of senior year.
[1] With prior approval of the academic adviser, some of these electives may come from departments across the University.
* Only when offered as International Marketing.
‡ Only when offered as Sustainable Management & Technology in a Global Context (offered in winter or May term).

Entrepreneurship Minor

The entrepreneurship minor is intended for students who are interested in developing an entrepreneurial mindset and knowledge, skills and abilities that can lead to entrepreneurial ideas in private, non-profit, public, hybrid, cross-sectoral, socially-oriented or sustainability-oriented organizations.

The minor in entrepreneurship consists of five courses as follows.

Foundation Courses

MORS 201	Organizational Forms, Strategy and Structure	1
MORS 240	Entrepreneurship	1

Entrepreneurship Breadth Courses - choose at least two from

ACFM 383	Entrepreneurial Finance	1
MORS 241	Social Innovation and Entrepreneurship	1
MORS 299	Management Internship	1
MORS 340	Advanced Entrepreneurship	1

Complementary Courses - choose no more than one from

ACFM 335	Negotiations and Conflict Management	1
ANOP 270	Data Visualization for Business Analytics	1
MIDE 300	Markets, Innovation, and Design	1
MIDE 302	Design Realization	1
MORS 202	People in Organizations	1
MORS 210	Human Resource Management	1
MORS 220	Leadership Theory & Development	1
MORS 400	Management Consulting	1

Note: MORS majors who elect the entrepreneurship concentration are not permitted to declare the entrepreneurship minor. Other MORS majors who want to complete the entrepreneurship minor will need to replace the MORS 201 minor requirement with an additional elective course that complements the study of entrepreneurship so that the minor course total remains five.

Human Resource Management Minor

The human resource management minor is intended for students who are interested in studying people in organizations and the field of human resource management.

The minor in human resource management consists of five courses as follows:

Foundational Knowledge

MORS 201	Organizational Forms, Strategy and Structure	1
MORS 202	People in Organizations	1
MORS 210	Human Resource Management	1

Human Resource Breadth Courses – choose two from

MORS 299	Management Internship	1
MORS 310	Talent Acquisition & Development	1
MORS 311	Total Rewards & Performance Management	1

Note: MORS majors who choose the human resource management concentration are not permitted to declare the HR minor. Other MORS majors will need to replace the MORS 201 and MORS 202 minor requirements with an additional two elective courses that complement the study of HR, so that the minor course total remains five. Students should consult their faculty academic adviser for approval of substitute courses.

Drawing upon their professional and liberal education, Freeman College of Management students will be able to collaboratively create positive societal impacts through:

Analysis

- Students will demonstrate the ability to understand organizations and analyze them rigorously.

Integrity

- Students will possess the judgment, vision and integrity necessary to serve society and their professions.

Morality

- Students will identify creative and morally responsible solutions to organizational and societal issues.

In addition to the Freeman Core Curriculum learning goals listed above, graduates of the Management & Organizations program will complete a curriculum designed to help them achieve the following specific learning objectives:

1. They will understand the importance of managing and organizing across multiple sectors to achieve economic, social and sustainable impact.
2. They will understand and be able to apply management and organizational theories, frameworks and concepts toward solutions that positively impact people, organizations and the grand challenges of our world.
3. They will understand the value of interdisciplinary approaches to managing and organizing.
4. They will understand how to inclusively work with diverse stakeholders to create shared value.

Courses

MORS 201. Organizational Forms, Strategy and Structure. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This course explores forms, strategy, and structure in public, private, non-profit, hybrid, and cross-sectoral organizations. Students will be exposed to entity creation dynamics and how strategy and structure align to implement organizational mission.

MORS 202. People in Organizations. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This course explores how to apply theoretical frameworks for explaining, predicting, and influencing the behavior of individuals and groups in organizations. The focus will be on the challenges of managing oneself and others in ways that achieve positive organizational and individual outcomes.

MORS 210. Human Resource Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course focuses on human resource management practices that enable members of an organization to maintain a productive and thriving workforce. Topics include recruitment, selection, training, performance evaluation, compensation, benefits, retention and separation. Prerequisite: MORS 201 or MORS 202.

MORS 211. Controversies in Human Resource Management. 1 Credit.
Offered Occasionally; Lecture hours:3
This course discusses emerging issues and debates in the field of human resource management. Emerging issues in human resource management practice are considered in the context of debates among influential thinkers regarding the effective and ethical treatment of employees.

MORS 215. Special Topics in Management & Organizations. .25-1 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
A course on selected topics in management and organizations.

MORS 220. Leadership Theory & Development. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3
This course examines historical and contemporary leadership theories and their application in multifaceted industries. Students will use the foundation of these theories to explore their own personal leadership vision and create a leadership development plan.

MORS 221. Management Research and Analysis. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course serves as an introduction to management and organizational research methods and design. Students will cover qualitative and quantitative research and analytic techniques, and the spectrum of this process from idea generation and theoretical framing, to data collection and analysis. Prerequisites: ANOP 102 or ENGR 226 or MATH 216 or MATH 227 or PSYC 215 or by instructor permission.

MORS 222. Strategic Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines strategic concepts and explores the challenges of formulating and implementing organizational strategies in public, private, non-profit, hybrid and cross-sectoral organizations.

MORS 230. Global Management and Grand Challenges in the 21st Century. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course will examine the roles of individuals and government, private, nonprofit, and cross-sector organizations, and the alignment of their strategies, structures, processes and value-chain activities, toward achieving environmental, social and governance effectiveness as they confront the grand challenges of the globe.

MORS 231. Crisis Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course embraces an organizational perspective to explore social, economic and political change in communities and nations. We will discuss civil society and NGOs, private sector transitions and institutional reform in governments with particular emphasis on humanitarian assistance and development management during and after crises, disaster and war.

MORS 240. Entrepreneurship. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an overview of how to get an organization off the ground successfully from developing an initial product or service idea, to growing a startup and to a successful exit. The course provides a set of useful frameworks and tools for individuals considering a pursuit of entrepreneurship.

MORS 241. Social Innovation and Entrepreneurship. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course critically examines the promise, perils and achievements of social innovation and entrepreneurship in addressing the world's complex problems. Students will utilize entrepreneurial knowledge, skills and processes in respect to social innovation and entrepreneurship ideation and action.

MORS 250. Poverty and Organizations. 1 Credit.
Offered Occasionally; Lecture hours:3
This course will specifically focus on the role of organizations in shaping and contributing to poverty and its causes and will ask students to consider whether organizations can, or should, do anything to redress current inequities contributing to poverty while creating policy and action to prevent future inequities.

MORS 251. Environmental Social & Governance Reporting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course examines Environmental, Social and Governance (ESG) Reporting, and how organizations design, measure and implement Key Performance Indicators that impact various stakeholders within and in relation to organizations.

MORS 299. Management Internship. .25-1 Credits.
Offered Fall, Spring or Summer; Lecture hours:3
This course involves an internship experience in a private, non-profit, public, hybrid or cross-sectoral organization. Students will engage in organizational tasks which are supervised by a field mentor and they will reflect on specific concepts, models and theories of management that they learned during their college experience.

MORS 302. Responsible Management. 1 Credit.
Offered Both Fall and Spring; Lecture hours:3
This course explores ethics and sustainability challenges associated with complex decisions in a variety of organizational forms. Prerequisite: MGMT 101. Juniors and seniors only.

MORS 310. Talent Acquisition & Development. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course provides an overview of the process by which organizations recruit and deploy the organization's workforce. Students learn theories, research, policies, practices and legal considerations related to recruitment, selection, onboarding and employee development. Prerequisite: MORS 210.

MORS 311. Total Rewards & Performance Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
This course aims to develop an understanding of organization wage and salary statistics, incentive systems and employee health and pension systems. The course will also address performance management methods and their strengths/weaknesses. Students will learn about practice implications on society and develop responsible approaches to implementation. Prerequisite: MORS 210.

MORS 315. Advanced Topics in Management and Organizations. .25-1 Credits.
Offered Fall, Spring or Summer; Lecture hours:Varies; Repeatable
A seminar on advanced selected topics in Management and Organizations.

MORS 316. Independent Study. .25-1 Credits.
Offered Occasionally; Lecture hours:Varies,Other:Varies
Individual study or projects, supervised by instructor. Prerequisite: permission of the instructor.

MORS 340. Advanced Entrepreneurship. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Course focuses on mentoring, guiding and teaching students who have a demonstrated or validated an entrepreneurial idea that could potentially result in the creation of a private, non-profit, public, hybrid, cross-sectoral, socially-oriented or sustainability-oriented organization. Course content focuses on shepherding ideas closer to a viable product/service or scaling. Prerequisite: MORS 240 or MORS 241 or MORS 335 or MORS 370.

MORS 400. Management Consulting. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies,Other:3
This course exposes students to principles and practices of management consulting. Students develop, organize and manage significant community-based projects that involve multiple stakeholder groups toward reaching future goals. Students must integrate knowledge, skills, abilities and experiences that they have accumulated during their college experience. Prerequisites: MORS 201 and MORS 202.

Markets, Innovation & Design

Faculty

Professors: Douglas E. Allen, Michelle Roehm (Kenneth W. Freeman Professor & Dean of the College of Management)

Associate Professor: Eric L. Santanen (Chair)

Assistant Professors: Gabriela Diego (Practice), Annetta Grant, Gulay Guzel, Ankita Kumar

The Markets, Innovation & Design (MIDE) program will expose students to the orchestration, design, logic and strategy underlying organizations' key marketing practices. The MIDE program will highlight the complex interplay that takes place between market research/analysis of consumer-product relationships and the strategic management of the marketing mix or brands. Students pursuing the MIDE program will augment their core understanding of management functions with an interdisciplinary examination of some of the creative, analytical and technical processes that combine to generate ideas and transform them into images, products and services that powerfully shape our culture.

The MIDE program will foster student development of a deep appreciation for the interdisciplinary roots and connections among creative and technical design, marketing and innovation. Moreover, the program will enhance creative thinking and acting. In addition to gaining a better understanding of how their surroundings are constructed, students will cultivate a habit of trying to envision how their world can be improved. Students will also learn quantitative, empathic, interpretive and visual methods to assess the relationships between consumers/users and their environments, with a particular focus on remedying unmet needs and filling gaps between current and ideal circumstances. As they learn more about the overall design process, students also will have the opportunity to practice techniques, such as role playing, sketching, creative narrative, prototyping and simulation, that will help them transform ideas into reality.

In the spring of their sophomore year, all BSBA students will, in consultation with their advisers, select a major from the Freeman College of Management departments and will complete the specific major requirements in addition to the Freeman College core curriculum requirements (p. 404). Transferring between majors within the Freeman College of Management is possible as long as the student will be able to meet all degree requirements of the new major and still graduate on schedule.

Markets, Innovation & Design Requirements

Beyond completion of the Freeman College core curriculum requirements (p. 404), all MIDE majors must take the following courses:

MIDE Core Requirements

MIDE 300	Markets, Innovation & Design	1
MIDE 301	Understanding Consumers	1
MIDE 302	Design Realization	1
MIDE 304	Marketing Management	1

MIDE Electives

Beyond these core MIDE courses, all MIDE majors must choose **three** program-related electives.

The MIDE program is designed to be sufficiently flexible to enable students to pursue a wide range of interests and career scenarios, such as work in market research, brand management, marketing management, public relations, communications, product design, global consumer culture and issues of innovation. Therefore, besides taking the MIDE core (the four courses noted above), students are required to choose, with consultation and approval from their faculty adviser, three program-related electives from courses available elsewhere at the University, **outside** the Freeman College of Management. These choices will depend on what makes the most sense given a student's underlying interests. For example, a student contemplating a career in advertising might select three elective courses, such as Introduction to Visual Culture, Film Production, Popular Culture, Political Economy of Media & Advertising, Digital Photography, or Introduction to Creative Writing. The essential idea behind this loose elective structure is to give students the latitude to delve further into their own intellectual interests in relation to the program's learning objectives. These program-related electives enable students (with the help of their advisers) to apply a more specialized and individualized signature to their program of study. This feature, too, is part of the creativity and innovation embedded in the MIDE program.

Culminating Experience

All BSBA majors must satisfy the Culminating Experience component of the Freeman College of Management General Education Curriculum. MIDE majors fulfill the Culminating Experience requirement by successfully completing MIDE 304 Marketing Management in the spring of their junior year or either semester of their senior year.

Markets, Innovation & Design Suggested Plan of Study

Below is a general guide for when to take the courses that count toward the Freeman College Core and your major requirements. Suggested term(s) of study are denoted in parenthesis. These are just a general guide. Other sequences are possible. Consult the Bucknell course schedule for course availability in each semester. Refer to your catalog year for specific information about your major and related prerequisites.

Abbreviation Key:		
FY = First Year		
SO = Sophomore Year		
JR = Junior Year		
SR = Senior Year		
FREEMAN CORE COURSES = 8.5 credits		
ANOP 102	Spreadsheet Modeling & Data Analysis (FY either semester)	1
ECON 101	Economic Principles/Problems (FY either semester)	1
MGMT 100	Exploring Management (FY first semester)	.5
MGMT 101	Introduction to Organization and Management (FY second semester) [# w]	1
ACFM 104	Foundations of Accounting I (FY second semester or SO either semester)	1
ACFM 203	Corporate Finance (SO either semester or JR first semester) [p]	1
ANOP 202	Operations Management (SO either semester) [p]	1
MIDE 201	Marketing (FY second semester)	1
MORS 302	Responsible Management [p]	1
or MGMT 303	Technological Dystopia	
(either course may be taken JR second semester or SR either semester)		

MARKETS, INNOVATION & DESIGN CORE COURSES = 8 CREDITS		
MIDE 201	Marketing (FY second semester)	1
MIDE 300	Markets, Innovation & Design (SO second semester or JR either semester) [p]	1
MIDE 301	Understanding Consumers (JR either semester or SR first semester) [p]	1
MIDE 302	Design Realization (JR either semester or SR first semester) [p]	1
MIDE 304	Marketing Management (JR second semester or SR either semester) [CE p]	1
Choose three electives for three credits. ‡ p		

\# Lab science should be taken before the end of the sophomore year. **Strongly recommend lab science not be taken in the semester in which you are enrolled in MGMT 101.**

w Satisfies W2 requirement.

p Consult the course catalog for possible prerequisite(s) required for this course.

CE Qualifies for the culminating experience if taken spring of junior year or either semester of senior year.

‡ The MIDE program is designed to be sufficiently flexible to enable students to pursue a wide range of interests and career scenarios, such as work in market research, brand management, marketing management, public relations, communications, product design, global consumer culture, and issues of innovation. Therefore, besides taking the MIDE core (the four courses noted above), students are required to choose, with consultation and approval from their faculty adviser, three program-related electives from courses available elsewhere at the University, **outside** the Freeman College of Management. These choices will depend on what makes the most sense given a student's underlying interests. For example, a student contemplating a career in advertising might select three electives from courses such as Introduction to Visual Culture, Film Production, Popular Culture, Political Economy of Media and Advertising, Digital Photography, or Introduction to Creative Writing. The essential idea behind this loose elective structure is to give students the latitude to delve further into their own intellectual interests in relation to the program's learning objectives. These program-related electives enable students (with the help of their advisers) to apply a more specialized and individualized signature to their program of study. This feature, too, is part of the creativity and innovation embedded in the MIDE program.

Markets, Innovation & Design Minor

The markets, innovation & design (MiDE) minor provides students with the opportunity to complement their major field of study by developing their quantitative, empathic, interpretive and visual skills that underlie any organization's key marketing practices.

The MiDE minor consists of three required courses and two electives for a total of five courses, as follows:

MIDE 201	Marketing [1]	1
MIDE 300	Markets, Innovation, and Design	1
MIDE 301	Understanding Consumers	1
Two additional MiDE electives having at least 0.75 credits each		1.5-2

[1] All BSBA students are exempt from taking MIDE 201 as a requirement of the MiDE minor, thus only needing the other four requirements to complete the minor.

Drawing upon their professional and liberal education, Freeman College of Management students will be able to collaboratively create positive societal impacts through:

Analysis

- Students will demonstrate the ability to understand organizations and analyze them rigorously.

Integrity

- Students will possess the judgment, vision and integrity necessary to serve society and their professions.

Morality

- Students will identify creative and morally responsible solutions to organizational and societal issues.

In addition to the learning goals listed above, graduates of the Markets, Innovation, & Design program will complete a curriculum designed to help them achieve the following specific learning objectives:

1. They will understand the basic principles of marketing, innovation, & design and how these academic disciplines and fields of practice are related.
2. They will be able to analyze problems and think strategically from a marketing point of view.
3. They will cultivate innovative habits that enable them to detect problems and provide them with the impetus and confidence to solve them.
4. They will develop a design mindset that enables them to creatively recast problems in various ways and design novel and effective solutions.

Courses

MIDE 201. Marketing. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Introduction to principles of marketing. Examines how organizations facilitate exchange relationships by customers' needs and wants. Explores the intricacies of identifying and establishing market positions and understanding consumer behavior.

MIDE 215. Special Topics in Markets, Innovation, and Design. 1 Credit.
Offered Fall, Spring or Summer; Lecture hours:3; Repeatable
A seminar on selected topics in marketing, innovation, and design.

MIDE 300. Markets, Innovation & Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A survey of the relationships among marketing, innovation, and design. Students will practice various approaches to creative and innovative thinking. Prerequisite: MIDE 201 or permission of the instructor.

MIDE 301. Understanding Consumers. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
A toolbox of research methods for understanding consumer behavior with appropriate exposure to philosophical and theoretical underpinnings of various approaches. Prerequisite: MIDE 201 or permission of instructor.

MIDE 302. Design Realization. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Implementation of creative techniques for exploring ideas and transforming ideas into appropriate mediums for communication. Includes creative ideation, sketching, digital and physical modeling. Prerequisites: MIDE 201 and MIDE 300.

MIDE 304. Marketing Management. 1 Credit.
Offered Either Fall or Spring; Lecture hours:3
Integrating learned knowledge, students practice making marketing-related decisions through case analysis of various business scenarios. The predominant emphasis is on drawing together disciplinary experiences and providing a more coherent appreciation of the major's academic discipline. The educational goals of the class focus on critical, analytical and synthetic thinking. Prerequisite: MIDE 201 or permission of the instructor.

MIDE 310. Independent Study in Markets, Innovation & Design. .5-2 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Individual study or projects, supervised by instructor. Prerequisite: permission of the instructor.

MIDE 312. Digital Marketing. 1 Credit.
Offered Occasionally; Lecture hours:3
The course examines the overall digital marketing strategy, as well as the specific implementation and executional considerations of digital marketing plans. It provides a detailed understanding of all digital channels and platforms.

MIDE 314. Topics in Markets, Innovation & Design (.5 course credit). .5 Credits.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
A seminar on selected topics in marketing, innovation and design.

MIDE 315. Advanced Topics in Markets, Innovation and Design (1 course credit). 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
A seminar on selected topics in marketing, innovation and design.

MIDE 390. Honors Course in Markets, Innovation & Design. 1 Credit.
Offered Either Fall or Spring; Lecture hours:Varies; Repeatable
Special and independent studies for Markets, Innovation and Design majors selected under the guidelines of the school and the University Honors Council. Honors thesis required. Prerequisites: nomination by the school and permission of the instructor.

ACADEMIC SUPPORT & CAMPUS LIFE

Writing Program

As part of the undergraduate program, a student must successfully complete three writing-intensive courses (known as "W courses"), *i.e.*, a W1 course in the first year, followed by two W2 courses. These courses use writing to help students acquire both subject knowledge and writing proficiency. The W1 courses aim to teach expository skills and writing as a process, and include foundation seminars and some introductory courses. The W2 courses are offered in most departments and they may include courses required for a particular major, courses that help fulfill a general education requirement, and courses that a student may choose as electives. A complete list of W1 and W2 courses is available at https://www.bucknell.edu/writingprogram (https://www.bucknell.edu/writingprogram/) or through the Registrar's Course Information page at https://www.bucknell.edu/x6864.xml, searchable by W1 or W2 requirement.

Not every course that contains writing, even a great deal of writing, will be a W course. Courses approved as W courses have certain characteristics, as follows:

1. A W course provides explicit writing instruction. In writing and revising, students receive the help and advice of their instructor and/or peers. Writing instruction may take the form of written or oral responses to drafts and papers and may include discussion and reading about writing.
2. The W course instructors pay attention to and encourage the different stages of writing as a process: planning, drafting, revising and editing. Writing is treated as a dynamic process of expressing one's ideas in words and revising one's ideas and words by reconsidering them in light of feedback from others. Writing is, therefore, not merely a written end product, but a tool for learning and critical thinking.
3. The W course instructors will teach the conventions of writing that students need. These conventions may vary from discipline to discipline and class to class. Students will learn and practice expository skills and the conventions appropriate to writing in the discipline of the course.
4. In a W course, students write frequently. Writing frequently does not necessarily mean numerous assignments. Students may write multiple drafts of a few assignments. The point is that to improve one's writing, one must write. W courses provide the opportunity for the practice and feedback that are vital to writing effectively.
5. Students write to learn the subject matter of the course. "Writing to learn" may take many forms: notebooks, journals, laboratory reports, fieldwork reports, essays and other formal and informal assignments. Students must think about the material to write about it, and understanding develops from opportunities to articulate the principles and ideas of the course.

Rules governing the University writing requirement are included in the introductory material for the College of Arts & Sciences, the College of Engineering and the Freeman College of Management.

Global & Off-campus Education

The Office of Global & Off-campus Education (https://www.bucknell.edu/academics/beyond-classroom/global-campus-education/) facilitates first-rate off-campus study abroad opportunities that accommodate a range of disciplines throughout diverse regions of the world. The office works with students and faculty to identify and promote programs that support Bucknell University's educational goals, combine outstanding academic coursework and experiential learning in a safe and supportive environment, and integrate into students' undergraduate plans of study to the fullest extent possible. The office strives to enhance students' cross-cultural competency through global programs that facilitate a deep understanding of the cultural, social, political and historical conditions of the host country while highlighting the students' unique positions as responsible actors in a global context.

The staff of the Office of Global & Off-campus Education advise and assist undergraduate students to incorporate a study abroad experience into their academic work. Bucknell University offers yearlong, semester and summer study abroad opportunities through our Bucknell faculty-led programs, global education partners and university exchange programs.

Eligibility Requirements for Semester and Full-Year Students:

• Have completed the full semester on campus prior to your semester abroad;

• Have a cumulative GPA of 2.8 (fall) or 3.0 (spring). (GPA requirements may vary with Bucknell in faculty-led programs);

• Be a sophomore, a junior, or a first-semester senior to study abroad. (The last semester of the senior year must be spent on campus to receive a Bucknell University degree. Participation in a "Bucknell in" program does not meet this requirement.)

• Have a history of good conduct with the University. All conduct and alcohol violations will be evaluated by the Office of Global & Off-campus Education.

• Students who do not meet the GPA requirements for study abroad may consider studying abroad during the summer.

For additional information, please contact the Office of Global & Off-Campus Education at globaled@bucknell.edu.

Bucknell en España

Bucknell en España (https://globaleducation.bucknell.edu/?FuseAction=Programs.ViewProgramAngular&id=10469) offers a high quality academic and residential experience for Bucknell students who want to complete overseas study in Spain. If possible, the Bucknell en España program is open to students who have a proficiency-level equivalent to SPAN 105 or above. Students choose from a wide variety of curricular options at the Universidad de Granada's Centro de Lenguas Modernas to advance their major or minor studies in Spanish or to complement other programs of study at Bucknell. A Bucknell faculty member, normally from the Department of Spanish, serves as faculty-in-residence and teaches a required course (SPAN 245) that deals with some aspect of Iberian culture related to the professor's area of expertise. This course includes several excursions to relevant cultural sites throughout Spain.

Students who have completed five or fewer semesters of Spanish language study at Bucknell will enter one of two tracks at the CLM following a placement exam, taking courses in various disciplines such as anthropology, art history, Spanish and Latin American cultures, dance, economics, geography, history, language and linguistics, literature and film, management, music, political science, sociology, translation, women's studies, and in the spring semester, health and environmental studies.

Students' coursework from the Centro de Lenguas Modernas or the Universidad de Granada counts toward their major at Bucknell, having been approved by the department chair or program director of the major. The SPAN 245 course is a Bucknell University course and receives a Bucknell grade and credit. Courses taken at the CLM must be approved by the student's academic adviser or chair of a specific department for proper credit transfer. The grades of the courses taken through the CLM are not factored into your grade point average.

Bucknell en España offers the best linguistic and cultural immersion experience possible while studying in Spain. It provides the basic structure for living and studying in Granada to take full advantage of the opportunity to live in another culture and learn another language while expanding personal horizons. The basic elements of the experience in Granada are academic courses, living with a host family or in a student residence, program excursions and activities, and participation in a local cultural, social, religious or athletic association to enhance their interaction with the Spanish-speaking community.

The program is centered in Granada, an Andalusian city of approximately 250,000 inhabitants located at the foot of the perennially snow-capped Sierra Nevada mountains, one hour from the Mediterranean Costa del Sol. The Universidad de Granada is one of Spain's most prestigious universities, and its Centro de Lenguas Modernas (CLM) is recognized as a leader in the area of Spanish and Hispanic studies for non-native speakers.

For additional information, please contact the Office of Global & Off-campus Education at globaled@bucknell.edu.

Bucknell en France

Founded in 1987, Bucknell en France provides an opportunity for all Bucknell University students, regardless of major or background in French, to enrich their Bucknell University education by studying in France for an academic year or a semester. Bucknell en France is led by Bucknell faculty and offers expansive educational opportunities in the context of a linguistic and culturally immersive program.

For additional information, please contact the Office of Global & Off-campus Education at globaled@bucknell.edu.

Bucknell in Athens, Greece

The joint Bucknell/Penn State Athens (https://globaleducation.bucknell.edu/?FuseAction=Programs.ViewProgramAngular&id=10466) semester study-abroad program consists of an annual spring program open to qualified juniors. Second-semester sophomores may also apply with special permission from the appropriate dean. The program is led by either a Bucknell or Penn State faculty member.

Students will be enrolled in four courses for a total of four Bucknell University credits. All courses receive Bucknell University grades. The core focus of the program is classics & ancient Mediterranean studies and also includes courses in the social sciences and humanities. All courses are designed to take full advantage of the program location in beautiful Greece, offering numerous day and overnight field trips to sites around Greece, such as Crete, Sparta, Delphi, Olympia and of course, Athens. Students are housed in flats in central Athens.

For additional information, please contact the Office of Global & Off-campus Education at globaled@bucknell.edu.

Bucknell in Ghana

Bucknell in Ghana (BiG) (https://globaleducation.bucknell.edu/?FuseAction=Programs.ViewProgramAngular&id=10471) is the Bucknell University faculty-led semester program in Africa offered in the spring each year. Bucknell faculty teach a course with an African theme at the University of Cape Coast. While in Ghana, students take the core Bucknell faculty-taught course and four other courses from the University of Cape Coast. Students in the program also have the opportunity for specially planned field trips to engage and understand African cultures in Ghana.

The University of Cape Coast is a comprehensive university with both undergraduate and graduate programs. Most students will find courses that satisfy their Bucknell major/minor requirements while on this program. Bucknell in Ghana is open to and appropriate for qualified sophomores and juniors of all majors.

Students reside in University of Cape Coast international student housing and have the opportunity to participate in other academic/social activities with Ghanaian and international students from various countries. Ghana is known for its hospitable cultural environment, which makes this experience very memorable for students.

All credits earned in this program transfer to fulfill Bucknell requirements, but only the Bucknell faculty-taught course(s) will receive a Bucknell University grade.

For additional information, please contact the Office of Global & Off-campus Education at globaled@bucknell.edu.

Bucknell in London

The Bucknell in London (https://www.bucknell.edu/about-bucknell/administrative-offices/international-education/semester-and-full-year-programs/bucknell-in-programs/bucknell-in-london.html) program, offered in the fall and spring semesters, is open to qualified sophomores, juniors and seniors. Students take a combination of courses taught by Bucknell University faculty and by our program provider, Arcadia Abroad. Courses take full advantage of the program's British location, with London as the classroom lab. Single and multi-day academic excursions to sites in London and beyond engage students in the cultural, historical, political and social issues of the city and region. Housed in flats in central London, students experience this cosmopolitan city like Londoners.

Each semester, a different Bucknell professor leads the program and teaches a core course in their field. In addition, British faculty teach a variety of courses in social sciences and humanities, which satisfy a number of college general education requirements.

For additional information, please contact the Office of Global & Off-campus Education at globaled@bucknell.edu.

Management in Asia-Pacific

Study and intern in this Bucknell-in spring semester program in the Asia-Pacific region. Spend eight weeks in Sydney engaged in coursework and eight weeks in Singapore, Auckland or Sydney undertaking a business internship. Students choose from a selection of management and finance courses, such as business law, financial decision modeling and international finance. In addition, an Australian culture course is offered. During the internship phase of the program, students will also be enrolled in Intercultural Management: Interacting in the Global Workplace.

Students live in apartments in Sydney, Singapore and Auckland and have opportunities to engage with the host culture. In Sydney, students prepare their own food. In Singapore, it is typical to eat at one of the many Singapore hawker centres, large food courts serving a variety of ethnic foods.

For additional information, please contact the Office of Global & Off-campus Education at globaled@bucknell.edu.

Short-Term Opportunities

Bucknell in Short-Term Opportunities

In addition to semester and full-year programs, Bucknell University students may participate in winter or summer Bucknell in Short-Term Programs (https://www.bucknell.edu/academics/beyond-classroom/global-campus-education/study-abroad-programs/) led by Bucknell University faculty and offered by third-party providers. Each year, numerous Bucknell in Short-Term Programs (https://www.bucknell.edu/academics/beyond-classroom/global-campus-education/study-abroad-programs/) are offered in various locations such as Antigua/Puerto Rico, Spain, Dublin, France and other locations. Programs vary year-to-year and updates are noted on the program webpage. Students interested in Bucknell in Short-Term Programs (https://www.bucknell.edu/academics/beyond-classroom/global-campus-education/study-abroad-programs/) should contact the appropriate faculty directors before submitting an application.

Study Abroad Providers' Summer Opportunities

Students applying to programs offered by study abroad providers must schedule an appointment with the Office of Global & Off-campus Education to discuss possible program options. Aside from the provider application, there is a brief additional Bucknell application (non-Bucknell Summer) and a Transfer of Credits (TOC) form that students will need to complete to have the credits transferred to Bucknell.

Summer study abroad is open to all students regardless of class year. Eligibility requirements and application deadlines differ for each program, but all students who plan to study abroad in the summer must have a history of good conduct. Students taking part in summer programs will be responsible for tuition and all other expenses. Bucknell is not affiliated with any provider, so make sure to read and feel comfortable with cancel/refund policies before committing to a program.

For additional information, please contact the Office of Global & Off-campus Education at globaled@bucknell.edu.

Graduate Studies

Bucknell grants master's degrees in: animal behavior, biology, chemistry, engineering (chemical, civil, electrical, environmental and mechanical), English and psychology. Five-year coordinated bachelor's and master's programs are provided in chemistry and engineering.

Students are admitted to graduate standing by the dean of graduate studies. More information about application for admission and graduate financial aid is located on the web at bucknell.edu/GraduateStudies (https://www.bucknell.edu/GraduateStudies/).

A regular undergraduate student with a strong record of academic achievement who has arranged to complete all undergraduate degree requirements may with prior approval take up to two courses for graduate credit. An application for graduate credit by an undergraduate student may be obtained from the Office of Graduate Studies.

Non-degree students wishing to enroll in graduate courses must apply to the Office of Graduate Studies.

Summer Session

Bucknell University offers regular Bucknell courses and off-campus study courses. The summer session serves both undergraduate and graduate students who choose to take summer courses to enrich their educational experience or to accelerate their degree progress at Bucknell or elsewhere.

Bucknell's summer session offers courses across the curriculum. Students who are working toward degrees or certification are advised to consult with their advisers to determine which summer courses most appropriately meet their needs. Students also are encouraged to explore new interests and to develop new skills and areas of expertise that will serve them well in any career path. One of Bucknell's goals is to provide the means for fostering the growth and development of a lifelong commitment to learning.

Most departments in all three colleges offer independent study or special project courses that permit students, in consultation with members of the faculty, to develop a course of study tailored to their individual needs. Arrangements for such courses should be made as early as possible to ensure that a faculty member willing to direct the student's study will be available during the summer.

University Scholars Programs

Global Engineering Perspectives Scholars Program (GEPS)

The Global Engineering Perspectives Scholars Program offers students the opportunity to benefit from Bucknell's liberal arts environment and strong culture of study abroad programs. This scholars program exists to encourage students to engage in coursework and experiences that cultivate intercultural humility and to recognize the students who do. Students who satisfy the requirements will have "Global Engineering Perspectives Scholar" added to their transcript. The requirements are: (a) demonstrated proficiency in a foreign language (200+ FL course or equivalent), (b) participation in an abroad experience, (c) completion of a minimum of three courses designated as GBCC (Global Connections) and/or CCFL (Foreign Language), (d) completion of a minimum of three engineering credits, and (e) submission of a reflective impact statement and application by the last day of February of your graduation year. If you have an interest in studying abroad and/or studying a foreign language, this is a great opportunity!

Grand Challenge Scholars Program (GCSP)

The world faces complex challenges related to social access, energy and environmental sustainability, health, and security. The Grand Challenges Scholars Program at Bucknell incorporates four grand challenge themes of sustainability, health, security and social access. Participating students receive mentorship regarding how to integrate these themes into the many curricular and co-curricular activities they undertake throughout their college careers. As they engage and develop solutions for emerging global issues, students gain valuable skills and competency in: research and scholarship, multidisciplinarity, entrepreneurship, multiculturalism and social consciousness. Through the program activities, they will also learn the importance of considering social, political and historical factors to define a problem or offer a solution. Grand Challenges Scholars who complete the program join a prestigious network of scholars from other institutions of higher learning. For more details on this program, please visit www.bucknell.edu/GCSP (http://www.bucknell.edu/GCSP/).

Campus Facilities

Academic Buildings

Academic East stands behind Bertrand Library and next to Academic West. The 78,000-square-foot building provides 25 laboratories housing cutting edge research equipment found almost nowhere else in the world and nearly doubles the lab space available for the College of Engineering. The building also provides numerous places for students to gather and collaborate: 30 offices, four classrooms, and research space for the College of Engineering and the Department of Education. The building has several unique features to demonstrate sustainability, including a solar chimney to reduce energy use, a two-story “green” wall, and a sustainability command center where students can monitor campus wide energy use. The building received LEED Gold certification.

Academic West, opened in August 2013, is a 70,000-square-foot building that provides nine state-of-the-art classrooms, 10 flexible project/conference room spaces, a GIS laboratory, 60 faculty offices, and two suites to support cross-disciplinary faculty initiatives, such as the Institute for Public Policy. The building has a vegetated roof, energy efficient design, and is LEED Silver rated. LEED Platinum Certification for Operations & Maintenance was received in May 2020. Academic West is the first academic building in Pennsylvania and one of the first in the northeast to achieve LEED O&M Platinum Certification.

The Animal Behavior Laboratory consists of offices, seminar rooms, computer rooms, and areas for housing animals, including quarantine cages and two all-weather enclosures in which two species of nonhuman primates live. The main building was built in 1947 and rebuilt in 1964 to serve its current function. A major renovation of the facility was completed in 1990. The HVAC and roofing systems were replaced in 2017.

The Art Barn, a converted dairy barn on the west campus, and surrounding buildings, support the art curriculum with more than 10,000 square feet of classrooms and workshops.

The Ellen Clarke Bertrand Library, built in 1951 and named for a generous benefactress, is the center of information services for the campus. Located in one of the landmark buildings at Bucknell University, the library is a leader among peer institutions in providing access to an outstanding traditional print collection as well as the increasingly important world of digital information. The Information Commons on the library's first floor provides students with one location to get assistance with everything from how to find resources to write a paper, to how to troubleshoot a computer or network problem. The library offers a variety of study spaces, including a newly renovated 24-hour study lounge, network connections, databases, media services and computer workstations. The Office of Civic Engagement relocated to the library in 2010.

The Botany Building was renovated in 1992. The building houses the Center for Career Advancement and the Office of Global & Off-campus Education (OGOE).

The Breakiron Engineering Building opened for classes in the summer of 2004. The building is connected at each floor to Dana Engineering to provide continuity between the two buildings in support of the interdisciplinary curriculum. The structure provides state-of-the-art laboratories and classrooms as well as office space. The building is named for Lauren ’52 and Margit Breakiron, whose lead gift made the project possible.

Bucknell Hall, dedicated in 1886, was renovated in 1988 for use as a poetry center and recital hall. It houses the Stadler Center for Poetry, named for benefactors Jack Stadler ’40 and his wife, Ralynn.

The Carnegie Building, constructed in 1905 under a grant from Andrew Carnegie, originally served as the library of the University. The building, which has been modified over the years, had a major renovation in 2015 to restore it to a condition similar to its original appearance and now houses the Teaching & Learning Center, the Writing Center and other academic support offices. The renovation received the 2017 USGBC Central PA "Rise to the Challenge" award and the building is LEED certified.

William H. Coleman Hall, dedicated in 1959, was a gift of the F.W. Olin Foundation and is named in honor of the late Dr. Coleman, who served Bucknell for more than 30 years as a professor of English, dean of the University and vice president. Renovated in 2002, it houses classrooms, faculty offices, several lecture halls, a number of laboratories and seminar rooms, and a 500-seat theatre equipped for work in the dramatic arts. Renovated in 1996, the theatre was renamed the Harvey M. Powers Theatre in 1997.

The Charles A. Dana Engineering Building is named for a generous benefactor in recognition of his support of engineering and scientific education. Begun in 1921 and completed in 1940, it houses the College of Engineering and provides the many laboratories and classrooms essential to the University’s engineering program. A $4 million renovation and expansion of the building was completed in June 1985. A 2001 addition called the Collaborative Learning Space incorporates the latest teaching/classroom design. In 2011, the Richard J. Mooney Innovative Design Laboratory, a gift to the University in honor of Richard Mooney ’60, was constructed to expand the Product Development Lab.

Attached to the Dana Engineering Building is the **Computer Center** (built in 1980), which serves as the network and telecommunications hub for the campus. Every student living on campus has easy access to a high-speed connection to the campus network and the internet. Laptops can connect to the wireless network that is available across much of the campus, creating an environment of “any time, any place access.” While student ownership of computers is not required, most students find having one to be a valuable part of the Bucknell experience. A variety of electronic classrooms and labs, the Information Commons in the library, a strong set of network services, and access to the network from student housing provides the Bucknell student with almost ubiquitous access.

The Brungraber Civil Engineering Structural Test Laboratory, east of Dana Engineering, houses a 600,000-pound Baldwin universal testing machine as well as civil engineering offices and other testing equipment.

Elizabeth Koons Freas Hall was given to Bucknell in 1965 by the late A. Guy Freas, a trustee of the University, in honor of his wife. Connecting Coleman Hall with Marts Hall, it houses the admissions offices. The prominent patio atop the building on the Malesardi Quadrangle was renovated in 2002.

The Elaine Langone Center, which opened in 1971, contains the student post office; offices for student life and student government; study, game and lounge rooms; facilities for lectures, performances and meetings; the Samek Art Museum; and dining facilities, including a snack bar. The Roy Grier Bostwick Memorial Dining Room, serving students, is named in recognition of a gift to the University in his honor from the estate of his widow, Marie Leiser Bostwick. In 1990, Bucknell Trustee Ken Langone '57 provided the naming gift for the student center in honor of his wife, Elaine. The Bostwick Dining Room and Servery were completely renovated in 2002. A major renovation to the snack bar was completed in 2006. A student hearth space was established in 2011 on the ground floor of the building.

Hildreth-Mirza Hall was renovated and expanded with a 7,000-square-foot addition to the former Demosthenean Hall in 2018 (previously occupied by Delta Upsilon fraternity). The project provided new space for departments within the humanities, including a digital humanities lab, several conference rooms, offices, a great room and other collaborative workspaces. The original 1941 building and 1966 addition were completely renovated. The building contains attractive finishes, new energy efficient HVAC and electrical systems, a green roof terrace and exterior landscaping. The renovation received the 2018 USGBC Central PA "Rise to the Challenge" award and the building is LEED Silver certified.

Holmes Hall, completed in 2021, is a 79,800-square-foot building that houses the Freeman College of Management and the Department of Art & Art History to enhance our interdisciplinary approach to a holistic education. In addition to nearly 20 technology-rich classrooms, labs and studios, Holmes Hall houses ample collaboration space, a 200-seat auditorium, large central atrium and ground and third-floor patios for gatherings, art exhibition space and The Moriarty Investment Lab. This building received LEED Gold Certification.

The Observatory, constructed in 1963 to replace an earlier one that was a gift of William Bucknell, includes labs and the Tressler Observing Laboratory (2014) with a retractable roof that houses telescopes.

The O'Leary Psychology & Geology Center opened for the 2002 fall semester. The 40,000-square-foot facility brings together the psychology department staff in one location and provides new office, classroom and lab space for the geology and psychology departments. This building completes the phased development of the science center project. It is named in honor of Brian '60 and Judith McAllister O'Leary '60.

Funds for the construction in 1955 of the **F.W. Olin Science Building** came from the F.W. Olin Foundation. Renovated in 1989-1990, it houses the departments of physics and mathematics, and Bucknell Center for Sustainability & the Environment (BCSE).

The Charles M. & Olive S. Rooke Chapel seats 500 on the main floor and 250 in the balconies. In addition to the chaplain's offices, the south wing houses a reception room and a meditation chapel. The chapel was given to the University in 1964 by Robert L. Rooke, Class of 1913, secretary emeritus of the Board of Trustees, in memory of his parents. Rooke Chapel was renovated during the summer of 2005.

The **Robert L. Rooke Science Center**, named in 2011 for Robert Rooke '13, includes the Rooke Chemistry Building completed in 1990 and the biology building completed in 1991. The chemistry building contains classrooms and seminar rooms, faculty offices and modern laboratories for faculty and students. In addition, designated laboratories house special equipment, such as nuclear magnetic resonance spectrometers, a gas chromatograph-mass spectrometer, and an X-ray diffractometer.

The biology building houses faculty offices and research laboratories as well as a variety of laboratories designed for use by both non-majors and majors, and a rooftop greenhouse. Students enrolled in the biochemistry and cell biology majors share laboratories in the adjoining buildings. New animal study laboratories were constructed in the building in 2002.

Stephen W. Taylor Hall, named in honor of the author of the University's charter, was erected in 1849 as the first building on College Hill. In 1994, Taylor Hall was renovated and was home to the Freeman College of Management until their new space in Holmes Hall was completed. Taylor Hall will be utilized as swing space pending finalization of plans to determine its future use.

The Leanne Freas Trout Auditorium in the Vaughan Literature Building was recently restored to its original grandeur. In 2003, it was dedicated in honor of Leanne Freas Trout, Class of 1950, for the years of loyalty, service, time and leadership she and her family devoted to Bucknell.

The Tustin Building, which was used for many years as a gymnasium, is named in honor of Francis W. Tustin, Class of 1856, who later became a member of the faculty. Dedicated in 1890, the building was completely remodeled and equipped in 1938 and a wing was added in 1961. Tustin is used for academic and extracurricular programs. In 1986, the flexible black box Tustin Studio Theatre was opened.

The Charles P. Vaughan Literature Building and Arnaud C. Marts Hall correspond in design and size to Coleman Hall. A 450-seat auditorium, classrooms and faculty offices are provided in the Literature Building, completed in 1938 and named in honor of Charles P. Vaughan, a trustee who also served as acting president in 1931.

Marts Hall, built in 1960, houses administrative offices as well as departments of instruction. Arnaud C. Marts, for whom it is named, was the University's seventh president and a member of the Board of Trustees.

Completed in 1988, the **Sigmund & Claire Weis Center for the Performing Arts,** a concert hall with seating for 1,300, is located west of the Malesardi Quadrangle at the entrance to the campus, opposite Rooke Chapel.

The Sigfried Weis Music Building, located next to the Weis Center for the Performing Arts, was completed in fall 2000 and houses classrooms, faculty offices, a computerized keyboard lab, practice rooms, a music library and a 176-seat recital hall named in honor of Natalie Davis Rooke. The building is named for Sigfried Weis, former chairman of the Bucknell Board of Trustees.

Athletic & Recreational Buildings

The University added substantially to the facilities available for recreation and athletics with the 2003 dedication of the **Kenneth Langone Athletics & Recreation Center**. Kinney Natatorium, opened in fall 2002, houses an Olympic-size pool and the Krebs Fitness Center, a 14,000-square-foot fitness center. The Sojka Pavilion is a 4,000-seat, multipurpose gymnasium opened at the beginning of the second semester of the 2002-2003 academic year. Renovations to existing facilities include a new training center in the Davis Annex and varsity locker rooms in the Fieldhouse, as well as new coaching offices in Davis Gym. In 2011, through the gift from a parent, the unused tiered seating area for the old pool was converted into an ergometer training facility for the crew teams.

The Recreational Sports Complex includes the **Gerhard Fieldhouse,** completed in 1978, which provides greatly expanded facilities for intramural and recreational activities and sports, as well as indoor practice space for intercollegiate teams. It includes a 350-foot by 180-foot main playing floor that has been laid out to include a six-lane, 220-yard track oval that was resurfaced in 2008. There are five tennis courts, six volleyball courts and seven basketball courts laid out on the floor. This playing area also can be used as a surface for any of the field sports and can be subdivided by a system of nets to permit a number of concurrent activities. An L-shaped building wrapped around the playing floor on two sides includes a dance studio, five handball/racquetball courts, four squash courts and a climbing wall.

The Fieldhouse is connected to **Davis Gymnasium**, named in honor of the late Warren Davis, Class of 1896, a member of the Board of Trustees. The main part of the gymnasium, completed in 1938, was the gift of 20 trustees.

The **William A. Graham IV Building** is connected to Sojka Pavilion and was completed in 2016. This 36,000-square-foot addition to the campus brings together health, wellness and athletic resources in a central hub. The first floor is comprised of Student Health, the Counseling & Student Development Center, and a Health & Wellness Center, which provides a dedicated space for faculty and staff wellness initiatives as well as student-focused programming. The second floor contains a world-class training facility for the Bison wrestling team to rival the best campus training centers in the United States. The building is LEED Silver certified.

Depew Field, an artificial surface baseball complex, and **Becker Field**, a natural grass softball facility, both underwent substantial renovations in 2012. New grandstands were installed in 2017.

The **Bachman Golf Facility**, an indoor/outdoor instructional golf facility, opened in fall 2011 for varsity and recreational use.

Holmes Stadium, completed in 2007, is a double-sided, 1,200-seat covered grandstand facility that supports both the **William A. Graham IV Field**, a lighted, artificial turf field for hockey, women's lacrosse, and recreation that was completed in 2003; and **Emmitt Field**, a lighted, sand-based natural turf soccer field completed in 2005.

The Pascucci Family Athletics Complex was named in 2021 and includes the **Christy Mathewson-Memorial Stadium** that seats about 13,000 people and has an eight-lane, all-weather track and grass-like artificial playing field for football and lacrosse. A gift of alumni and friends of the University, the stadium was dedicated in 1924 to the memory of Bucknell men and women who served their country in times of war. After its renovation in 1989, it was renamed to honor Christy Mathewson, a member of the Class of 1902. At the main entrance to the stadium is the Christy Mathewson Gateway, erected in 1928 and presented to the University by organized baseball in memory of the Hall of Fame pitcher. The press box was renovated in 2017. New LED lights programmable to three different lighting levels were installed in 2018 and a new video scoreboard was installed in 2021. A synthetic turf practice field between the north end of the stadium and the Christy Mathewson Gates was completed in 2022. The **Michael C. Pascucci Team Center** was dedicated in April 2024.

Other athletic facilities include: a jogging course, an 18-hole golf course, 10 lighted tennis courts, two lighted platform tennis courts, two lighted outdoor basketball courts, several outdoor lighted sand volleyball courts and additional recreational playing fields.

Residence Halls

Occupying a prominent place on College Hill is a complex of three large residence halls: **Rush H. Kress Hall, Main College**, and **Harland A. Trax Hall.** Main College has been designated as Daniel C. Roberts Hall in memory of the man who provided funds for its rebuilding in 1937. Roberts Hall, Bucknell University's oldest residence hall, underwent a $13.7 million renovation in 2016 to restore some of its original splendor while meeting modern code and comfort standards. The renovation included providing air conditioning, elevator installation and ADA accessibility to most of the building, as well as upgraded safety systems, including fire alarms, sprinkler systems, and BUID card access. It provides housing for 136 students, primarily sophomores, in two, three and four-person suites, each with a private bathroom and shower. The building is LEED Silver certified. Nearby Kress Hall is named in honor of Rush H. Kress, Class of 1900, for 36 years as a University trustee and the generous contributions to his alma mater. Trax Hall, built in 1907, is named for a trustee and benefactor, Harland A. Trax. Most rooms in Kress and Trax, which together accommodate 230 students, are singles.

Gateway Residence Center. Completed in 1986, these five buildings – Kalman-Posner Hall, Malesardi Hall, Roser Hall, Silbermann Hall and Vidinghoff Hall – accommodate a total of 250 upper class students. Each floor contains four apartments, with each suite accommodating four students. Apartments contain four private bedrooms, a living room, a kitchen and full bathroom facilities. Common laundry facilities are available within the center. On-grade suites are available for students with disabilities. Kalman-Posner Hall was renovated in 2017 and 2023, Malesardi Hall and Silbermann Hall in 2022, and Roser Hall and Vidinghoff Hall in 2023.

Larison Hall, renovated in 1995, is a large residential building connected on the west with Bucknell Cottage, renovated in 2010, and on the south with John Howard Harris Hall. Together they accommodate 275 residents. Nearby **Hunt Hall**, built in 1928, which houses some 150 students, is named in honor of former President Emory W. Hunt and provides private residence rooms and common facilities for Bucknell's sororities. The building was completely renovated in the spring semester of 2003.

McDonnell Hall, with 300 beds, opened in fall 2000. Two four-story wings are connected by corridors to a two-story center unit containing lounge areas and seminar rooms. Each floor houses two "neighborhoods" with one single and nine double rooms surrounding a common lounge. McDonnell Hall is named in honor of Elizabeth and James McDonnell III and their daughter, Katherine '94.

Smith Hall. Completed in 1986, this modern residential unit houses approximately 220 students in a three-story building that contains a wide array of common facilities, including seminar and study rooms, computer facilities, TV lounges and common kitchen and laundry facilities. The building is named in honor of Robert '39 and Margaret Farrell Smith '41.

James S. Swartz Hall, near the Malesardi Quadrangle, is named for a longtime member and chairman of the Board of Trustees, and generous benefactor. Built in 1954, it houses 360 residents. Two wings of the hall were renovated in 2007; another wing was renovated in 2016, and the remaining wing was renovated in 2017.

Vedder Hall, completed in 1965, is named in honor of Lee N. and Grace Q. Vedder in recognition of the transfer to the University of the assets of the foundation that they endowed. It is home to more than 350 residents, most of whom live in double rooms. The building was completely renovated during the spring and summer of 2022.

Bucknell West/West Apartments, a complex of 35 individual modular units, was established in four phases from 1974 to 1984. In December 2022, 14 of the modular housing units were razed, and two apartment-style residence halls with space to house 140 students opened in fall 2023. In December 2023, 16 additional units were razed in phase two of the project, making space for two more apartment-style residence halls, which opened in fall 2024, housing an additional 140 students. In December 2024, the final five modular units were razed to provide space for a fifth building. This new four-story building will provide housing for 94 more students. Each apartment consists of four single bedrooms, a kitchen, a bathroom, and a living area. It is anticipated that each of the five buildings will receive Leadership in Energy and Environmental Design (https://www.usgbc.org/leed/) (LEED) Silver Certification.

South Campus Student Apartments, a complex of four apartment-style residence halls on the south part of campus, opened in fall 2015 and received Leadership in Energy and Environmental Design (https://www.usgbc.org/leed/) (LEED) Gold certification. The four buildings, totaling 151,000 square feet, are comprised of 344 beds in 88 apartments to house 340 juniors and seniors. Each apartment building has a first-floor "hearth space" to promote student interaction and living-learning opportunities, and recreational facilities, including an outdoor basketball court and two volleyball courts.

South Campus Affinity Houses, four small residential facilities, include two that opened in 2012 and two that opened in 2017. These residential facilities are occupied by the Lambda Chi Alpha (LCA) and Sigma Alpha Epsilon (SAE) fraternities as well as one Affinity House and one residence hall. Each of these 12,500-square-foot buildings contains 26 single bedrooms, as well as a first-floor chapter room, a catering kitchen, a large dining and event space and laundry facilities. The first floor of each building, including bathrooms and three bedrooms per house, are ADA-accessible. All four buildings received LEED Silver certification. A concrete staircase between the Affinity Houses and the South Campus Apartments was added in 2017 to enhance connectivity of these residences with the rest of campus.

Other Facilities

In 2010, the University moved the bookstore operation from the Elaine Langone Center to a renovated historic building on Market Street in downtown Lewisburg and partnered with Barnes & Noble to create the **Barnes & Noble Bookstore at Bucknell University**.

The Campus Theatre, a historic Art Deco-style movie theatre constructed in 1941, was acquired by the University in 2010. The building was renovated and the original interior artwork restored. The facility continues to show movies to the public as well as hosting special community events and academic-related films for specific classes.

In 2010, the University purchased the former **Federal Court House** building in Lewisburg, which was vacant except for the post office operation. The building has been renovated into offices for the University's development staff and continues to house the post office window service operation.

In 2012, the University renovated the **DeWitt Building** on Market Street. The Small Business Development Center and the Bucknell University Entrepreneurs Incubator are located on the upper floors, and the Downtown Gallery as well as two local businesses are located at street level.

The Walter C. Geiger Physical Plant Building, constructed in 1938 between Tustin and the Power Plant, was named for Walter C. Geiger '34, who served as superintendent of buildings from 1946-1957 and physical plant director from 1957-1978. It houses the facilities offices, garages for utility vehicles, several trade shops and a small storage area.

The Forrest D. Brown Conference Center, about seven miles from the campus, is used primarily for conferences and informal gatherings. It was named in 1966 in honor of the man who served for 30 years as secretary and adviser for the University's Christian Association. The center provides overnight accommodations for 60 people. Facilities include a kitchen, an outdoor covered picnic pavilion and 40 acres of open area for outdoor recreation. A "Challenge Course," consisting of low and high rope elements as well as a climbing and rappelling tower, was added in fall 2004.

The University also owns a **70-acre Nature Site** bordering Chillisquaque Creek a few miles from the campus. The property is used in laboratory work under the environmental science program but also is open to all members of the University community for research or visiting.

One of the historic buildings on University Avenue, the **Robert Lowry House** immediately opposite the President's House, was renovated to provide campus administrative offices. The home was built in 1856 by the Rev. Joseph P. Tustin, then secretary of the Board of Trustees. Robert Lowry wrote some of his most famous hymns during his residence in the house from 1869-1875. The home was later acquired by William C. Bartol, a distinguished member of the faculty from 1881-1928, from whose heirs the University purchased the property in 1984.

The Seventh Street Café, built in 1948 as a student recreation center with a snack bar called the Bison, later served as a psychology lab, a biology lab, and a piano lab until 1993, when it was renovated and renamed. The building, which includes exterior and interior student lounge areas and a coffee bar, also contains a craft center called the Seventh Street Studio, which has a studio and a MakerSpace annex. These two areas are equipped with a wide range of traditional and modern tools. The studio area has five pottery wheels, two kilns, nine sewing machines, a black and white darkroom, and an array of materials. The MakerSpace annex includes high-tech fabrication machines such as 3D printers, a laser cutter, 3D scanners, a vacuum former, a vinyl cutter, a CNC router and various woodworking tools.

Stuck House, located between the Seventh Street Café and Smith Hall and formerly the home of Bucknell's rabbi, was renovated in 2016 and now houses student offices, including the Bucknellian, the weekly student newspaper, and VIA Studio at Bucknell University, a student radio station that streams online under the name VBU Streaming.

Bucknell Co-Generation Power Plant was completed in 1998 with an accompanying Chiller Plant Annex added in 2020 that provides most of the electricity and all of the steam needed by the campus, as well as chilled water to support much of the campus' air-conditioning needs in a fuel-efficient and environmentally responsible manner. In addition, Bucknell supports the development of renewable energy through the purchase of wind-produced electricity and student-operated solar photo-voltaic arrays that provide electricity to the Bucknell University Center for Sustainability & the Environment. A 1.7-megawatt solar array was also completed in 2022 that supplies approximately 7 percent of campus electrical needs.

The **MacDonald Commons** building, completed in 2015, contains a large multipurpose space and several meeting rooms for use by students, as well as a small dining facility and convenience store. The building was the first on campus to receive LEED Gold certification.

Office of Accessibility Resources

Office of Accessibility Resources (OAR)

The Office of Accessibility Resources exists to ensure access, provide support, and help to navigate or remove barriers for students. Our office is committed to providing a strong support system for students with disabilities, and is committed to ensuring that no otherwise qualified student with a disability will be denied participation in or the benefits of any of our programs on the basis of a disability. The Office of Accessibility Resources will provide reasonable accommodations to students who meet the criteria of an individual with a disability from the Americans with Disabilities Act (http://www.ada.gov/) and its amendment (ADA, 1990, ADAAA, 2008).

It is the responsibility of the student with a disability to self identify to the director of the Office of Accessibility Resources (OAR) and provide documentation. When the student and director meet, they will discuss the appropriate and reasonable accommodations that may benefit the student in the classroom, the campus community or other areas. Given the many types, dimensions and complexities of disabilities, reasonable accommodations will be determined on an individual basis.

Academic Accommodations

The director of the Office of Accessibility Resources will work with you concerning your individual academic needs. Learn more about academic accommodations, including details about *Testing Accommodation, the* OAR Testing Center *(*https://www.bucknell.edu/life-bucknell/diversity-equity-inclusion/accessibility-resources/accessibility-resources-students-9/*),* Alternative Format for Printed Materials *(*https://www.bucknell.edu/life-bucknell/diversity-equity-inclusion/accessibility-resources/accessibility-resources-students-7/*), and* Note-Taking Accommodation *(*https://www.bucknell.edu/life-bucknell/diversity-equity-inclusion/accessibility-resources/accessibility-resources-students-8/*).*

Dining & Food Allergy Accommodations

Bucknell University understands how challenging dining with dietary needs and allergy concerns can be. A student with a dietary need or allergy concern will need to work closely with Bucknell Dining Services and/or our registered dietician.

Housing Accommodations

Bucknell University recognizes that some students may require exceptions to its housing assignments as a reasonable accommodation for a documented disability. The University has procedures in place to work with students making such requests.

Service Animals/Emotional Support Animals (ESA)

Bucknell University recognizes the importance of service animals to individuals with disabilities and provides policy to govern the presence of service animals on campus.

The University also recognizes the importance of emotional support animals (ESA) to individuals with mental health disabilities and has established policy to govern the presence of emotional support animals on campus.

Temporary Impairment/Injury Accommodations

The Office for Accessibility Resources offers a wide variety of services to students with temporary, documented disabilities.

Facilities for Students with Disabilities

Campus Accessibility

Bucknell University endeavors to create an environment throughout our campus that is barrier-free to the maximum extent possible. Buildings on campus vary in degree of accessibility for people with physical disabilities. In compliance with the Americans with Disabilities Act Standards for Accessible Design and the Pennsylvania Code, new buildings and major renovations are designed as accessible facilities. Residential facilities include several barrier-free accommodations in a variety of housing options.

To schedule a meeting or for questions concerning accessibility issues/needs, please contact the Office of Accessibility Resources at 570-577-1188 or oar@bucknell.edu (hf007@bucknell.edu).

Crime, Fire Safety & Campus Emergency Information

The Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act (Clery Act) is a federal law requiring all institutions of higher education that participate in the federal student financial aid program to disseminate a public, annual security report to employees and students. The annual report must include campus crime statistics for the preceding three calendar years and policy statements regarding (but not limited to) crime reporting, campus facility security and access, law enforcement authority, incidence of alcohol and drug use, and prevention of/response to sexual assault, stalking, dating violence and domestic violence.

The Clery Act is enforced by the U.S. Department of Education and campuses that fail to comply may be subject to financial penalties and other penalties up to and including possible suspension from participation in federal financial aid programs. To be in full compliance with the requirements of the Clery Act, Bucknell must:

1. Publish its Annual Security Report to all current students and employees no later than Oct. 1 of each year.

2. Prospective students and employees must also be informed about the availability of the report. The report must include crime statistics for the preceding three calendar years, and safety and security related policy statements, campus crime prevention programs, and a list of procedures to be followed in the investigation and review of alleged incidents of sexual assault, stalking, dating violence or domestic violence.

3. Keep and make available a log of all crime reported to the Department of Public Safety within the most recent 60 days.

4. Disclose missing student notification procedures relating to students residing in campus housing.

5. Disclose fire safety information for on-campus housing. Bucknell includes within the Annual Clery report fire statistics and has a combined Annual Security and Fire Report (ASFR)

The Annual Security and Fire Report (ASFR) also addresses requirements for institutions established by the Violence Against Women Act in regard to rights afforded to survivors of sexual assault, stalking, dating violence and domestic violence. Bucknell University is in full compliance with this law and such information is available to you in writing, upon request, at the Department of Public Safety building or on the Bucknell University Public Safety website at bucknell.edu/CleryAct (https://www.bucknell.edu/media/22840/).

ACADEMIC STANDARDS & POLICIES

Awarding degrees is based on requirements established by the faculty. The faculty also adopted additional rules and policies related to those requirements that support the standards and the integrity of Bucknell and its academic program.

- ACADEMIC RESIDENCY (https://mybucknell.policystat.com/policy/token_access/49bd69ec-317f-4e5c-ad6a-a3300ae9ed02/)
- ACADEMIC RESPONSIBILITY (https://mybucknell.policystat.com/policy/token_access/cc1db856-d994-4165-bdab-2cafde2cf846/)
- ACADEMIC STANDING (https://mybucknell.policystat.com/policy/token_access/701dc071-ba55-4709-ae5c-ed7c35950efe/)
- ADVANCED PLACEMENT & CREDIT (https://mybucknell.policystat.com/policy/token_access/8401383b-20da-44f0-9c02-06423bd04a53/)
- CLASS ATTENDANCE (https://mybucknell.policystat.com/policy/token_access/d463e658-3586-4ff2-be08-a5786103ccd3/)
- COLLEGE LEVEL EXAMINATION PROGRAM (CLEP) (https://mybucknell.policystat.com/policy/token_access/fdc06e73-8ae0-4a60-b78d-452c56375ac6/)
- COURS (https://mybucknell.policystat.com/policy/token_access/7ca0007a-42a0-437f-a652-4f2291f99ea9/)E CREDIT (https://mybucknell.policystat.com/policy/token_access/7ca0007a-42a0-437f-a652-4f2291f99ea9/)
- COURSE LOAD & ENROLLMENT STATUS (https://mybucknell.policystat.com/policy/token_access/b4b6a397-9e8b-4750-af2c-b9fed0ff3445/)
- WITHDRAWAL, LEAVE OF ABSENCE, SUSPENSION & EXPULSION (https://mybucknell.policystat.com/policy/token_access/358b00fb-234b-4165-968f-764d2a5fdc37/)
- COURSE REGISTRATION & WITHDRAWAL (https://mybucknell.policystat.com/policy/token_access/885e7b83-3c06-4568-af43-43958fab77b0/)
- CREDIT BY EXAMINATION (https://mybucknell.policystat.com/policy/token_access/1cf86283-8d55-47e4-a0a2-aa909e59b53a/)
- DECLARATION OF A MINOR (https://mybucknell.policystat.com/policy/token_access/15f8e030-c217-4a66-9c3f-70945d610730/)
- DEGREE & GRADUATION REQUIREMENTS (https://mybucknell.policystat.com/policy/token_access/41a918ae-b2a2-416e-9e97-1dfa5181e3e7/)
- DOUBLE COUNTING COURSES (https://mybucknell.policystat.com/policy/token_access/8e8ed004-5b81-4f36-a46e-c84ccee5af82/)
- FINAL EXAMINATION POLICY (https://mybucknell.policystat.com/policy/token_access/b56a8784-5f23-4a89-86f9-df1a12694284/)
- GRADE APPEALS (https://mybucknell.policystat.com/policy/token_access/76e076a2-1200-4b5c-8a38-cbf68de712f7/)
- GRADE REPLACEMENT (https://mybucknell.policystat.com/policy/token_access/8f606680-edb6-4cc7-bc92-73ed80ea880f/)
- INCOMPLETE GRADES (https://mybucknell.policystat.com/policy/token_access/ef6c0bc9-8578-4afb-8596-40c83c08da38/)
- INTERNATIONAL BACCALAUREATE & CAMBRIDGE INTERNATIONAL A LEVEL CREDIT (https://mybucknell.policystat.com/policy/token_access/da985b14-d68b-4934-8c1e-10bc9b3dcfa7/)
- PREFERRED NAME & DIPLOMAS (https://mybucknell.policystat.com/policy/token_access/1782d575-946a-4fde-9165-8d863358a41f/)
- SUPERIOR ACADEMIC ACHIEVEMENT (https://mybucknell.policystat.com/policy/token_access/0ee4e1c1-400b-4f31-ac3f-7475ae00a6b1/)
- TRANSFER OF ACADEMIC CREDIT (https://mybucknell.policystat.com/policy/token_access/4496e6c9-9bdb-4f79-96f5-36a9d360316b/)

ADMISSIONS

Academic Requirements

Minimum requirements for various course areas as they relate to prospective major and non-major studies include:

Requirements for All Applicants

Students should strive to take 5 core classes each year with the minimum requirements per subject area listed below:

4 years of English/language arts

3 years of college preparatory mathematics

3 years of science

3 years of history/social studies

2 years of a foreign language (in the same language) in secondary school. American Sign Language counts toward this requirement. Please note that coursework taken before the ninth grade does not count toward the two-year requirement.

Exceptions to the above may be made at the discretion of the dean of admissions or the Admissions Committee.

Requirements in Mathematics

Students planning to take calculus at Bucknell University, including all students majoring in mathematics, science, engineering, accounting, business analytics, data science or economics, are required to have additional preparation, including a year of precalculus, and preferably, calculus. The term "college preparatory mathematics" denotes a logical sequence of topics, including algebra and geometry, with emphasis on basic concepts and principles of deductive reasoning. The term "precalculus" denotes the study of polynomial, rational, trigonometric, logarithmic and exponential functions. The term "calculus" denotes the study of transcendental functions; interpretation, significance and calculation of a derivative; and introduction to the definite integral.

Requirements in the Sciences for Engineering Applicants

Engineering applicants are required to have one year of either chemistry or physics, however, Bucknell strongly recommends a minimum of three years of science, including both chemistry and physics.

Bachelor of Arts in Music or Bachelor of Music Applicants

Students who are applying to pursue a Bachelor of Arts in Music or a Bachelor of Music degree must complete a two-part screening and audition process. Information regarding the materials required for the screening process, as well as deadlines and general notification and registration guidelines, are available at bucknell.edu/academics/college-arts-sciences/academic-departments-programs/music/auditions-what-expect (https://www.bucknell.edu/academics/college-arts-sciences/academic-departments-programs/music/auditions-what-expect/).

Advanced Standing for First-year & Transfer Students

First-year students

Applicants who earn the equivalent of eight or fewer Bucknell University course credits at another college while in high school shall only be considered for admission as first-year students. These students will be required to comply with University curricular and cocurricular programs and policies for entering first-year students.

Credits can be earned through College Board Advanced Placement (AP), International Baccalaureate (IB), or college courses taken while in high school. Students earning any of these credits may attend Bucknell for eight semesters (or 10 semesters if they are enrolled in a five-year engineering program).

Students who have earned more than eight course credits but admitted as first-year students should consult with the associate dean of their respective college after admission is offered to determine which courses they should select for transfer.

Students interested in transferring more than the equivalent of eight Bucknell University course credits shall be considered for admission only as a transfer student. These students will not be eligible for, or required to comply with, University curricular and cocurricular programs and policies intended for those entering college immediately after high school. The graduation dates of these students will be adjusted to reflect their prior work. The graduation date, or class year, determines the number of semesters a student may attend Bucknell. When necessary, the appropriate college dean may adjust a student's graduation date due to curricular needs.

Transfer students

Students who have graduated from high school and have matriculated in a degree-seeking program elsewhere will only be considered for admission as a transfer student. There is no minimum number of courses or credits required to be eligible to transfer. Students with less than four accepted transfer credits will be eligible for, and required to comply with, University curricular and cocurricular programs for first-year students.

Students will not be admitted to Bucknell's undergraduate program if they have earned the equivalent of more than 80 semester hours or 2.5 years of college work elsewhere. This limit includes credits earned through Advanced Placement, International Baccalaureate and College Level Examination Program subject tests.

While the preceding policies apply in most situations, exceptions may be made by the Office of Admissions after considering an applicant's particular circumstances and consulting with the Office of the Registrar; the deans of arts & sciences, engineering or management; and student affairs.

Students applying for transfer admission are typically expected to have a grade point average of at least 3.0 (on a 4.0 scale). The average GPA of admitted transfer students is 3.4. Courses will be credited if they are comparable to those offered at Bucknell, if they may be counted toward the requirements for graduation, and if a grade of D or better was earned. A grade of D- or below, pass/fail grades, or audited courses will not be accepted for transfer credit. Courses in professional or vocational fields, math courses lower than introductory calculus, and language courses that repeat high school work are not acceptable for transfer. Courses taken online at regionally accredited universities will be considered for transfer credit at the discretion of the department chair.

Most students transfer to Bucknell from schools employing the semester hour credit system. For schools on a semester hour system, four semester hours are equivalent to one Bucknell course credit. For schools on a quarter credit hour system, six quarter hours are equivalent to one Bucknell course credit. All courses that are three semester hours or four to five quarter hours transfer as .75 Bucknell course credit; courses that transfer as .75 credit may be used to satisfy requirements.

The grade point average required for good standing and for graduation is compiled only on work taken at Bucknell. Applicants for admission with advanced standing must provide the dean of admissions with an official transcript of record that reflects all earlier college work and any other requested information.

In highly structured programs, such as those leading to the bachelor of music degree, the bachelor of science degrees, and the bachelor of engineering degrees, the sequence of courses is very important. Potential transfer candidates interested in these areas should contact the Office of Admissions as early as possible for advice on selecting courses where they are currently enrolled.

To satisfy Bucknell's graduation requirements, undergraduates in the College of Arts & Sciences and Freeman College of Management must complete a minimum of 12 Bucknell University courses, and in the College of Engineering, a minimum of 13. A minimum of two semesters in residence during the junior and senior years is also required. The first semester after matriculation and the final semester before graduation must be in residence.

Applying for Admission

To apply for admission as a first-year student, please use the Common Application available at commonapp.org (http://www.commonapp.org), or Coalition Application (powered by Scoir) available at app.scoir.com/app/signup/1100235 (https://app.scoir.com/app/signup/1100235/). For your application to be complete, you must submit the following:

- Common Application or Coalition Application (powered by Scoir), including the nonrefundable $50 application fee or fee waiver request.
- All supporting materials, which include:

    - Questions specific to Bucknell University;
    - The personal essay (no supplementary essay is required);
    - Secondary School Report and school counselor evaluation;
    - Official transcript from each high school attended;
    - At least one teacher recommendation, preferably from a core subject; and
    - The Mid-Year Report, when available.
- SAT or ACT scores, if the applicant chooses to include them on the application (SAT/ACT writing sections are not required; ACT science section not required). Applicants may self-report SAT/ACT scores on their Common or Coalition Application (powered by Scoir) for admissions consideration. If an applicant is offered admission and enrolls, an official copy of the SAT/ACT scores will be required.
- In the academic year 2019-2020, Bucknell began a five-year, test-optional pilot program for which students are not required to submit an SAT or ACT score as part of their application. For the 2019-2020 application cycle, home-schooled students, international citizens and recruited athletes were required to submit SAT or ACT scores. Starting in the 2020-2021 application cycle through the remainder of the pilot program, all applicants may choose to be test optional. However, all students who choose to enroll at Bucknell will be required to submit an SAT or ACT score before they begin their first year. These scores will only be used in the assessment of the test-optional program and will not impact the admission decision already made. Note: If you have never taken the SAT or ACT and do not have scores available, you will not be required to submit a score upon enrollment. In the spring 2023 semester, it was determined to extend the test-optional pilot through the 2025-2026 application cycle.
- Test of English as a Foreign Language (TOEFL), International English Language Testing System (IELTS), Pearson Language Tests (PTE), or Duolingo English Test (DET) if English is not your first language or if it was not the primary language of instruction for at least three years of your secondary school education.
- Early Decision applicants must submit the Common Application or Coalition Application (powered by Scoir) Early Decision Agreement form, including all required signatures (applicants, parent/guardian and school counselor).
- CSS PROFILE (https://cssprofile.collegeboard.org/) and Free Application for Financial Aid (https://studentaid.gov/h/apply-for-aid/fafsa/) (FAFSA), if you are applying for financial aid.
- The merit scholarship application, if you're applying for merit scholarships (https://www.bucknell.edu/admissions-aid/tuition-fees-financial-aid/scholarship-programs/).
- All international applicants must submit a certified bank statement with either the International Student Application for Financial Assistance (ISAFA) if applying for financial aid, or the Financial Certification Document if not applying for financial aid.

If you are applying as a transfer student, you must submit:

- Coalition Application (powered by Scoir) for transfer students, including the nonrefundable $50 application fee or fee waiver request.
- All supporting materials, which include:
    - Questions specific to Bucknell University;
    - The personal essay (no supplementary essay is required);
    - Coalition Application Recommendation;
    - Coalition Application Transfer Report;
    - Coalition Application College Curriculum Report;
    - College Coursework in Progress Form;
    - Official transcript for each college attended;
    - Official secondary school transcript;
    - SAT or ACT scores (optional). Students who choose to submit test scores may self-report them on their Coalition Application (powered by Scoir) for admissions consideration. If an applicant is offered admission and enrolls, an official copy of the SAT/ACT scores will be required; and
    - Test of English as a Foreign Language (TOEFL), International English Language Testing System (IELTS), Pearson Language Tests (PTE), or Duolingo English Test (DET) scores, if English is not your first language or if it was not the primary language of instruction for at least three years of your secondary school education.

- CSS PROFILE and Free Application for Financial Aid (FAFSA), if you are applying for financial aid.
- All international applicants must submit a certified bank statement with either the International Student Application for Financial Assistance (ISAFA) if applying for financial aid, or the Financial Certification Document if not applying for financial aid.

If you applied previously to Bucknell, the application fee may be waived and the official secondary school report may be retrieved.

Decision Plans

First-year students

Bucknell University offers Early Decision I with an application deadline of Nov. 15, and Early Decision II and Regular Decision with an application deadline of Jan. 15.

If Bucknell University is a student's first choice, Early Decision allows students to receive an admission decision within four to five weeks of the application deadline. If the student is accepted under an early decision plan, the student must promptly withdraw the applications submitted to other colleges and universities and make no additional applications to any other university in any country. If the student is an early decision candidate and is seeking financial aid, the student need not withdraw other applications until the student has received notification about financial aid from Bucknell. Decisions for Early Decision applicants include admit, defer to Regular Decision for later consideration, or deny. Admitted applicants are required to submit a $500 nonrefundable enrollment deposit by the date indicated in their admission letter, typically within one month of the admission notification.

Regular Decision applicants receive notification by April 1. Decisions for Regular Decision applicants include admit, wait list for later consideration, or deny. Early Decision applicants deferred to Regular Decision will either be admitted or denied admission. Admitted applicants who decide to enroll are required to submit a $500 nonrefundable enrollment deposit by May 1.

Transfer students

Students may transfer to Bucknell for either the fall or spring semester.

The application deadline for the fall semester is March 15; for the spring semester, the deadline is Nov. 1. All supporting documents are required by the stated deadline.

Admitted applicants who decide to enroll are required to submit a $500 nonrefundable enrollment deposit by the date indicated in their admission letter.

Find out more about the application process at bucknell.edu/apply (http://bucknell.edu/apply/).

Entrance Deferral

A student may elect to defer enrollment for one or two years after being admitted. Requests must be submitted in writing using the defer request form (https://admissions.bucknell.edu/register/?id=c5a8e1d5-3fe0-4a95-961d-3825dc36943f) any time between receipt of an offer of admission and June 1. A nonrefundable deposit will be required to hold this space. Deferrals are typically granted to students who desire to engage in personal enrichment or community service activities. Students may not request a delay in their Bucknell enrollment to attend a secondary school, college or university full time. Requests may be declined for any reason.

Health Insurance Requirement

All full-time undergraduate students and graduate students attending Bucknell University must enroll in or waive out of the health insurance coverage offered through the University. All students (except international students, see below) providing verifiable proof of comparable coverage may waive the purchase of the sponsored plan. Students failing to submit proof of coverage or whose plans do not provide comparable coverage will be automatically enrolled in the plan offered by the University at the end of the enrollment period. Students will receive information regarding the University-sponsored plan through a summer mailing. Information will also be available in the students' *my*Bucknell portal beginning in early August.

To complete registration for fall semester classes, the online waiver/enrollment form must be completed before the start of classes.

Bucknell University requires all international students to purchase the University-sponsored medical insurance program. The premium for this coverage is automatically charged to the student's account and enrollment is automatic. There is also coverage available for dependent spouses and children that can be purchased through the school-sponsored plan.

Integrity of Application Process

Each applicant is required to certify that any and all information furnished to the University is accurate and complete. In addition, any material submitted (including but not limited to the application itself, essays and supplemental materials) must be the applicant's original work. Any applicant for admission or financial aid who knowingly submits false or fraudulent information, conceals material information, or intentionally misleads or

misinforms the University, may be subject to actions including (but not limited to) denial of admission, revocation of an award of financial aid and repayment of dispersed funds, dismissal from the University, revocation of admission or revocation of a conferred degree.

The Bucknell Admissions Office practices holistic application review. While the rigor of curriculum and performance/grades a student receives are incredibly important, the admissions committee also considers how a student engages with extracurricular activities, their community and home life, personal essay, questions specific to Bucknell University, secondary school report and school counselor evaluation, teacher recommendation(s), SAT or ACT scores (if the applicant chooses to include them on the application), scores from an English language proficiency exam (if required), and how a student may bring a diverse perspective or contribute to the University's goal of creating an equitable and inclusive community. Race is not considered as a factor in any admission decisions.

STATEMENT ON ARTIFICIAL INTELLIGENCE: Tools like ChatGPT and other AI-based programs are making a significant impact on society and various industries. We believe that these tools can help you generate ideas for your application, but ultimately everything you submit as part of your application to Bucknell should be your own. You should not copy and paste content into your application that you did not create. If you choose to utilize AI–based programs, we encourage you to rely on them as you would a teacher, family member or friend — for brainstorming, editing and honing your work.

Medical Requirements

All full-time domestic, international and summer students entering Bucknell must submit the Bucknell Student Health Medical History and Physical Examination Form completed by their medical provider. Students are required to complete a QuantiFERON Gold blood test and be up to date on the required immunizations stated on the form.

All graduate students who will be using Student Health for their primary care must submit the Bucknell Student Health Medical History and Physical Examination Form completed by their medical provider. All graduate students who are not using Student Health for their primary care are required to complete the required immunixations and a QuantiFERON Gold blood test 6 months before the first day of classes.

Qualifications for Admission

Bucknell University's admissions process is highly selective, as the University receives many more well-qualified applicants than it has spaces available in each incoming class. The admissions committee's review process includes:

- Quality of the admissions application.
- Secondary school record, including rigor of curriculum and performance.
- SAT or ACT test scores, if the applicant chooses to include them on the application. In the academic year 2019-2020, Bucknell began a five-year test-optional pilot program for which students are not required to submit an SAT or ACT score as part of their application. For the 2019-2020 application cycle, home-school students, international citizens and recruited athletes were required to submit an SAT or ACT score. Starting in the 2020-2021 application cycle through the remainder of the pilot program, all applicants may choose to be test optional. In the spring 2023 semester, it was determined to extend the test-optional pilot through the 2025-2026 application cycle.
- Test of English as a Foreign Language (TOEFL), International English Language Testing System (IELTS), Pearson Language Tests (PTE), or Duolingo English Test (DET) scores if English is not your first language or if it was not the primary language of instruction for at least three years of your secondary school education.
- Written recommendations.
- School and community activities.
- Indication of special talents.
- Evidence of strong personal qualities of character and leadership.

The admissions committee is interested in applicants with the intellectual capabilities, academic preparation and sincere interest in contributing to Bucknell's residential and diverse learning community.

Readmission

A student who has withdrawn voluntarily from Bucknell University and has attended another college or university without the permission of the appropriate college dean at Bucknell must submit an application for readmission to the Office of Admissions under the regulations governing transfer students.

Standardized Tests

In the academic year 2019-2020, Bucknell began a five-year pilot program for which students are not required to submit an SAT or ACT score with their application. For the 2019-2020 application cycle, home-schooled students, international citizens and recruited athletes were required to submit an SAT or ACT score. Starting in the 2020-2021 application cycle through the remainder of the pilot program, all applicants may choose to be test optional.

However, all students who choose to enroll at Bucknell will be required to submit an SAT or ACT score before they begin their first year. These scores will only be used in the assessment of the test-optional program and will not impact the admission decision already made. Note: If you have never taken the SAT or ACT and do not have scores available, you will not be required to submit a score upon enrollment. In the spring 2023 semester, it was determined to extend the test-optional pilot through the 2025-2026 application cycle.

Applicants who chose to submit the SAT or the ACT (SAT/ACT writing sections are not required; ACT science section not required) examination may take the exam either in the junior year of high school or the fall of senior year. Applicants may submit self-reported SAT/ACT scores for admissions consideration. Should a student be admitted and choose to enroll at Bucknell, official SAT/ACT scores will be required after deposit. Test results may also be sent directly from a test organization to Bucknell University (SAT code 2050 and ACT code 3528). Information on the SAT is available at sat.org (http://www.sat.org) and on the ACT at actstudent.org (http://www.actstudent.org). Applicants do not need to complete the optional essay section on either the SAT or ACT.

Applicants for whom English is not the first language or whose primary language of instruction for at least three years of secondary school was not English are required to submit scores for either the Test of English as a Foreign Language (TOEFL), International English Language Testing System (IELTS), Pearson Language Tests (PTE), or Duolingo English Test (DET). The minimum recommended TOEFL score is 600 on the paper-based exam (PBT) or 100 on the internet-based exam (IBT). The minimum recommended score is 7 on the IELTS, 68 on the PTE Academic exam, and 130 on the DET. Information on the TOEFL is available at ets.org/toefl (http://www.ets.org/toefl/), the IELTS at ielts.org (http://www.ielts.org/), the PTE Academic at pearsonpte.com (http://pearsonpte.com/), and the DET at englishtest.duolingo.com (https://englishtest.duolingo.com/). Test results must be sent directly from the test organization to Bucknell University.

Visiting Bucknell

Visit campus to learn more about Bucknell's academic programs, resources and facilities. Visit options for prospective students and families include:

- Information session
- Campus tour
- Facility tour
- Seasonal open house programs
- Driving tour
- Self-guided tour
- Seasonal virtual visit options

Interviews are not part of the application process.

Find out more at bucknell.edu/visit (http://bucknell.edu/visit/).

Virtual options can be found on our Virtual Welcome Center (https://www.bucknell.edu/admissions-aid/virtual-welcome-center/).

FINANCIAL AID INFORMATION

Approximately 57 percent of Bucknell's undergraduate students receive Bucknell grants or scholarships. When other types of aid are considered – such as grants from sources other than the University, student loans and campus employment – about 65 percent of our undergraduate students receive some financial assistance in meeting their educational expenses.

Bucknell's grant and scholarship program is a mix of need-based grants and scholarships that do not necessarily require a student to have financial need. This blended approach provides the University with the flexibility to appropriately recognize the achievements of the best and the brightest students within our applicant pool. The majority of Bucknell aid is awarded to students with financial need, and these are reevaluated annually by considering family income, assets, number of members in the household, and number of children enrolled at least half-time in undergraduate degree-seeking programs. A limited number of scholarships will be awarded to students with no need or who do not apply for aid. Because we have an exceptionally talented pool of students applying for admission, all merit awards are extremely competitive.

First-year, need-based aid recipients will continue to receive assistance in subsequent years as long as they continue to demonstrate eligibility as determined by the Office of Financial Aid, maintain satisfactory academic and social standing with the University, and meet the specified financial aid application deadlines. If a family's financial situation remains essentially the same, a student's Bucknell aid should remain consistent over their four years at Bucknell University. However, changes in income, assets, and number of children below age 24 in the family who are enrolled at least half-time in undergraduate degree-seeking programs can increase or decrease need-based aid eligibility from year to year, so students will need to reapply for aid each year.

Withdrawals & Leaves of Absence

If you are a current financial aid recipient, please understand that when you withdraw, federal regulations require the Office of Financial Aid to calculate the percentage of the semester you completed to determine whether we must return any of your federal financial aid to the federal government and/or Bucknell financial aid to the University. As a result, it is possible that you will owe the University a balance because your financial aid eligibility will have changed. In addition, please be aware that federal loans that you have borrowed will go into repayment six months after you drop below half-time enrollment unless you are in an approved leave-of-absence status as defined by the federal government for Title IV financial aid purposes. However, the federal Title IV leave-of-absence definition is more stringent than the Bucknell leave-of-absence definition, so they are not the same. In the vast majority of cases, Bucknell leave of absence does not qualify as a federal Title IV leave of absence. Therefore, your official status to the federal government must be reported as a withdrawal and your loan repayment will begin six months after the effective date.

If you will be returning to Bucknell after a voluntary leave, health leave, or involuntary leave of absence, please be aware that you must reapply for financial aid each year. Although we cannot make guarantees, if you are eligible, we will do our best to provide financial aid to you. Our deadline for returning students is Feb. 15, so please be sure to complete your financial aid file by this date.

Types of Financial Aid

Financial aid packages usually consist of three aid types:

Scholarships/Grants

Scholarships/grants are gifts that do not have to be repaid. Funds for need-based grants and merit-based scholarships come from the University itself, as well as foundations, corporations, state agencies and the federal government.

Student Loans

Student loans are funds borrowed for educational expenses and must be repaid with interest by the borrower.

Campus Employment

Campus employment provides opportunities for students to earn funds for their educational expenses. Although students are not assigned specific jobs or placements by the Office of Financial Aid, financial aid recipients are often given preference in campus hiring. Financing for campus employment comes from the University and the federal government. Students who qualify for the Federal Work Study program have additional opportunities for employment in the area of community service.

Applying for Financial Aid

The **Free Application for Federal Student Aid (FAFSA)** is required each year for all federal financial aid programs such as the Federal Pell Grant, Federal Direct Loans and Federal Work-Study. The form can be found at studentaid.gov (https://studentaid.gov/), (http://www.fafsa.ed.gov) and Bucknell's FAFSA code is 003238. For **current/returning students**, our deadline is Feb. 15. For incoming first-year students, our deadlines are Nov. 15 for Early Decision 1, Jan. 15 for Early Decision 2, and Jan. 15 for Regular Decision. (For **incoming first-year students** who also wish to apply for Bucknell need-based financial aid, we require the CSS PROFILE – see below.)

The **CSS PROFILE** is required if you wish to be considered for Bucknell need-based financial aid, but you only need to file it once, the first time you apply for need-based aid. The form can be found at student.collegeboard.org/profile (http://student.collegeboard.org/profile/), and Bucknell's CSS

code is 2050. Our deadlines are Nov. 15 for Early Decision 1, Jan. 15 for Early Decision 2, and Jan. 15 for Regular Decision. If your biological parents are divorced or separated, your non-custodial parent must also complete and submit the **CSS Profile** by the same deadlines.

Accepted and enrolling incoming first-year students must also submit verification documents by our deadlines to be considered for need-based financial aid. For accepted and enrolling incoming first-year students, our deadlines are Nov. 15 for Early Decision 1, Jan. 15 for Early Decision 2, and Jan. 15 for Regular Decision. Current/returning students must submit these by Feb. 15.

Transfer student applicants must file the same documents as first-year students, but the CSS deadline is Nov. 1 for spring enrollment and March 15 for fall enrollment.

International incoming first-year students must complete and submit the Bucknell International Student Financial Aid Application located on our website. (International current/returning students do not have to file this form again.)

Please refer to our literature and website at www.bucknell.edu/FinancialAid (https://www.bucknell.edu/admissions-aid/tuition-fees-financial-aid/) for specific application information, types of financial aid and procedures.

All inquiries and questions regarding financial aid at Bucknell should be directed to the Office of Financial Aid.

Deposits & Refund Policies

Required Deposits

Admissions

All incoming students are required to make a nonrefundable deposit of $500 in accordance with the terms of the letter of admission to the University. This deposit will be credited to the student's first semester billing.

Other Deposits

Other deposits may be required of students enrolled in specific courses or programs.

Credit & Refund Policies

Tuition & Room Fees

Tuition and room fees will be credited to accounts of students who give written notification of withdrawal from the University, subject to the conditions that follow. The date of receipt of the written notice by the Office of the Registrar will be considered the official date of withdrawal. No credit of tuition or room fees will be made after the midpoint of the term or semester. No refund will be made if academic credit is earned. Prior to the midpoint of the term or semester, tuition and room fees will be credited as follows:

Timing of Withdrawal/Leave of Absence & Amount of Tuition & Room Fees Credit

- Prior to first day of classes: 100 percent credit.
- From first day of classes through the midpoint of the term or semester: The amount of credit issued will be reduced by two weeks of tuition and room fees for each week or partial week completed. (Please go here (https://www.bucknell.edu/azdirectory/bursar-services/financial-policies/) for specific dates on refund schedule.)
- After the midpoint of the term or semester: No credit will be issued.

Students may have to temporarily withdraw from Bucknell University because of accident and illness resulting in a loss of tuition payments. Certain insurance companies offer tuition refund plans as a way to help protect one's substantial financial investment in a college education. Bucknell encourages students and their families to investigate tuition insurance and consider whether coverage might be appropriate for them.

Student Fees

Student fees will be credited in full in the case of voluntary withdrawal, or voluntary or involuntary leave of absence before the first day of classes. No portion of the fees will be credited after classes begin.

For students **suspended or dismissed for disciplinary reasons**, the University will not issue credit for tuition or room fees.

Active Duty Withdrawal

Students who must withdraw because they are called to active duty and who receive no academic credit for the semester will receive a full tuition refund. If academic credit is awarded, the refund will be prorated according to the amount of that academic credit. The student fees also will be credited in full, and room fees will be credited based on the number of unused days.

Board Charges

Board charges are credited on the basis of the unused portion of a board contract for all withdrawals, suspensions and dismissals. Board charge credits are subject to a forfeit fee not to exceed $50.

For **off-campus or summer programs**, there will be no credit for the cost of personal services, travel expenses, supplies or services furnished by outside contractors that have been used prior to withdrawal or for which no credit is available to the University.

For **students other than full-time undergraduate students,** the "100 percent credit" period will extend through the end of the last day of the formal drop/add period.

University Housing Damage Charges

The University holds resident students responsible for any unassigned loss, damage, repair or replacement of the furnishings, doors, windows, walls, and the condition of the room during the term of occupancy. Furthermore, because living in a University residence is a privilege accompanied by certain responsibilities associated with community living, resident students assume responsibility for any unassigned loss or damage to any property in the public area (lounges, hallways, bathrooms, etc.) within the community. The costs associated with communal damages can be viewed on *my*Bucknell. However, individual room damages and unassigned damages occurring in communal areas are posted on a resident's account at the conclusion of each semester.

Refunds

Credit balances appearing on the student's B-bill account will be refunded in accordance with the following guidelines:

- Refunds will be issued when a credit balance actually exists on the student's B-bill account.
- If the total Title IV, HEA program funds credited to your account exceed the amount of tuition, room and board, you may authorize Bucknell University in writing or electronically to pay other current charges that were incurred at Bucknell for educationally-related activities. These charges may include books, supplies, etc., that were incurred either before or within 14 days of the credit balance occurring.
- If the credit balance is a result of excess payments, the credit balance will be refunded electronically to the student's refund account in B-bill upon their online request through *my*Bucknell.
- If a refund is not requested, the credit balance will remain on the account to help offset future charges.

Note: Specific credit and refund guidelines exist for students receiving financial assistance under Title IV of the Higher Education Act of 1965, as amended. This refund policy is included in its entirety later in the University *Catalog*. Questions concerning these guidelines should be directed by telephone to the Office of Financial Aid at 570-577-1331 or email finaid@bucknell.edu.

Financial Obligations

No student will be enrolled or graduated until all accounts have been paid or satisfactory arrangements have been made with the Office of Bursar Services.

Accounts are due by the date specified on the B-bill and are subject to a late fee of 1 percent of the outstanding balance each billing period until the account is settled.

A penalty fee of $25 will be charged for any payment made by check or online through B-bill if returned for insufficient funds. If any account is forwarded to our collection agency, the individual will also be responsible for paying any collection fees associated with the collection of this debt.

Bucknell University offers a Monthly Payment Plan administered by Nelnet Campus Commerce that is a budget plan that divides college costs into consecutive, monthly, interest-free installments. Additional information about the plan can be found on the Financial Aid website under Financing Options, or to apply, you may contact Nelnet at 800-609-8056 or mycollegepaymentplan.com/bucknell (https://mycollegepaymentplan.com/bucknell/). (Non-U.S. citizens also may apply for the payment plan.)

Return of Federal Student Aid

The federal government requires Bucknell University to publish a federal refund policy under Title IV of the Higher Education Act of 1965 as amended.[1] This refund policy sets guidelines for students who withdraw from the University if they receive financial assistance from the federal government.

Title IV funds (federal aid) are awarded to a student under the assumption that the student will attend school for the entire period for which the assistance is awarded. When a student withdraws (officially or unofficially), the student may no longer be eligible for the full amount of Title IV funds that the student was originally scheduled to receive.

When a federal financial aid recipient withdraws from a semester, federal regulations require a calculation to determine whether federal aid must be returned. This calculation, called a Return of Title IV (R2T4), is required for official withdrawals and for students who withdraw unofficially by ceasing attendance in all their classes. Bucknell University offers three standard terms per academic year, also referred to as payment periods: fall, winter/spring, and summer.

Federal regulations specify how Bucknell must determine the amount of Title IV program assistance you earn if you withdraw from school. The R2T4 calculation determines whether federal financial aid must be repaid to the federal programs. The university's tuition refund policy is independent of the federal R2T4 policy. Additionally, no leave of absence policy is used in the R2T4 process. For Title IV purposes, a leave of absence is considered a withdrawal.

The Title IV programs covered by federal regulations are: Federal Pell Grants, Iraq and Afghanistan Service Grants, TEACH Grants, Federal Supplemental Educational Opportunity Grants (FSEOG), Direct Loans, Direct Grad PLUS Loans, and Direct PLUS Loans.

The withdrawal date for students who officially withdraw is the day they begin the formal process. In the case of unofficial withdrawals, the withdrawal date is the last date of an academically-related activity. For example, academically-related activities might include taking a test, submitting a paper, or other substantial interaction with the instructor. If Bucknell cannot determine this date, the student's withdrawal date is the semester's midpoint.

Additional information of Return of Federal Financial Aid (and full policy) is available online at https://www.bucknell.edu/admissions-aid/tuition-fees-financial-aid/financial-aid-policies-faq (https://www.bucknell.edu/admissions-aid/tuition-fees-financial-aid/financial-aid-policies-faq/).

Questions should be directed to Bursar Services at 570-577-3733.

Note: A listing of tuition and fees for the academic year is available from:

Bursar Services
Bucknell University
Lewisburg, PA 17837

[1] Source: Federal Register/Vol. 85, No. 171/Wednesday, September 2, 2020.

ENDOWED FUNDS

This section includes a variety of endowments, including endowed and named chairs and faculty fellowships, as well as scholarships, that support numerous activities across the institution.

Endowed and Named Chairs and Faculty Fellowships

The David Burpee Chair in Plant Genetics was established in 1983 through the generosity of David Burpee, Bucknell trustee for more than 40 years. Incumbents of the chair will be selected to advance knowledge in plant genetics research.

The Claire W. Carlson Chair in Environmental Engineering was funded by gifts from Trustee Emerita Claire W. Carlson, Class of 1949. Those selected to hold this chair will lead students and faculty peers through teaching, collaborative research and scholarship in specialized and interdisciplinary study associated with environmental engineering.

The College of Arts & Sciences Dean's Fund for New Faculty Support was established as an endowed fund with a gift from anonymous donors. Income from the fund supports the recruitment and retention of talented new faculty in the College of Arts & Sciences who exhibit teaching excellence.

The John P. Crozer Chair of English Literature was established in 1865 and honors a faculty member known for outstanding scholarship in English literature. In 1856, John P. Crozer, a trustee of the University, gave Bucknell a substantial gift for the purpose of more fully founding and endowing the University.

The Alan R. Davis & Nancy J. Heim Davis Distinguished Visiting Professor Series in Mathematics was established through a bequest from Alan R. Davis, Class of 1968, and Nancy J. Heim Davis, Class of 1969. The fund shall be used to further scholarship in the field of mathematics by bringing distinguished visitors to Bucknell University to work with the faculty in the Department of Mathematics.

The Josephine Hildreth Detmer & Zareen Taj Mirza Professorship in Islamic Studies was created by gifts from Josephine H. "Dodie" Detmer, Class of 1952, and her daughter, Zareen Taj Mirza, Class of 1979. Income from the fund supports teaching, scholarship and research in Islamic studies.

The William H. Dunkak Chair in Finance in the Department of Business Management was established by William H. Dunkak Jr. in memory of William H. Dunkak. The chairholder will be included in the faculty of the Kenneth W. Freeman College of Management, and will be charged with teaching about and conducting, guiding and supporting personal and student research in the area of finance.

The David & Patricia Ekedahl Professorship in Environmental Studies was established in 2010 by David ’56 and Patricia Ekedahl. Those selected to hold this professorship will be appointed for terms of up to five years and charged to lead students through teaching and collaborative research and scholarship, and through collaboration with faculty peers and students in both specialized and interdisciplinary study of environmental issues, including human effects on the environment and environmental effects on human life and culture.

The William C. & Gertrude B. Emmitt Memorial Chair in Biomedical Engineering was established to honor the memory of these members of Bucknell’s Class of 1930 by their children: Virginia M. Chitwood, Class of 1959; Richard B. Emmitt, Class of 1967; and William C. Emmitt Jr., Class of 1969. The chairholder will be included in the faculty of the College of Engineering and will be charged with teaching about and conducting, guiding and supporting personal and student scholarship activity in the area of biomedical engineering.

The James & Elizabeth Freeman Chair in Management was established by Kenneth W. Freeman, Class of 1972, former chairman of the Bucknell Board of Trustees, and his wife, Janice W. Freeman, in honor of Ken's parents. The fund shall be used for distinguished faculty in the Freeman College of Management.

The Kenneth W. Freeman Professor & Dean of the College of Management was established in 2008 by Bucknell Trustee Kenneth W. Freeman, Class of 1972, and his wife, Janice W. Freeman. The fund shall be used for the deanship of the College of Management.

The Jane W. Griffith Faculty Fellowship was established by Jane W. Griffith, Class of 1943, in 2005. Fellowship grants from this fund are awarded to superior newly-hired faculty to support their research and professional academic development.

The John Howard Harris Chair in Philosophy honors a faculty member known for superior teaching and outstanding scholarship. The chair was established in 1925 in honor of the fourth president of Bucknell University. President Harris worked to build a faculty of superior teachers who maintain a high level of scholarship and was responsible for the expansion of the Bucknell curriculum to include professional and technical studies.

The Heinemann Family Professorship in Engineering was funded by a gift from Trustee Kirsten S. Heinemann, Class of 1981, and Steven D. Heinemann, dedicated parents of Andrew F. Heinemann, Class of 2012, and Erik Leister Heinemann, Class of 2015. The Heinemann Family Professorship will be held by a member of the faculty in the College of Engineering.

The Holmes Professorship in Management was created by gifts from Stephen P. '79 and Bonnie (Bencsko) '79 Holmes, parents of Bucknellians Kelly Eileen Karcher '06 and Kevin John Holmes '08. Income from the fund supports teaching and scholarship in accounting and financial management, including curriculum development, at the intersection of business and the arts.

The Kiken Family Chair in Management was funded by a gift from Norman P. Kiken, Class of 1964. Those selected to hold this chair will be charged to lead students and faculty peers through teaching, collaborative research and scholarship in study associated with the Freeman College of Management. Normally, the chair will be appointed for a renewable term of up to five years.

The Samuel H. Kress Professorship of Art History was created in 1967 by the Bucknell University Board of Trustees as a memorial to one of the leading patrons of the arts in the United States. It was funded through the sale of real estate given by the Samuel H. Kress Foundation after the death of Rush H. Kress, Class of 1900, a generous benefactor and Bucknell trustee for many years. Holders of the chair will be selected to recognize excellence in teaching and scholarship in the field of art history.

The Margaret Hollinshead Ley Professorship in Poetry & Creative Writing was established in 2010 by Margaret Hollinshead Ley, a member of Bucknell's Class of 1960. Those selected to hold this professorship will be appointed for potentially renewable terms of up to five years and charged with leading students from all disciplines, including math, the sciences, engineering and the social sciences, as well as the more traditional fields within the humanities, through inspirational teaching and the creative production of poetry and prose, and collaborating with faculty peers and students in the study of poetry and creative writing.

The Christian R. Lindback Chair in Business Administration was created by a gift from the Christian R. and Mary F. Lindback Foundation in 1960 in memory of Christian R. Lindback and in recognition of his sustained interest in faculty development in all disciplines of the University.

The John D. MacArthur Chair was established in 1981 with endowment funds from the John D. and Catherine T. MacArthur Foundation to assist in bringing new and promising faculty members to Bucknell. The professorship rotates from department to department every five years at the designation of the president.

The T. Jefferson Miers Chair in Electrical Engineering was established by gifts from Louise Matthews Miers, Class of 1926, to honor the memory of her husband, T. Jefferson Miers '26, by promoting outstanding faculty scholarship at Bucknell. Holders of the chair will be selected to recognize the excellence of their scholarship, teaching ability and their leadership in the field of electrical engineering.

The Sidney L. Miller Career Development Assistant Professor was established by Kenneth W. Freeman, Class of 1972, former Chairman of the Bucknell Board of Trustees, and his wife, Janice W. Freeman, in honor of Professor Emeritus Sidney L. Miller, who taught management at Bucknell for 19 years. Dr. Miller was a highly regarded teacher and mentor who pushed his students to strive for excellence and become deeply analytical thinkers. The fund shall be used for term professorships of distinguished early career faculty in the Freeman College of Management.

The National Endowment for the Humanities Chair in the Humanities was established in 1989 with funds from the National Endowment for the Humanities and honors an associate professor with a strong record of scholarship and teaching in the humanities at Bucknell University.

The Susan & Scott Perricelli Fellowship for Entrepreneurial Finance was created by gifts from Scott Perricelli '94 and Susan (Gegnas) Perricelli '94. Income from the fellowship will be used by the University to support the recruitment and retention of talented faculty whose scholarship and teaching focus on entrepreneurial finance and innovation in the Freeman College of Management. Classes supported through the fellowship will be open to all students interested in entrepreneurship.

The C. Graydon & Mary E. Rogers University Professorship was established in 2009 by C. Graydon and Mary E. Rogers, both members of Bucknell's Class of 1951. Grants from this fund are awarded to attract and retain superior new faculty by supporting their research, teaching and professional academic development. Those selected to hold this professorship will be appointed for five-year terms and charged to lead students through teaching, personal and directed student scholarship, and collaboration with faculty peers and students.

The Robert L. Rooke Chair in Engineering was created by a bequest from the estate of Robert L. Rooke, Class of 1913. Income from the fund supports teaching and research in the College of Engineering.

The Russell-Childers Professorship in the Laboratory Sciences was established in 2015 by a gift from Dr. Jean E. Russell and her husband, Robert R. Childers, and friends and donors to Bucknell University. Those selected to hold this professorship will be charged to lead students through teaching, collaborative research and scholarship in the laboratory sciences, including but not limited to biology, biochemistry, chemistry, geology, physics and neuroscience.

The Campbell Rutledge Jr. & Eleanor Rutledge Chair in Management was established by Kenneth W. Freeman, Class of 1972, former chairman of the Bucknell Board of Trustees, and his wife, Janice W. Freeman, in honor of former Trustee Campbell Rutledge Jr. '33 M'34 and his wife, Eleanor Rutledge. The Rutledges considered Bucknell students to be part of their extended family and were very active in the Corning, N.Y. community. The fund shall be used for distinguished faculty in the Freeman College of Management.

The Howard I. Scott Endowment was established in 1988 and principally funded by testamentary gifts from the estate of Howard I. Scott '39 as a memorial honoring his parents, Russell Lewis Scott and Bessie Harrison Scott. The endowment funds the Howard I. Scott Chairs and Professorships in Management, supporting teaching, scholarly research and lectures concerned with leadership, innovation and strategic management in the modern business world.

The Ruth Everett Sierzega Chair in Linguistics was established by Edward Raymond Sierzega to recognize excellent teaching and scholarship in linguistics and languages. The chair was established by Mr. Sierzega to preserve and honor the memory of his wife, Ruth, Class of 1945.

The Silbermann Family Professorship in Modern Hebrew Language & Literature was created by gifts from M. Steven and Julie A. Silbermann, both Class of 1978, and parents of Matthew E. Silbermann, Class of 2008, and Karen S. Silbermann, Class of 2012. Income from the fund supports teaching and research in Judaic studies.

The Herbert L. Spencer Professorship in Biology was established in 1970 as a memorial to Bucknell's eighth president (1945-1949) and executive director of the Samuel H. Kress Foundation, with a grant from the Kress Foundation.

The Swanson Fellowships in the Sciences & Engineering were established in 2002 by the children of Mary Jane Brokaw Swanson '52 and Jack Swanson '51 to honor their parents. The fellowships have been increased regularly with gifts from the Swansons and members of their family. Swanson Fellowships are granted to newly hired faculty in the laboratory science and engineering departments to support their research and professional academic development.

The John P. & Mary Jane Swanson Professorship in Engineering & the Sciences was created by gifts from Mary Jane Swanson, Class of 1952, and her family. Faculty appointed to this professorship will engage students through instruction, collaborative research and scholarship in engineering or the natural sciences.

The David Morton & Leanne Freas Trout Professorship of French was established in 2008 by Leanne Freas Trout, Class of 1950, to honor the memory of her late husband, David, also a member of the Class of 1950, and an Emeritus member of the University's Board of Trustees. Those selected to hold this professorship will be appointed for five-year terms and charged to lead students through teaching, personal and directed student scholarship and collaboration with faculty peers and students in the study of French language and culture and Francophone studies.

The Charles P. Vaughan Chair in Economics was created by the Bucknell University Board of Trustees in the mid-1920s in recognition of Charles P. Vaughan's sustained support of the University during times of extreme financial duress. The chair honors Charles P. Vaughan by promoting a faculty of superior teachers who maintain a high level of scholarship.

The David J. '85 & Deborah West Professorship in Management was created by gifts from David J. West, Class of 1985, and Deborah West. Income from the fund supports teaching and research in management. In particular, the West Professorship is meant to support faculty members with a demonstrated commitment to building connections between management and the liberal arts.

The Ellen P. & Samuel L. Williams Endowed Music Professorship Fund was created in 2009 through a bequest gift from Ellen Peterson Williams, Class of 1919, to honor the time she spent at Bucknell and the memory of her husband, Samuel L. Williams. The fund creates two professorships: the Ellen P. Williams Professorship awarded to a senior faculty member in music, and the Samuel L. Williams Professorship awarded to a junior faculty member in music.

Endowed Scholarships

Note: Many Bucknell endowed scholarships are awarded to qualified individuals on the basis of documented financial need as determined by the Office of Financial Aid. Awards from these funds shall be made in compliance with the University policy of nondiscrimination.

The 100 Years of Women in Engineering Scholarship Fund was created by gifts from members of the Bucknell Engineering Alumni Association and other donors to recognize the milestone of 100 years since the first woman earned an engineering degree at Bucknell. Katherine Owens Hayden, Class of 1923, earned a degree in chemical engineering and opened the door for future generations of women majoring in engineering. The fund shall be awarded to students enrolled in the College of Engineering. Preference shall be given to women studying in the college.

The Dr. Robert T. Abraham '74 and Diane Otterness Family Scholarship was created by a gift from Robert Abraham, Class of 1974, and his wife, Diane Otterness. Grants shall be made to students based on financial need, with preference given to students in the College of Arts & Sciences.

The Accenture Scholarship was established in 1996 by Accenture, a global leader in management and technology consulting. The award was created in recognition of the number of Bucknell University graduates enjoying successful careers at Accenture, and to demonstrate Accenture's ongoing support of the Bucknell student community. Preference for the scholarship shall be given to upper-class students (sophomores, juniors or seniors) who have maintained a solid GPA while demonstrating active participation and leadership in campus activities.

The William D. Adams Presidential Scholarship was established in 2000 by Judy Plattman Denenberg, Class of 1957, and Byron A. Denenberg, Class of 1956, in honor of William "Bro" Adams, who served as Bucknell's 14th president from March 1995 to June 2000. The scholarship shall be awarded to students with demonstrated financial need, with preference for students whose ethnic, racial, economic or national origins add to the diversity of Bucknell.

The Guy A. Agati Memorial Scholarship was established by Norma Z. Agati to honor the memory of her husband. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Steven Ahmuty Scholarship was established in 2005 by Steven J. Ahmuty Jr., Class of 1975. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Tyler H. Ahmuty Scholarship was established in 2009 by Tyler H. Ahmuty, Class of 2009. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The George I. Alden Trust Scholarship was established through a distribution from the George I. Alden Trust. The scholarship shall be awarded to students with demonstrated financial need and gives preference to students who reside in Massachusetts or other New England states.

The Dr. Alexander Aleshouckas Allen, Class of 1922, & Joseph Aleshouckas Allen, Class of 1915, Scholarship for students of chemistry and chemical engineering was established by Patricia Allen Dreyfus, Doc's daughter and Joe's niece. Preference for the scholarship award shall be given to residents of Luzerne, Schuylkill or Berks counties, Pa.

The Ezra Allen Scholarship was established by Ezra Allen, Class of 1895, to be awarded to a student who meets high academic standards, a preference to be shown for a student majoring in biology.

The Vivian B. Allen Foundation Scholarship Fund was created in 1969 to provide scholarship aid for students from foreign countries.

The Michael N. Allwin '12 Scholarship was funded by a gift from Maria Allwin in honor of her son, Michael Allwin, Class of 2012. Awards shall be made to students based on financial need, without restriction.

The AlsopHurd Family Scholarship was created with gifts from Jim Alsop and Marlene Hurd, both Class of 1979, and Justin Alsop, Class of 2010, in memory of their parents and grandparents, James and Etta Alsop and Mona (Hurd) Style. Three generations of Alsop and Hurd families share a vision of a more diverse Bucknell and champion efforts to support underrepresented students demonstrating financial need. Grants shall be made to students based on financial need, with preference given to graduates of the Baltimore Polytechnic Institute in an ongoing effort to create an inclusive and nationally representative Bucknell community.

The American Baptist Men of Pennsylvania & Delaware Scholarship was established to assist needy and deserving students, with preference given to American Baptists.

The David James Ambuhl '80 Memorial Scholarship was established by his family and friends. The scholarship shall be awarded to students with the most pressing financial need, with preference for students enrolled in the College of Arts & Sciences and without other restriction.

The Ted Ammon Scholarship was established by R. Theodore Ammon, Class of 1971. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Owen & Judith Anderson Scholarship was established in 2007 by Owen Anderson, professor emeritus of physics and astronomy, and his wife, Judith Anderson, in appreciation for the benefits made available by the University for the education of their five children. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Robert S. Anderson Scholarship was established by Dr. Anderson, Class of 1933, to support pre-medical students from northeastern Pennsylvania. Residents of Luzerne County will receive first consideration, followed by residents of Lackawanna and Wyoming counties.

The Michael Andrews '64 Scholarship was established in 2000 by friends and classmates of Mike Andrews, Class of 1964. The scholarship shall be awarded to students with demonstrated financial need, with preference for students enrolled in biomedical engineering courses.

The Arvilla J. Arnold Scholarship was established by Arvilla J. Arnold. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who are on the varsity track or cross-country teams and without other restriction.

The Association for the Arts Scholarship was established by the association in 1988. The scholarship is awarded at the discretion of the executive committee of the association to provide financial assistance to deserving undergraduate students, with preference given to students who display special talents in one or more of the arts, such as but not limited to art, creative writing, dance, music and theatre.

The Athletic Scholarship was established anonymously by a member of the Class of 1980. Preference for awards from this scholarship shall be given to talented scholar-athletes with demonstrated financial need.

The Voris Auten Scholarship Fund was established by a bequest from Joseph W. Deppen, Class of 1900. The income is to be used for scholarships for those who have resided in Mount Carmel for 10 years, who are graduates of Mount Carmel Public High School, who are not habitual users of tobacco, intoxicating liquor and narcotics, and who do not participate in strenuous athletic contests.

The Warren Baas Scholarship, established by the family and friends of Warren Baas, Class of 1973, is to be awarded to a member of the senior class, with preference given to an engineering major who has combined academic strength and significant extracurricular contributions to the University.

The Baird Family Scholarship was established by Charles F. and Norma W. Baird, Class of 1946. Preference for the scholarship award shall be given to worthy and needy students and without any restriction.

The George Ballentine Scholarship was established by The Rev. George Ballentine, A.M., Class of 1871, for a pre-ministerial student.

The Herbert Barness Scholarship was established by gifts from family and friends in honor of Herbert Barness, Class of 1948. The income is to be used annually to provide financial aid to a deserving undergraduate selected by the University.

The Olive B. Barr Scholarship Fund was established in 2008 with a testamentary gift from Olive Barr, Class of 1931. Olive realized the importance of providing an educational opportunity for students. Awards shall be made to students with demonstrated financial need in the liberal arts curriculum.

The Kirk Richard Barrett Memorial Scholarship was established March 8, 1997, by the family and friends of Kirk Barrett, Class of 1987, in his memory after a tragic and untimely death in 1994. It includes a gift from his estate in honor of his love for Bucknell, and his respect for Professors Warren Abrahamson and Michael Moohr. The income is to be awarded annually to a junior or senior student with financial need, with preference given to a major in biology, economics or business, who has been supportive of the best interests of Bucknell University and who has demonstrated positive interpersonal skills and leadership.

The Charles S. Baton Scholarship was established in memory of Charles S. "Charlie" Baton, Class of 1983, by his family: his parents, Janet M. and G. Scott Baton; his sister, Elizabeth M. Baton; his wife, Cheryl A. Lesser, Class of 1985; and his daughter, Emily L. Baton. It is to be awarded to worthy and needy students without restriction.

The Louis M. & Elsie Battenfeld Scholarship was established in 1975 by Louis M. Battenfeld, the income to be used to provide financial aid for worthy undergraduate or graduate students selected by the University.

The Charles T. Bauer Scholarship was established in 2006 by the Charles T. Bauer Foundation. This scholarship will be awarded to a student who lives in the Baltimore City School System and who exhibits significant financial need. The Charles T. Bauer Scholarship honors the memory of Charles T. “Ted” Bauer, a man of modest upbringing and altruistic spirit, who wanted the future to be better than the past. Mr. Bauer recognized his place in the universe and he used his life to give generously to others.

The Matthew C. Baumeister Memorial Scholarship was established in 2006 by Lynn and Michel Baumeister in memory of their son, Matthew Charles Baumeister, Class of 2008. Preference for the scholarship award shall be given to students who have overcome significant personal obstacles to attend Bucknell.

The Bright W. Beck Scholarship was established by a bequest of Bright W. Beck, Class of 1913, the income of which is to be used to provide financial assistance to students.

The William H. Beck Scholarship was established by Aida M. Houston in memory of her uncle, Class of 1862, the income to be used for students of the Christian faith who are in need of financial assistance.

The Dawn M. Becker Scholarship was created by gifts from Trustee Dawn Becker, Class of 1985. Grants shall be made to students based on financial need and without further restriction.

The Beidler Family Memorial Scholarship was established in 2011 by J. Garry Beidler, Class of 1958, as an expression of his family’s abiding love for an institution that guided and shaped their lives, and for all the principles and ideals that Bucknell continues to represent. The scholarship shall be awarded to students with demonstrated financial need, with preference to students who are residents of Adams, Bucks, Franklin or Fulton counties, Pa. The scholarship was established to commemorate the Beidler Family’s legacy at Bucknell. Members of the family include: Bruce B. Sheats, Class of 1937; Harvey P. Pettit, Class of 1942; Mary Beidler Pettit, Class of 1943; J. Kay Sheats Beidler, Class of 1959; Andrew W. Beidler, Class of 1985; Kimberly Knouse Beidler, Class of 1985; and Christopher B. Beidler, Class of 1989.

The Edward Bell Family Memorial Scholarship was established by Martin Bell Christy Jr., Class of 1931, and other descendants of Edward Bell. Bell family members were included among Bucknell’s first trustees, students and administrators; more than 100 descendants have attended Bucknell. This scholarship was established to commemorate those long family ties. Preference for the scholarship will be given to Pennsylvania residents.

The John A. Bell Memorial Scholarship was established by his wife, Amy Bell, and by the gifts of friends to honor his memory. Preference for the scholarship award will be given to qualified and needy students majoring in mechanical engineering.

The Rowland E. Bell Dean’s Scholarship was established in 2008 by Rowland E. Bell, member of the Class of 1959. The scholarship will be used to recruit academically superior students in the College of Engineering.

The Rowland E. Bell Family Scholarship was established by Rowland E. Bell, Class of 1959. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Eleanor H. Bendell Scholarship was funded by a gift from the estate of Eleanor Holmes Bendell, Class of 1941. Awards shall be made to students based on financial need, with preference given to students majoring in education.

The Jean Nardi Benning Scholarship was established by Jean Nardi Benning, Class of 1959, and her husband, William A. Benning. The scholarship shall be awarded to students with demonstrated financial need, with preference given to students who have also demonstrated exceptional scholarship and leadership and significant service to the Bucknell Catholic Community.

The Paul Benson Memorial Scholarship was established by William Mendenhall III to honor the memory of his former teacher and colleague. Preference for the scholarship award will be given to students interested in applied mathematics who reside in Lycoming or other central Pennsylvania counties.

The Houston Bentzen Family Scholarship was created by a gift from Richard D. Bentzen, Class of 1975, and Anne Houston Bentzen, Class of 1976. Grants shall be made to students in the College of Engineering based on financial need.

The Caroline V.S. Bergen Scholarship was established by her son, John L. Bergen, Class of 1935. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who intend to pursue careers in medicine or who have demonstrated a significant commitment to be of service to others.

The Berlin Family Scholarship was established by George R. Berlin, Class of 1965; his mother, Elizabeth Smith Berlin, Class of 1935; and his sons, Bradley J. Berlin, Class of 1993, and William B. Berlin, Class of 1993 (M.A.), in recognition of George R. Berlin's father, William H. Berlin, Class of 1935. Preference for the scholarship award shall be given to students whose racial, ethnic, cultural, economic or other characteristics enhance the diversity of Bucknell's student group.

The Ellen Clarke Bertrand Scholarships were established by a bequest from Ellen Clarke Bertrand, a former trustee, in memory of her husband, Herbert Bertrand, and her parents, Samuel J. and Agnes Robertson Clarke, the income of which will be used as scholarships for young women and men of ability and good character who need financial assistance.

The Beshel Family Scholarship was established by Joseph J. Beshel. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Beth Eden Baptist Church Scholarship was established by the Beth Eden Baptist Church of Pittsburgh for a pre-ministerial student who needs help.

The Howard D. Bidwell Scholarship was established in 2000 by Howard D. Bidwell, Class of 1952. The scholarship shall be awarded to students with demonstrated financial need, with first preference for students majoring in the civil engineering program and secondary preference for students majoring in other engineering programs.

The Bilanin Family Engineering Scholarship was created by gifts from the Bilanin Family. Grants shall be made to students in the College of Engineering based on financial need, and only to students from underrepresented groups whose matriculation in the College of Engineering at Bucknell will further the University's diversity goals.

The Billings Family Scholarship was established in 2004 by Ronald P. '69 and Ruth Ralph '69 Billings. Grants shall be made to students based on financial need, with preference for students enrolled in the College of Engineering or who are majoring in education.

The Bison Battalion Scholarship was created by gifts from Adam Coyle, Class of 1987, and Stacy Coyle, in honor of the many men and women who have been commissioned as military officers through Bucknell's ROTC program. Grants shall be made to students based on financial need and without further restriction.

The Harriet Smull Blesh Fund was established by Harriet Smull Blesh, Class of 1928, and her husband, Morrell H. Blesh, in honor of their son, James Smull Blesh. Income from this fund shall be used each year to provide scholarship aid, modification of physical facilities, special aid and assistance, or whatever is deemed most necessary by the University to make education possible for qualified students with physical handicaps.

The Lawrence S. Bloom Scholarship was established by Mr. Bloom, Class of 1952, to support qualified students with demonstrated financial need. First preference for the award will be given to student residents of Blair County, Pa.

The Mitchell E. Blumenfeld '91 Scholarship was created by gifts from Mitchell E. Blumenfeld, Class of 1991. Grants shall be made to students in the College of Engineering based on financial need and without further restriction.

The Bohling-Snyder Scholarship was established by Dorothea Bohling Snyder, Class of 1952, to honor her time at Bucknell and the memory of her husband, Paul, and their parents. The scholarship shall be awarded to students with demonstrated financial need, with preference given to students majoring in mathematics, engineering or the sciences.

The Elmer K. Bolton Scholarship was established by a gift from Elmer K. Bolton, Class of 1908.

The Boston-Lyon Family Scholarship was established in 1999 by Lois Depuy Boston, Class of 1945, and her husband, E. Daniel Boston. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Roy Grier Bostwick Scholarship Fund was established by action of the Board of Trustees out of the residuary bequests in the estate of Marie Leiser Bostwick, Class of 1899. It honors her husband, Class of 1905, who was a Board of Trustees member, 1919-1947, and chairman, 1941-1947.

The Joseph J. Bosze '39, GP'94 Scholarship was created by a gift from Scott Chesky '94, Rick Chesky, and Pamela Chesky P '94 in memory of Pamela's father. Grants shall be made to students based on financial need, with preference given to students in the Freeman College of Management.

The Bott-Jennings Family Scholarship was established by Robert L. Jennings Jr., Class of 1973, and Barbara H. Bott, Class of 1973. The scholarship shall be awarded to students with demonstrated financial need, whose ethnic, racial, economic or national origins add to the diversity of Bucknell.

The Amy Bourdeau '95 Scholarship was created by gifts from Laura and Daniel Bourdeau in loving memory of their daughter, Amy Bourdeau, who graduated in the Class of 1995 with a B.S. in civil engineering. Grants shall be made to students based on financial need, with preference for students majoring in civil engineering, with additional preference for female students.

The Richard W. Bowen Class of 1944 Scholarship was established by Richard W. Bowen, Class of 1944. Preference for the scholarship award shall be given to students enrolled in the College of Engineering and holding superior academic credentials.

The James Roland Brady Scholarship was established by James E. Soller, Class of 1969, and Janet Clark Soller, Class of 1968, in memory of James' maternal grandfather. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Arthur L. Brandon Athletic Scholarship was created by a bequest from Arthur L. Brandon, Class of 1927. Awards made from the scholarship shall be granted to talented student-athletes with demonstrated financial need, especially those who have been selected by the coaches in consultation with the director of athletics and the director of financial aid, as most likely, without a grant from this fund, to attend some other college. Awards from the fund shall be made without other restriction.

The Braniff Family Scholarship was created by gifts from John Braniff, Class of 1986, and Rosemary Braniff, dedicated parents of John Kevin Braniff II. Grants shall be made to students based on financial need and without further restriction.

The Arthur L. & Margaret Weddell Brandon Scholarship was established by trustee emeritus Arthur L. Brandon, M.S. 1927, in loving memory of his wife, Margaret, Class of 1916. The scholarship is given preferentially as a grant to reduce the self-help obligation of student-athletes at Bucknell.

The Brandon Family Scholarship was established by Virginia Brandon Davis, Class of 1936, in honor of the Brandon family members who attended Bucknell. The scholarship is given preferentially as a grant to reduce the self-help obligation of student-athletes at Bucknell and serves as a companion to the Arthur L. & Margaret Weddell Brandon Scholarship.

The Bravman-Wright Family Scholarship was created with gifts from current and emeritus members of the Bucknell Board of Trustees to honor President John C. Bravman and Professor Wendelin Wright on their 10th anniversary of service to the University. The scholarship recognizes John and Wendy's deep commitment to education and their leadership and dedication to the entire Bucknell community. Grants shall be made to students based on financial need.

The Lauren P. Breakiron Engineering Scholarship was funded by a gift from the estate of Trustee Lauren P. Breakiron '52. Awards shall be made based on academic merit and without regard to financial need to students enrolled in the College of Engineering who are United States citizens.

The Lauren P. Breakiron Scholarship was established by Lauren Breakiron, Class of 1952. Preference for the scholarship award will be given to students who are citizens of the United States majoring in engineering or computer science.

The Margaret Meston Breg Scholarship was established in 2007 by Margaret M. Breg, Class of 1944. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who are residents of Connecticut and without other restriction.

The John J. Brighton Scholarship was created by gifts from Scott Brighton, Class of 1989, and Coleen Brighton, parents of Cameron Brighton, Class of 2023, to honor the memory of Scott's father, John, who afforded him the life-changing opportunity to attend Bucknell. Grants shall be made to students in the College of Engineering based on financial need.

The Virginia C. Bristol Scholarship was established through a bequest by Virginia C. Bristol, Class of 1931. The scholarship shall be awarded to students with demonstrated financial need, with preference to students majoring in mathematics and without further restriction.

The Maureen Maguire & Suzanne Hunt Brott Memorial Scholarship was established in 2011 by Raymond Sullivan, Class of 1986, and his wife, Megan Brott Sullivan, Class of 1986, as a memorial to their mothers and to honor their commitment to quality education. The scholarship is intended to continue that support and shall be awarded with preference given to students enrolled in the College of Arts & Sciences with demonstrated financial need.

The Brough-Webber Memorial Scholarship was established in 2004 by Elizabeth Brough Webber and William R. Webber, Class of 1950. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in music, business or economics.

The Eleanor Golightly McChesney '46 & Joann Golightly Brown '48 Scholarship was established by the McChesney and Brown families in honor of Eleanor Golightly McChesney, Class of 1946, and Joann Golightly Brown, Class of 1948. Preference for the scholarship award will be given to a student who pursues or plans to pursue a major in any branch of the physical or biological sciences.

The Owen Brown Memorial Scholarship was established in 2005 by Hollis and Gail Brown, both members of the Class of 1969, to honor the memory of their grandson. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in biology, cell biology/biochemistry, chemistry or any engineering discipline. Further preference shall be given to students who intend to pursue research in their chosen field of study.

The Wayne Marshall Brown Memorial Scholarship was established by Harriet C. Brown, J. Marshall Brown and friends in memory of Wayne Marshall Brown, Class of 1973. Preference for the scholarship award shall be given to a qualified student majoring in art.

The P. Dewees Browning Scholarship was established by a bequest of Daisy Bell Browning in memory of her husband, Class of 1904, the income to be used as a scholarship for a deserving student.

The Brumbaugh Family Scholarship was funded by a gift from David S. Brumbaugh '84. Awards shall be made to students based on financial need, without restriction.

The Robert J. Brungraber G'05 Memorial Scholarship was established in 2022 to preserve and honor the memory of Professor Robert "Bob" Brungraber. Bob left an indelible impression on the lives of those who had the privilege of knowing him, and this scholarship shall stand as a tribute to his legacy as an educator, scholar, father, mentor and friend. Grants shall be made to students based on financial need who are enrolled in the College of Engineering, with preference given to students majoring in civil engineering.

The Bucknell Alumni Association Scholarship was established in 1985 by the board of directors of the Alumni Association of Bucknell University. Preference for awards from the fund will be given to students who meet the requirements for financial aid and who are the children of Bucknell alumni.

The Bucknell on the Camino de Santiago Scholarship was created by a gift from Ann Loar Brooks, Class of 1975, and Steven G. Brooks. Grants shall be made to students based on financial need who are enrolled in the Bucknell on the Camino de Santiago program.

The Harriet M. Bucknell Scholarship was established by Mrs. Harry S. Hopper in memory of her mother. The scholarship is to be awarded to a young woman.

The William Bucknell Scholarships are given to help worthy young men to obtain an education with which to increase their usefulness in life.

The Bernita Earl Budenbender Scholarship was established by Brenda M. Earl, Class of 1981. Preference for the scholarship award shall be given to students who are judged to have the most pressing financial need and who are enrolled in the College of Arts & Sciences, and without other restriction.

The Marie & Fred A. Bufanio Sr. Scholarship was established by Fred A. Bufanio Sr., Class of 1936, and his wife, Marie. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in chemical engineering and without other restriction.

The Clyde E. Burgee Memorial Scholarship Fund was established by Samuel H. Woolley, Class of 1932, and other former students and friends of Professor Burgee, the income to be used to aid needy students majoring in accounting and economics.

The Colonel George Robert & Emma Louise Burman Scholarship was created by a gift from George R. Burman Jr., Class of 1973. Grants shall be made to students in the College of Engineering based on financial need.

The Amy (Mears) '96 & Grady Burnett Family Scholarship was funded by a gift from Amy Burnett, Class of 1996, and her husband, Grady. Grants shall be made to students based on financial need and without further restriction.

The Joseph Hamilton Burnett Scholarship was established by a bequest of Helen Couffer Bonsall, the income to be used as a scholarship for deserving students.

The Alma Jacobs Burt Scholarship was established by Rachel Carringer Hauth, Class of 1941. The scholarship award shall be made without restriction.

The John C. Bush Memorial Scholarship was established by Ellen Q. Bush, Class of 1979, in memory of her father, John C. Bush, Class of 1942. Preference for the scholarship award shall be given to students from northeast Pennsylvania, and to those students whose enrollment supports the University's vision for diversity.

The William J. Busser Jr. & Alvesta R. Busser Memorial Fund was established by a bequest of William J. Busser Jr., the income to be used for scholarships for needy and worthy graduates of the Lewisburg Area High School, who are nominated by the Lewisburg Area School Board, and who could not otherwise afford a college education.

The Arthur F. Butcosk Scholarship was established by a bequest plan from Arthur F. Butcosk, Class of 1937. The scholarship shall be awarded to students with demonstrated financial need, with preference given to students majoring in the sciences, and special preference given to chemistry majors.

The Edna Follmer Butt Memorial Scholarship was established by an estate gift from Grace R. Follmer, Class of 1921, and Helen Follmer Lutz, Class of 1921, in memory of their sister, Edna Follmer Butt, Class of 1922, who was a teacher of mathematics. Preference for the scholarship award shall be given to students majoring in mathematics.

The Robb '86 & Joan Cadigan '86 Family Scholarship was established in 2004 by Robb '86 and Joan D. Cadigan '86. The scholarship shall be awarded to students with demonstrated financial need who are majoring in the liberal arts.

The Joseph J. Calaman and John T. Calaman Scholarship was established by Joseph J. Calaman, Class of 1943, and is named for him and his brother, John T. Calaman, Class of 1950. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who are United States citizens majoring in the arts, business, sciences or engineering.

The John V. Campana III Scholarship was established in his memory by IDS Financial Services Inc. and enhanced by family and friends. The income will provide financial aid for a deserving undergraduate athlete selected by the University in accordance with established scholarship policies. Preference shall be given to a junior or a senior athlete who is majoring in management, accounting or economics, and who is interested in the financial services profession.

The Robert B. & Ellen H. Campbell Scholarship was established by Robert B. Campbell, Class of 1950, and Ellen H. Campbell, Class of 1950. Preference for the scholarship award shall be given to management majors who are entering their junior year and who have displayed academic excellence. In gratitude for the education the donors received as a result of the GI Bill, the donors also desire that the award be given to students who are United States citizens.

The Douglas K. Candland Scholarship was established by Glen E. Tullman, Class of 1981, and his wife, Trish, to honor Professor Candland's years of service as teacher, scholar and mentor. The scholarship shall be awarded to students with demonstrated financial need who are majoring in the liberal arts.

The Carll Family Scholarship was funded by a gift from James H. "Jim" Carll, Class of 1971, and Mary E. "Beth" Carll, parents of Jamie Lynn Carll, Class of 2008. Awards shall be made to students based on financial need, without restriction.

The Thomas G. Carodiskey Scholarship was established by Thomas G. Carodiskey, Class of 1949, in memory of Dr. Roy C. Tasker, professor of biology, and Dr. Mildred A. Martin, professor of English. The scholarship shall be awarded to students with demonstrated financial need, with preference for students of the arts and humanities and without other restriction.

The F. W. "Bill" Carson '42 & Betty Thomas Carson '42 Scholarship was established in 2000 by Bill Carson '42 and Betty Carson '42. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in English who have demonstrated interest in creative writing.

The Harry L. & Marjorie R. Carson Scholarship was established in 2000 by Harry L. Carson, Class of 1939, to celebrate his long association with Bucknell and to honor the memory of his wife, Marjorie. Awards are to be made to students with financial need, with preference given to students majoring in management or accounting.

The Dora O'Brien & Margaret O'Brien Case Scholarship Fund was established by the estate of James A. Case, Class of 1917. Awards from the fund are to provide scholarships to needy women graduates of Lewisburg area high schools who are attending Bucknell University.

The James B. Cawley Scholarship was established by Florence T. Cawley in memory of her husband, Class of 1887, for the support of a worthy student from Northumberland County.

The William A. Cawley Memorial Scholarship was established by Alice Spokes Cawley, Class of 1929, in memory of her husband, a member of the Class of 1915. The scholarship award will be made without restriction.

The John I. Chamberlain Scholarship was established by a bequest from the estate of his mother, Elizabeth I. Chamberlain, to preserve and honor the memory of John I. Chamberlain, Class of 1966. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who are members of the editorial staff of *The Bucknellian*.

The Champlin Family Scholarship was established in 2007 by Ellen Campbell Champlin, B.S. 1958, M.S. 1960, and her husband, Clarence Champlin, in deep gratitude for the preparation received by Ellen for a career in elementary education. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

The Chandler Family Scholarship was established in 2006 by Sally T. Chandler; her daughters, Nancy Chandler Koglmeier '78 and Elizabeth Chandler Bell '86; and her daughter-in-law, Elizabeth Cosgrove Chandler '82. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who have transferred to Bucknell from community or junior colleges.

The Liz Cosgrove Chandler '82 & David Chandler Scholarship was established in 2008 by Liz Cosgrove Chandler and David Chandler. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

The William R. Chaney Family Scholarship was established in 2006 by Carole Chaney Prosser '81, Diana Chaney Price '84, and William R. Chaney, parent. This scholarship is in recognition of Carole and Diana's appreciation for their father's unwavering support, guidance and belief in the opportunities made possible through education. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

Xin Liang & Xiu Chun (Wong) Chang Scholarship was created in honor of the grandparents of Stephen Chang, Class of 1967, and Margaret Cheung, Class of 1974, and great-grandparents of Stephanie Chang, Class of 2006. Grants shall be made to students based on financial need, with preference for students majoring in science, math or engineering.

The Edith Griffiths Chisholm Scholarship was established through a bequest from Edith "Peggy" Griffiths Chisholm, Class of 1945. The scholarship shall be awarded to students with demonstrated financial need, with preference for students from Dutchess County, N.Y., and without other restriction.

The Robert & Ellen Chrencik Scholarship was established in 2007 by Robert Chrencik, Class of 1973, and his wife, Ellen Chrencik. The scholarship shall be awarded to students with demonstrated financial need, with preference for students in the management department majoring in management or accounting.

The Thomas S. Christo Jr., Class of 1965, Memorial Scholarship was established by his parents, to be awarded preferably to a worthy member of the Alpha Phi chapter of the Kappa Sigma fraternity.

The G. Thomas Clark Scholarship was established in 1994 by G. Thomas Clark, Class of 1959. The scholarship shall be awarded to students who are judged to have the most pressing demonstrated financial need, with preference given to those from the Rochester, N.Y., metropolitan area.

The Class of 1907 Scholarship Fund was established by a contribution from Mary Stanton Speicher and John W. Speicher, her husband. Additional funds were provided by Margaret E. Catherman in memory of her husband, John I. Catherman. The income is to be given to a worthy and needy student.

The Class of 1929 Scholarship is awarded each year to a deserving student.

The Class of 1932 Scholarship was established at the 50th Reunion of the class through gifts by class members. There are no restrictions on the scholarship, which is to be awarded by the Office of Financial Aid in accordance with standard University policy.

The Class of 1934 Scholarship, established at the 50th Reunion of the class through gifts by class members, is awarded annually to a deserving student.

The Class of 1936 Scholarship was established by members of the class during their 50th Reunion year. The scholarship is unrestricted.

The Class of 1937 Scholarship was established by members of the class in 1987 to commemorate their 50th Reunion. The scholarship is unrestricted.

The Class of 1938 Scholarship was established by members of the class in 1988 to commemorate their 50th Reunion. The scholarship is unrestricted.

The Class of 1939 Scholarship was established by members of the class in 1989 to commemorate their 50th Reunion. The scholarship award will be made without restriction.

The Class of 1940 Scholarship was established in 1990 by members of the class and presented to the University in memory of former Bucknell president Arnaud C. Marts to commemorate their 50th Reunion. The scholarship award will be made without restriction.

The Class of 1941 Scholarship was established in 1991 by members of the class to commemorate their 50th Reunion. This scholarship was presented to the University in honor of all Bucknellians who served in World War II, especially those who gave their lives. The scholarship award shall be made without restriction.

The Class of 1942 Scholarship was established in 1992 by members of the class to commemorate their 50th Reunion. The scholarship award shall be made to a deserving undergraduate student and without other restriction.

The Class of 1943 Scholarship was established in 1993 by members of the class to commemorate their 50th Reunion. The scholarship award shall be made to deserving undergraduate students with demonstrated financial need and without other restriction.

The Class of 1944 Scholarship was established in 1994 by members of the class to commemorate their 50th Reunion. The scholarship award shall be made to deserving undergraduate students with demonstrated financial need and without other restriction.

The Class of 1945 Scholarship was established in 1995 by members of the class to commemorate their 50th Reunion. The scholarship award shall be made to deserving undergraduate students with demonstrated financial need and without other restriction.

The Class of 1946 Scholarship was established by members of the class during their 40th Reunion year. The scholarship is unrestricted.

The Class of 1957 Scholarship was established in 2007 by the Class of 1957 to commemorate their 50th Reunion. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

The Class of 1968 Scholarship was established by the class at its 10th Reunion as part of Bucknell's first Senior Class Reunion Gift Program. It is to be awarded each year to a deserving student.

The Class of 1970 Scholarship was established by members of the Class of 1970 in celebration of their 25th Reunion and in honor of Gary A. Sojka on the occasion of his retirement as 13th president of Bucknell University. The scholarship commemorates Dr. Sojka's many contributions during his tenure at Bucknell. Consistent with his commitment to the founding principles and cherished traditions of the University, and his all-inclusive interest in and dedication to all Bucknell students, awards from this fund shall be made to students with demonstrated financial need and without restriction.

The Class of 1985 Scholarship was established in 1995 by members of the class to commemorate their 10th Reunion. The scholarship award shall be made to deserving undergraduate students with demonstrated financial need and without other restriction.

The Class of 1986 Scholarship was established in 1996 by members of the class to commemorate their 10th Reunion. The scholarship award shall be made to deserving undergraduate students with demonstrated financial need and without other restriction.

The Class of 2020 Scholarship was created by gifts from the Hetherington Family. Grants shall be made to students based on financial need.

The Kenneth R. Cole '59 Memorial Scholarship was created by gifts from Ken's wife, Marilyn S. Cole P'88, and their daughter and son-in-law, Corinne C. Ryan and Robert M. Ryan Jr., both Class of 1988. Grants shall be made to students based on financial need and without further restriction.

The R. Henry Coleman Memorial Scholarship was established by friends and family members of Mr. Coleman, a Bucknell trustee from 1955-1976, and chairman of the board from 1972-1976. The Coleman Scholarship will be awarded annually to Bucknell students with demonstrated need and high academic promise.

The Colvin-Greene Memorial Scholarship was established in memory of Irene Colvin Kunschner, Class of 1927, and in honor of her parents, Eva Greene and Abram Colvin, by their family, friends and neighbors. Preference for the award will be given to students of musical accompaniment and the humanities, with special preference to residents of Susquehanna County, Pa.

The Clarence B. & Samuel G. Comstock Scholarship was established through a bequest by Rachel M. Comstock. The scholarship fund is for students in the junior class who have excelled in the study of biology, and who seem likely to become outstanding medical practitioners.

The Claire M. Conway Scholarship was established by Claire M. Conway, Class of 1905.

The John R. Conway Scholarship was established by Patricia M. Watts in memory of her brother-in-law. Preference for the scholarship award shall be given to students who intend to pursue a career in business.

The Conway Family Scholarship was established by Larry and Carolyn Wilcox (Class of 1962) Conway. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Cook Scholarship was established by Thomas N. Cook Jr., Class of 1978. Preference for the scholarship award will be given to students demonstrating excellence and leadership in academics, athletics and fraternal activities.

The Eugene & Doris Cook Scholarship was established in 2002 by M. Eugene Cook, Class of 1943. The scholarship shall be awarded to students with demonstrated financial need studying engineering, computer science, physics, chemistry or pre-medical studies, and who reside in Union, Snyder, Centre, Clinton, Lycoming, Northumberland, Columbia or Montour counties, Pa.

The Franklin H. & Ann Graybill Cook Scholarship was established by gifts from Franklin H. and Ann Graybill Cook, both members of the Class of 1933. Preference for the scholarship award shall be given to students majoring in sociology or political science.

The Shirley J. Cook Scholarship was funded by a gift from the estate of Shirley J. Cook, Class of 1974. Awards shall be made to students based on financial need and without restriction.

The William Albion Cook Scholarship was established by Mrs. Augusta N. Cook in memory of her son, Class of 1899, for a male student.

The Mr. & Mrs. Robert L. Cooley Scholarship was established by Robert L. Cooley, Class of 1936, and his wife, Norma. The scholarship shall be awarded to students with demonstrated financial need who have excelled academically.

The John R. & Virginia R. Cooper Scholarship was established by a testamentary gift from Mr. Cooper, a friend to Bucknell, and father and grandfather of Bucknellians. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Richard & Janet Costa Advancement of Science Scholarship was established in 2011 by Michael J. Costa, Class of 1991, and his wife, Laureen R. Costa, Class of 1990, with funding from The Houston Endowment, to honor their parents' example of encouraging the study and practice of science and engineering. The scholarship shall be awarded with preference for finalists, semi-finalists, or students competing in the national Intel Science Talent Search.

The Reverend Emily W. Craig Scholarship was established through a bequest from Emily W. Craig, Class of 1944. Preference for the scholarship award shall be given to a student studying religion or English.

The Ernest S. Cramer Scholarship was established by Ernest S. Cramer, Class of 1938. Preference for the scholarship award shall be given to students with demonstrated financial need majoring in engineering or the sciences.

The Anna May Speare Crist Scholarship was established by Charles W. Crist in memory of his wife, Class of 1923, the income to be used for an outstanding student majoring in French.

The CTW-Beneficial Foundation Scholarship Fund was established in 1973 by the Beneficial Foundation Inc. In 1998, the foundation changed its name to CTW Foundation Inc. The income is to be used to establish scholarships for needy and disadvantaged students.

The H.E. Culver Scholarship for Science & Engineering was established by H.E. “Ed” Culver, B.S. Class of 1950, M.S. Class of 1951. Preference for the scholarship award shall be given to students enrolled in the five-year program in liberal arts and engineering, who combine engineering with physics or chemistry, and to students majoring in physics or chemistry.

The Martin & Arlene Cummings Scholarship was established with gifts from Martin M. ’41 and Arlene Avrutine Cummings ’42. Awards shall be made to students based on financial need, with preference given to pre-med students or students majoring in the biomedical sciences.

The Jane W. Curtis & Susan J. Curtis Scholarship was established by Jane Wherly Curtis, Class of 1957, and her daughter, Susan J. Curtis, Class of 1989. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in French.

The Cusick Scholarship was established by William J. and Joyce D. Cusick, parents of William J. Cusick, Class of 1981; George R. Cusick, Class of 1983; Susan Sisto Cusick, Class of 1983; and Thomas E. Cusick, Class of 1987. The scholarship shall be awarded to University students with demonstrated financial need, with preference given first to descendants of William J. and Joyce D. Cusick, then to members of a men’s varsity lacrosse team who are citizens of the United States.

The D'Agnes Family Scholarship was created by gifts from Christopher M. D'Agnes, Class of 1999, and Jennifer Quinzi D'Agnes. Grants shall be made to students based on financial need, without further restriction.

The Daley Family Scholarship was created by gifts from Meredythe (Gray) Daley, Class of 1974, and her husband, Clayton Daley Jr. Grants shall be made to students based on financial need, with preference given to first-generation college students or community college scholars.

The George H. & Kathleen DeRosa Damman Scholarship was established by George H. and Kathleen DeRosa Damman, both Class of 1956. Preference for awards from this scholarship shall be given to talented scholar-athletes who participate in varsity intercollegiate golf and who have demonstrated financial need.

The Richard Darlington Memorial Fund was established by a bequest of Richard Darlington, Class of 1909, who served as a member of the Board of Trustees for 11 years, the income to be used to aid worthy and needy students.

The Joan & Nicholas Daviduk '49 Scholarship was funded by a gift from the estate of Nicholas Daviduk '49. Grants from the scholarship are awarded as scholarships to students in engineering and without restriction.

The K.H. “Happy” & Virginia Brandon Davis Scholarship was established by Virginia Brandon Davis, Class of 1936, in memory of her husband. The scholarship award shall be made without restriction.

The Nelson F. Davis Jr. Scholarship Fund was established by action of the Board of Trustees from residuary bequests in the estate of Harriet I. Johnson to honor a loyal member of the Class of 1922.

The Phoebe B. Davis Memorial Scholarship was established by Alice V. Davis, Class of 1925, to preserve the memory of her sister, Phoebe, a member of Bucknell’s Class of 1922. Preference for the scholarship award will be given to young women majoring in English who plan a secondary school teaching career.

The Dawson Family Scholarship was funded by a gift from Peter and Christina Dawson, parents of Miles Dawson, Class of 2012. Awards shall be made to a student based on financial need and without other restriction.

The Jeffrey, Julie Ann & Philip Dawson Scholarship was established by Chester S. and Julia Shank Dawson, Class of 1948, in loving memory of their children. Preference for the scholarship award will be given to students with an interest in art or music.

The Dehls Scholarship was established by Allan W. Dehls, Class of 1950, and his wife, Marjorie R. Dehls, to support one or more deserving undergraduate students showing particular promise in the field of art or music as recommended by either of the aforesaid departments and awarded by the Office of Financial Aid.

The Michael J. Delaney Scholarship was established by Michael J. Delaney, Class of 1952. The scholarship shall be awarded to students with demonstrated financial need, with preference for graduates of Greater Nanticoke Area High School (Nanticoke, Pa.) or for students who are residents of Luzerne County, Pa., and without other restriction.

The Della Cava Family Scholarship was created by gifts from Ralph and Geralyn Della Cava P’14, dedicated parents of Nichole Ann Della Cava, Class of 2014. Grants shall be made to students based on financial need and without further restriction.

The Virginia Reed Demoreuille '73 Memorial Scholarship was created by a gift from Jane Griffith, Class of 1943, in memory of her niece, Ginny, who graduated from Bucknell in 1973 with a degree in art and art history. The scholarship commemorates Ginny’s devotion to education and love for the arts and grants shall be made to students based on financial need with preference given to students in the College of Arts & Sciences.

The Denenberg Family Scholarship was established by Judy Plattman Denenberg, Class of 1957, and Byron A. Denenberg, Class of 1956. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Brenda Earl & Michael De Paola Scholarship was established in 2000 by Brenda Earl, Class of 1981, and her husband, Michael De Paola. Preference for the scholarship award shall be given to students enrolled in the College of Arts & Sciences who are judged to have the most pressing financial need and without other restriction.

The Gertrude J. Deppen Scholarship Fund was established by Joseph H. Deppen, Class of 1900, in memory of his sister, Class of 1902, the income to be used as scholarships for those who have resided in Mount Carmel for 10 years, who are graduates of Mount Carmel Public High School, who are not habitual users of tobacco, intoxicating liquor and narcotics, and who do not participate in strenuous athletic contests. Bucknell University will award scholarships to full-time graduate students under the terms and conditions of the Voris Auten Scholarship Fund and the Gertrude J. Deppen Scholarship Fund only if there are funds available from these endowments after awards have been made to undergraduate applicants. If funds are available, and graduate awards are to be authorized in any given year, public notice must be given in the Mount Carmel community newspaper and in appropriate ways at the Mount Carmel Public High School so that all college graduates who meet the requirements of these endowments and who wish to apply for such graduate scholarships would have an opportunity to do so.

The Dale A. & Carolyn M. Derr Scholarship was established by Dale A. Derr, Class of 1950, and his wife, Carolyn Melick Derr, Class of 1949. Preference shall be given to qualified students from Columbia County, Pa.

The Sarah H. Derr Scholarship was established in her memory by Dr. Ralph B. Derr, Class of 1917, the income to be awarded to a deserving student.

The Joe Diblin Scholarship was created by a gift from the Degenstein Foundation in honor of Joseph Armstead Diblin, Class of 1940. A World War II veteran, Joe worked for 25 years at Lycoming Engines as chief test pilot and later as director of public relations. Since his retirement in 1980, Joe has been a popular columnist for the Daily Item newspaper. Grants shall be made to students based on financial need and without further restriction.

The Woodward H. Diller Scholarship was established by Mr. and Mrs. William J. Diller and is to be awarded to a student who meets the academic standards of Bucknell University. Recipients shall be members of ROTC who are enrolled at the University, regardless of financial need.

The Gail E. Dobert Memorial Scholarship was established by friends and family of Gail E. Dobert, Class of 1983, whose life was tragically lost in Dubrovnik, Croatia, while on a government mission with Department of Commerce Secretary Ron Brown. Gail was a loyal and respected public servant all of her professional life, and helped and touched many Bucknellians' lives. Gail is missed dearly and will be remembered for her uplifting spirit, energy and passion for life. Preference for the scholarship award will be given to a Long Island, N.Y., student interested in a public service career, with special preference given to students participating in a semester of study in Washington, D.C.

The Robert W. & Lucy E. Donehower Scholarship was established by Robert W. Donehower, Class of 1942, and his wife, Lucy. The income from the fund shall be used to provide financial aid to students with demonstrated need and shall be awarded without restriction.

The Penny Rich Dorschel '67 Scholarship was created by gifts from Penny Rich Dorschel, Class of 1967, and her husband, James C. Dorschel Jr. Grants shall be made to students based on financial need and without further restriction.

The Drapeau Family Scholarship was created by gifts from Anne S. Drapeau, Class of 1988, and Robert Drapeau. Grants shall be made to students based on financial need, with preference given to students participating in Bucknell's Posse Program.

The Martin Drum Scholarship is available to junior college transfer students majoring in civil engineering.

The Jay Dugan Scholarship was established by the University in recognition of a gift of sculpture by Jay Dugan. The scholarship is unrestricted.

The Audrey Gay Dunbar Scholarship was created by gifts from J. Frank and Susan (Stoner) Brown, both Class of 1978, in memory of Susan's mother. A. Gay Dunbar graduated from Bucknell in 1953 with a bachelor of science degree in biology and worked for many years in the physical therapy field. During her graduate studies at the University of Pittsburgh, she was among the brave physical therapy and nursing students who volunteered to test Jonas Salk's polio vaccine, which virtually eradicated the disease. Grants shall be made to students based on financial need, with preference given to students majoring in biology or students interested in careers in health care.

The John David Duncan Memorial Scholarship was established in 1970 by his family and friends.

The John P. Dunlop Scholarship was established by Bucknell alumni and friends of John P. Dunlop, former dean of students. Preference for the scholarship award shall be given to those students demonstrating outstanding leadership to the Bucknell community such as was encouraged by John P. Dunlop.

The Steven S. Dyer Scholarship was established by Mr. and Mrs. Alexander P. Dyer and their friends in memory of their son. The scholarship is to be awarded to the student who meets the academic standards of Bucknell University and possesses leadership potential as evidenced by a combination of willpower, motivation and human relations skills.

The John D. Dzurinko Memorial Scholarship was established in 2005 by family and friends of John D. Dzurinko, Class of 1981. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Brenda Earl '81 Merit Scholarship was created by gifts from Brenda Earl, Class of 1981. The scholarship is competitively awarded to high-achieving, academically excellent student leaders who are seeking degrees in the humanities, social sciences, sciences or mathematics.

The W. Warren Egee Memorial Scholarship was established by Mrs. Egee to honor the memory of her husband, Class of 1938. Preference for the scholarship award will be given to qualified and needy students enrolled in the College of Engineering, especially mechanical, electrical or chemical engineering.

The Ehrlich Family Scholarship was created by gifts from Scott Ehrlich, Class of 1993, and Deborah Dougherty. Grants shall be made to students based on financial need, with preference for students in the Freeman College of Management.

The David D. Ekedahl Scholarship was established by Retailer Financial Services, a unit of GE Capital, to honor David D. Ekedahl, a Bucknell trustee and member of the Bucknell Class of 1956, on the occasion of his retirement from GE Capital. Awards from this scholarship will be made without restriction.

The Ekedahl Family Scholarship was established by Dave Ekedahl, Class of 1956, and his wife, Patty Ekedahl. Preference for the scholarship award shall be given to students whose ethnic, racial, economic or national origins add to the diversity of Bucknell.

The David & Dianne Elderkin Scholarship was established in 2003 by David F. and Dianne G. (Brown) Elderkin, both members of the Class of 1975. The scholarship award shall be made without restriction.

The Frederic S. & Carol Cobb Elliott Scholarship was established by Frederic S. Elliott, Class of 1961, and Carol Cobb Elliott, Class of 1963. Preference for the scholarship award shall be given to students with demonstrated financial need and without other restriction.

The Ira T. Ellis Jr. Scholarship for the College of Engineering was established by Ira T. Ellis Jr., Class of 1956, to benefit students with demonstrated financial need. Preference for the scholarship award shall be given to students enrolled in the College of Engineering, with special preference given to those students majoring in electrical engineering.

The Warren E. & Nora G. Elze Scholarship was established by Warren and Nora Elze, members of the Class of 1948. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Ernest Family Scholarship was established by Russell G. Ernest, Class of 1942; his wife, Matty Ernest; and their son, Richard C. Ernest, Class of 1970; his wife, Susan; and their daughter, Deborah, Class of 1999. The scholarship shall be awarded to students with demonstrated financial need who are majoring in engineering, the sciences or the management department curricula.

The Evans Family Scholarship was created by gifts from Bill '80 and Bobbie '82 Evans. Grants shall be made to students based on financial need and without further restriction.

The Everett Scholarship for the College of Engineering was established by Russell W. Everett, Class of 1916, as a tribute to his parents, Mr. and Mrs. Alexander David Everett; his brothers, Harry S. Everett, Class of 1912, and Mark R. Everett, Class of 1920; and his daughter, Ruth Everett Sierzega, Class of 1945. The income from the fund is to be awarded to deserving students in the College of Engineering.

The Margaret D. Ackerman & Ruth Ackerman Fairbairn Scholarship was established by Margaret D. Ackerman, Class of 1925, in memory of her sister, Ruth Ackerman Fairbairn, Class of 1927. Preference for the scholarship award shall be given to students majoring in classics or minoring in Latin, Greek or classical civilization.

The Winifred P. Farquhar Scholarship was established in 2000. The scholarship award shall be made without restriction.

The Samuel Farwell Scholarship was established by Samuel S. Farwell for pre-ministerial students recommended by the Department of Religion.

The Barbara Reed Feeser '80 Memorial Scholarship was established in 2010 by Barbara's family, classmates and friends who remember the joy that Barbara experienced in the cultivation of her musical talent and how memorably she enriched the Bucknell campus with her exuberant voice. Barbara was a dedicated academician and scientist by training, but she looked for every opportunity to enhance her life through singing thereby also enriching the lives of others, especially her family and friends. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

The Barbara A. Feldmann '68 Scholarship was funded by a gift from Barbara A. Feldmann. Awards shall be made to students based on financial need, without further restriction.

The Kevin Felix & Tina Paraskevas Felix Scholarship was funded by gifts from Kevin '90 and Tina Felix, dedicated parents of Alex and Nikki Shea, both Class of 2012. Grants shall be made to students based on financial need.

The Brian C. & Catherine A. Ferguson Scholarship was created by gifts from Brian Ferguson, Class of 1990, and Catherine A. Ferguson, dedicated parents of William C. Ferguson, Class of 2021. Grants shall be made to students based on financial need and without further restriction.

The Robert P. Fetch '75 Scholarship was funded by a gift from Bob Fetch, Class of 1975. Grants shall be made to students based on financial need, without further restriction.

The Bradley J. Fetchet September 11th Memorial Scholarship was established in 2003 by the Bradley J. Fetchet Memorial Foundation, the Fetchet family and Brad's friends to honor the memory of Bradley J. Fetchet, Class of 1999, who perished in the attacks on the World Trade Center in New York City on Sept. 11th, 2001. Brad was a dedicated young man with a special twinkle in his eye and an unending smile who often said, "You can tell the

character of a man by what he does for the man who can offer him nothing." This scholarship shall be awarded to a student with financial need, with special preference to student-athletes who best exemplify the qualities that made Brad so special: his spirit of enthusiasm, compassion, love of life, and commitment to family, friends, community and especially those in need.

The Pauline & David Fletcher Scholarship was created by a gift from David Fletcher in memory of his wife and colleague, Pauline Fletcher, as a tribute to their interdisciplinary course Science and Literature, the forerunner of interdisciplinary course offerings at Bucknell. Grants shall be made to students based on financial need, with preference given to first-generation students majoring in English or biology.

The Edwin & Florence Fetterman Scholarship was established by their daughter, Anna Fetterman Gutekunst, Class of 1944. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who have demonstrated service to Bucknell and/or the surrounding community and without other restriction.

The Figgie Family Scholar Athlete Fund was funded by a gift from Mark, Class of 1978, and Connie Figgie, dedicated parents of Mark P. Figgie Jr., Class of 2012, and Patrick O. Figgie, Class of 2016. Awards shall be made to varsity baseball or varsity men's soccer student-athletes based on academic merit. The scholarship was established to recognize Bucknell's commitment to students who achieve academic and athletic excellence.

The 1957 Fiji Scholarship was established by graduating members of the 1957 Phi Gamma Delta fraternity in gratitude for the role Bucknell has played in their lives. The scholarship shall be awarded to a man or woman with demonstrated financial need, who shows academic promise, and whose activities and behavior reflect positively on the University. Special preference shall be given to members of Phi Gamma Delta fraternity.

The Martha A. Fisher Scholarship was established by an estate gift from Martha A. Fisher, M.A. 1943. Preference for the scholarship award shall be given to needy and deserving students and without other restriction.

The Flannery Family Scholarship was created with gifts from members of the Bucknell community to honor Pat '80 and Patti '86 Flannery's distinguished service and dedication to Bucknell. Grants shall be made to students based on financial need.

The Aldus Fogelsanger Scholarship was established by Sarah Slaughenhaup Madison, Class of 1941. Preference for the scholarship award will be given to students in the College of Engineering with demonstrated financial need.

The Joanne E. Lewis Forsyth & Family Scholarship was established in 1998 by Kenneth J. and Nancy J. Lewis, parents of Joanne E. Lewis Forsyth, Class of 1995. The scholarship shall be awarded to students with demonstrated financial need. Preference shall be given to talented student-athletes, with special consideration given to student-athletes from California or the West Coast, whose ethnic, racial, economic or national origins add to the diversity of Bucknell. The scholarship award shall be made without other restriction.

The John Edward Fowler Memorial Scholarship was established in 1989 by the John Edward Fowler Memorial Foundation. Preference for the scholarship award will be given to academically qualified, needy students matriculating from the Washington, D.C., metropolitan area.

The Charles Winslow Frampton Scholarship was created by a bequest from Elma C. Frampton, widow of Charles W. Frampton, Class of 1931. Charles Frampton was a lawyer and legal scholar who held the position of administrator of orphans' court in Philadelphia, Pa. Awards from the scholarship will be made to Bucknell University students with demonstrated financial need.

The Frantz Family Scholarship was created by a gift from Scott and Allison Frantz in honor of their son, Hunter Frantz, Class of 2019. Grants shall be made to students based on financial need, with preference for students from regions that will increase the geographic diversity of the University.

The A. Guy Freas Scholarship was established by Arthur K. Freas, Class of 1948, and Margery H. Freas, to honor the memory of A. Guy Freas. Awards from the scholarship shall be granted to students with demonstrated financial need.

The Bruce J.S. & Naomi G. Freed Scholarship was established in 2006 by their family and friends to honor lifelong students and educators. The scholarship honors Naomi, Class of 1952, and remembers Bruce, Class of 1957 (M.A.), a longtime mathematics faculty member and registrar for the University in the year of his passing. This scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Freeman-McCaskie Scholarship was originally established as the McCaskie Scholarship by Evelyn H. McCaskie, Class of 1911, in appreciation of the educational opportunities Bucknell University offered her and her sisters, Carrie and Florence, both Class of 1906. In 1997, it was renamed to reflect the interest and support of the scholarship by Kenneth W. Freeman, Class of 1972, and to honor his parents, James E. and Elizabeth McCaskie Freeman (cousin to the McCaskie sisters). The scholarship will provide assistance to worthy students, with preference given to those who have demonstrated proficiency in music, French or Spanish.

The Marcia R. Fremont Scholarship was established by gifts from the family and friends of Marcia R. Fremont, Class of 1950. It is to be awarded to a student majoring in science.

The Michael M. & Lillian A. Fremont General Scholarship was established in 1997 through a bequest from Michael M. Fremont, a friend of the University. The scholarship shall be awarded to full-time students with demonstrated financial need and without other restriction.

The Michael M. & Lillian Amber Fremont Scholarship was established through gifts from Michael M. Fremont and is intended to prepare students to promote international understanding and further cooperative relationships between the United States and other nations. Preference for the

scholarship will be given to undergraduate students who are citizens and residents of countries other than the United States; interested students must make specific application for this award.

The Frank O. Freund & Edna M. Freund Memorial Scholarship was created by gifts from the estate of Katherine Phillippa Freund, Class of 1944, in memory of her parents. Grants shall be made to students based on financial need and without further restriction.

The Albert L. & Edward Friedman Memorial Scholarship Fund was established by a bequest from Edward Friedman, the income from which is to be awarded to a student requiring financial assistance.

The Leo & Kathryne E. Friedman Memorial Scholarship was established through an estate gift from Leo and Kathryne Friedman. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Fries Family Scholarship was created by gifts from Marilyn Fries, Class of 1959, and James Fries, Class of 1958. Grants shall be made to students in the College of Engineering based on financial need.

The Elizabeth Stage Fulton Scholarship was established through a bequest from her daughter, Margaret Fulton Connors, to preserve the memory of Elizabeth Stage Fulton, a member of Bucknell University's Class of 1911. Elizabeth followed her sister, Anna Stage Hoffman, Class of 1908, to Bucknell from their home in Clearfield. Both returned home to central Pennsylvania to teach, raise families and share a love of literature, drama and spiritual growth. The sisters were lifelong friends. The scholarship honors Elizabeth for her intellectual curiosity and devotion to family. The scholarship is to be awarded to needy and deserving students of Bucknell University, without other restriction.

The G Endowed Scholarship was created by the **G**iglio and **G**ruver families, who were brought together by Goldman Sachs and who share a tradition of military service to the United States. Grants shall be made to students based on financial need, with preference given to veterans of the United States Armed Forces (GIs). Those veterans enrolled at Bucknell as participants of the Community College Scholars program shall be given the highest preference for need-based grants.

The Kenneth Gans Memorial Scholarship was created by gifts from Vivian Gans P'83, P'88 in memory of her husband, Kenneth, who graduated from Bucknell in 1956 with a bachelor of arts in chemistry. Kenneth and Vivian are the parents of two Bucknellians: Rick Gans, Class of 1983, and Marge Gans Kalfon, Class of 1988. Grants shall be made to students based on financial need and without further restriction.

The James M. Gansinger '67 Scholarship was created by a gift from James M. Gansinger, Class of 1967. Grants shall be made to students based on financial need and without further restriction.

The Alan D. Gardner Memorial Scholarship was established by family and friends to commemorate the demonstrated loyalty of Major Gardner, Class of 1962, to his country, University and fellow citizens, and is to be awarded to a student of proven academic excellence with a potential for strengthening campus extracurricular programs and for responsible community involvement following graduation.

The Warren D. & Esther S. Garman Scholarship was established by a bequest from the estate of Esther Selsam Garman. Awards from the scholarship are to support students in engineering with demonstrated financial need.

The Norman E. & Mary Lou Garrity Family Scholarship was established by Norman E. Garrity, Class of 1963, and Mary Lou Roppel Garrity, Class of 1964. The scholarship shall be awarded to students with demonstrated financial need, with preference given first to descendants of Norman E. and Mary Lou Garrity, and then to graduates of Tamaqua High School (Tamaqua, Pa.) or Steel Valley High School (Munhall, Pa.).

The Gasper/Peterec Scholarship was established by Barbara L. Gasper, Class of 1976, to honor Professor Richard J. Peterec's years of service as a teacher and mentor and to help realize his wish that Bucknell students become "Citizens of the World." Grants shall be made to students with financial need to support their ability to study abroad.

The Sue Ann Geisler Scholarship was established by her parents, F. Ellis and Jane Sutherland Harley '59/'60, and other friends and family members, to honor the memory of Sue Ann, a member of Bucknell's Class of 1986. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in international relations.

The Gegnas/Perricelli Family Scholarship was created in 2017 by Susan Gegnas Perricelli '94 and Scott Perricelli '94 in honor of their parents, Ed and Adelene Gegnas and Anita and Anthony Perricelli, who between them had six children graduate from Bucknell. Grants shall be awarded to students based on financial need, with preference for students majoring in management or psychology.

The Gibb Foundation Scholarship was established by gifts from the foundation beginning in 1986. The scholarship is to be awarded without restriction.

The James A. Gibson Memorial Scholarship was created by gifts from Linda Gibson, Class of 1970, and her husband, Roy Shanker, in memory of Linda's father. Grants shall be made to students based on financial need, with preference given to female students pursuing education in a STEM (Science, Technology, Engineering or Math) field.

The Francis Gilbert Scholarship Fund was established in 1951 by Dr. Irving Berlin, Honorary 1940, in memory of his lifelong friend, the income to be awarded annually to worthy and needy students in the Department of Music.

The Susan Deland Ginkel Scholarship was funded by a gift from Susan D. Ginkel, Class of 1976, and her husband, Christopher H. Lee. Awards shall be made to students based on financial need with no preference.

The Global Scholars Program was created by a gift from the JSM Charitable Trust on behalf of Kitty McDonnell Pipoli '94 and her parents, James and Elizabeth McDonnell P'94. Grants shall be made based on financial need to students who participate in study abroad programs.

The Glover Family Scholarship was created by gifts from Andy and Amy Glover, Class of 2000. Grants shall be made to students based on financial need and without further restriction.

The Leslie Kayfetz Gordon Memorial Scholarship was established by Judith Menapace Haverty and Elizabeth Smith Mao, both Class of 1971, to preserve the memory of their fellow classmate who died of breast cancer at a premature age. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The H. Lynn & Dorothy Mae H. Goughnour Scholarship was established by H. Lynn Goughnour, Class of 1932. The scholarship award will be made without restriction.

The Sidney Grabowski Scholarship was established by the children and grandchildren of Sidney Grabowski, Class of 1915. Preference for the scholarship award shall be given to students residing in Lackawanna or Luzerne counties, Pa.

The Grahn, Bell, Carey Scholarship was established in 2010 by John D. Madison, Class of 1981, and Karen A. Seymour-Jones Madison, Class of 1980, in honor of Karen's uncle Harold "Bud" W. Grahn Jr., and in tribute to his lifelong friendship with Class of 1950 members William W. "Bill" Bell and William O. "Pat" Carey. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Gravina Family Scholarship was created by a gift from Thomas and Tracey Gravina, dedicated parents of Thomas J. Gravina Jr., Class of 2020. Grants shall be made to students based on financial need, with preference given to students majoring in management or the arts.

The Matthew G. Gray & Ellen P. Gray Scholarship was established in 2000 by a bequest from Ellen Phebey Davis, Class of 1933. The scholarship shall be awarded to students with demonstrated financial need, with preference for students from Luzerne County, Pa.

The Green Family Scholarship was established in 2000 by Bradford '59 and Rhoda Green. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Robert B. Greer II Memorial Scholarship was established by the family, friends and classmates of Robert B. Greer II, Class of 1986, to honor his memory. The scholarship award shall be made without restriction.

The Greiner Family Scholarship was funded by a gift from Kenneth J. Greiner, Class of 1967, and his wife, Rande Greiner, dedicated parents of Matthew S. Greiner, Class of 1993. The scholarship will significantly enhance Bucknell's arts program by allowing the University to successfully recruit and enroll vibrant arts merit students who have demonstrated a passion for studio art, art history or theatre. The infusion of talented students as a result of this scholarship will enrich the campus community.

The Roy & Ariel Griffith Memorial Scholarship was established by Jane W. Griffith, Class of 1943, in memory of her parents. The scholarship award shall be given to needy and deserving students with preference given to those enrolled in the pre-med program.

The Griffith Family Scholarship was established by Dr. Bartley P. Griffith, Class of 1970, and Denise C. Griffith, and Bartley P. Griffith Jr., Class of 1997. The scholarship shall be awarded to students with demonstrated financial need, with preference for students participating in intercollegiate athletics, particularly football and/or men's lacrosse.

The George G. Groff & Margaret M. Groff Scholarships were established by a bequest from the estate of Frances L. Groff, of the Institute Class of 1907, in memory of her parents. The income from one of the scholarships is to be used for a deserving woman who plans a career in medicine.

The Margaret Beaver Groff Scholarship was established by a bequest from the estate of Frances L. Groff, of the Institute Class of 1907, in memory of her sister, Class of 1904, the income to be used for a deserving man who plans a career in medicine.

The Robert R. Gross Scholarship was established by James E. Nevels, Class of 1974, and his wife, Lourene Dellinger Nevels, Class of 1974, in honor of Robert Gross, professor of English. The scholarship award shall be made without restriction.

The William R. Gruver Scholarship was funded by a gift from Glenn R. Fuhrman in honor of management Professor Bill Gruver, holder of the Howard I. Scott Chair in Global Commerce, Strategy & Leadership at Bucknell. Awards shall be made to students based on financial need, without restriction.

The Robert G. Guempel Family Scholarship was established by Robert G. Guempel, Class of 1948. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Art Gulden Scholarship was established by cross country and track & field alumni, family and friends to honor Art Gulden on the occasion of his 25th anniversary as coach of Bucknell University's men's and women's cross country and track & field teams. Preference for the scholarship award shall be given to a member of the cross country or track & field teams.

The H. Dean Gulnac Scholarship was established by H. Dean Gulnac, Class of 1940. Preference for the scholarship award shall be given to students enrolled in the College of Engineering.

The Clarence Kent & Marilla Stouck Gummo Scholarship was established in their memory by their son, Blanchard Gummo, professor of art, with preference given to students majoring in art. Descendants of Mr. and Mrs. James Ambrose Gummo and Ella Blanche Counsil Gummo, and of Mr. and Mrs. Murray Jesse Stouck and Ida Jennette Clark Stouck, are to be given first consideration if they should be accepted by Bucknell University.

The Arthur A. Haberberger Jr. '87 & Karen M. Spano '88 Scholarship was established in 2005 by Joanne and Arthur Haberberger Sr. The scholarship shall be awarded to students with demonstrated financial need, with preference to students who are majoring in sociology or computer science.

The Linda Thompson Hager Scholarship was established by a bequest from Linda Thompson Hager, Class of 1959. Preference for the scholarship award shall be given to students with demonstrated financial need who are graduates of Hightstown High School, in Hightstown, N.J., or if none qualify, then to graduates of high schools in Mercer County, N.J.

The Velola E. Hall Scholarship was established by The Rev. Henry Chandler Hall, A.M., Class of 1882, in memory of his daughter, Class of 1904, for a college woman.

The Allen & Dorothy Hamburg Scholarship was established by Allen E. Hamburg, Class of 1939, in memory of his wife, Dorothy Gottschall Hamburg, Class of 1940, for students with demonstrated financial need who maintain at least a 3.00 (B) grade point average at Bucknell. Preference for the scholarship award shall be given to students who graduated from Hatboro-Horsham Senior High School in Horsham, Pa.

The James H. Hand '26 & Edna Watson Hand '27 Scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Robert S. Harder Scholarship was established by Robert S. Harder, Class of 1959, in memory of his parents, Howard L. and Rheta S. Harder. The scholarship shall be awarded to students with demonstrated financial need, with preference for students from Union, Lycoming, Snyder and Northumberland counties.

The John H. Hare Scholarship was established in 1906 by his loving father. The scholarship shall provide annual financial assistance to a worthy student, with first preference to a student planning to enter the ministry. If the preference cannot be met, the award shall be made without restriction.

The Max & Bessie Harris Scholarship was funded by bequests from their daughter, Mary E. Harris, Class of 1920, and son, Louis H. Harris, Class of 1917. Awards from the scholarship shall be made to graduates of Lewisburg High School.

The John Howard Hart Scholarship was established by a bequest from Samuel A. Hart, Class of 1903.

The Andrew Hartman (Class of 1971) Scholarship was established in 2002 by the Ruth and Ted Bauer Family Foundation. The scholarship shall be awarded to students with demonstrated financial need who are United States citizens, with preference for students who are the sons or daughters of a public school teacher.

The Hartman & Sanders Family Scholarship was established in 2000 by Jill Sanders Hartman '75, John Hartman, the Hartman Foundation, Elizabeth Kulp Sanders '51, and Karen Sanders Feather '78, in memory of Daniel T. Sanders '52. The scholarship shall be awarded to students who are U.S. citizens with demonstrated financial need, with preference given to students of high academic standing who are majoring in engineering, a physical science or mathematics, or who are majoring in education with specific intent to teach one of the above listed disciplines.

The Edwin Dudley Hartman Service Memorial Scholarship was established by gifts from the family and friends of Mr. Hartman, Class of 1970, the income to be used to aid students who desire to be of service to individuals and society, and who are in serious financial need.

The Berkeley V. Hastings & Frances Steel Hastings Scholarship, established by a bequest from Berkeley V. Hastings, Class of 1913, and by contributions from George F. Hulse Associates, the income to be used for scholarships, with preference given to students coming from Milton, Pa., and its vicinity, and to pre-ministerial students.

The Hauck Family Scholarship was established in 1999 by Edward A. Hauck, Class of 1975, to support the education of future Bucknell students. The scholarship honors his parents, Willard D. and Charlotte Y. Hauck, who recognizing the value of education, made sacrifices to support his studies at Bucknell. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Barbara (Stutzman) Hawley '57 Scholarship was funded by a gift from Barbara Hawley, Class of 1957. Grants shall be made to students in the College of Arts & Sciences based on financial need, without further restriction.

The Harold W. Hayden Scholarship was established by Stanley G. Williams, Class of 1943. The scholarship award will be made without restriction.

The Howard E. Hayden Memorial Scholarship was established in 2000 by his family. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in English, history or pre-theological studies.

The William Randolph Hearst Foundation Scholarship Fund was established in 1998 by the William Randolph Hearst Foundation. The scholarship shall be awarded to a deserving first-generation student.

The Ephraim M. Heim Scholarship was established by Robert C. Heim, Class of 1924, in memory of his father, the income to be used for a deserving student, with preference given to those in business administration.

The Heinemann Family Scholarship was established by Trustee Kirsten S. Heinemann, Class of 1981, and Steven D. Heinemann, dedicated parents of Andrew F. Heinemann, Class of 2012, and Erik Leister Heinemann, Class of 2015. Awards shall be made to students based on financial need, with preference given to varsity men's or women's swimmers.

The Catherine Vaughan Hellerman Scholarship was established by Stephen W. Vittorini, Class of 1979, in memory of his grandmother and great-grandfather, Charles P. Vaughan, acting president of Bucknell University in 1931. Preference for the scholarship award shall be given to a student or students from the Philadelphia area whose ethnic and economic origins add to the diversity of the University. It is the donor's wish that the scholarship recipient(s), upon graduation, expect to use their learned skills and knowledge to enhance the economic and cultural well-being of communities similar to those from which they were selected.

The Robert & Patricia Reish Hemphill Family Scholarship was established in 1999 by Robert B. Hemphill, Class of 1958, and Patricia Reish Hemphill, Class of 1959. The scholarship shall be awarded to students with demonstrated financial need, with preference for students from Union County, Pa.

The John W. & Amy M. Henneberger & Dr. Sara Chubb Schaaf '43 Scholarship was established by gifts from Dr. Lois M. Henneberger, Class of 1943, in memory of her parents and friend and classmate. The scholarship shall be awarded to students with demonstrated financial need, with preference for students in the pre-medical program who are juniors or seniors and without other restriction.

The Andrea Trout Herget Dance Scholarship was created by a gift from Leanne Freas Trout, Class of 1950, in memory of her daughter. The scholarship will strengthen Bucknell's dance program by enhancing the University's ability to recruit students who have demonstrated excellence in dance. Awards shall be made to students based on their merit in dance.

The Ruth Mount Herrel Memorial Scholarship was established by Mrs. B.A. Ives to honor the memory of her mother, a member of Bucknell's Class of 1921. Preference for the scholarship award will be given to returning and older students.

The Terry J. Hibbard Mechanical Engineering Scholarship was created by gifts from Terry J. Hibbard, Class of 1971. Grants shall be made to students based on financial need, with preference for students majoring in mechanical engineering.

The Paul A. Hightower Scholarship was established by Stanley G. Williams, Class of 1943. The scholarship award will be made without restriction.

The Horace A. Hildreth Scholarship was established in 1999 by his daughter, Josephine H. Detmer, Class of 1952, to honor the memory of Mr. Hildreth, Bucknell's ninth president. The scholarship shall be awarded to students with demonstrated financial need, with first preference given to students from Maine or students enrolled in programs that may lead to careers in government service.

The C. Clayton Hill Ministerial Memorial, created by Norman B. Hill, Class of 1917, in memory of his brother, Class of 1929, provides that the income be awarded as a scholarship to a pre-ministerial student who shows proficiency in the study of the Bible and who is worthy of assistance.

The Hills Family Scholarship was established in 2004 by Frederick J. and Jean Lambert Hills, both Class of 1961, in memory of Robert and Katherine Hills. The scholarship award shall give preference to students enrolled in the College of Engineering.

The William A. Hinkle '48 Memorial Scholarship was established by his wife, Patricia Hungerford Hinkle, for the support of an upper-class student in chemical engineering.

The Dr. Gary Hochberg & Dr. Robert Gross Scholarship was funded by gifts from an anonymous donor in honor of Bucknell professors Dr. Gary Hochberg (philosophy) and Dr. Robert Gross (English). Grants shall be made to students based on financial need, without restriction.

The Hislop Family Scholarship was created by gifts from Thomas P. Hislop Jr., Class of 1978, and Julie Hislop and James A. Hislop, Class of 1979, and Janet M. Hislop, Class of 1978. Grants shall be made to students based on financial need, with preference given to students pursuing a management major.

The Robert Hoff Family Scholarship was established in 2000 by Robert A. Hoff, Class of 1974. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Benjamin Hoffman Scholarship was established by the family in memory of Benjamin Hoffman, Class of 1952, the income to be awarded to any student who displays financial need.

The Holiat Family Scholarship was created by a gift from George and Dina Holiat, Class of 1990. Grants shall be made to students based on financial need and without further restriction.

The Holmes Family Diversity Scholarship was established in 2003 by Stephen P. Holmes and Bonnie L. Holmes, both members of the Class of 1979. Grants from the scholarship will be awarded to students whose ethnic, racial, economic, geographic, cultural or national origins add to the diversity of Bucknell.

The Stephen P. Holmes Scholarship was created by gifts from Wyndham Worldwide Corp. Board of Directors in honor of Steve's many years of dedicated service and leadership as Wyndham's chairman and CEO. A member of the Class of 1979, Steve is an officer on Bucknell's Board of Trustees and longtime supporter of the University. Grants shall be made based on financial need to students in the College of Management.

The Hoover Math Scholarship was established in 2010 by John C. Hoover, Class of 1982. The scholarship will be used preferentially to recruit and retain students with demonstrated interest and superior abilities in mathematics and its creative application.

The Daris Bracey Hosler Scholarship was established in 1999 by Daris Bracey Hosler, Class of 1931. The scholarship shall be awarded to students with demonstrated financial need, with preference given to students majoring or minoring in the classics.

The Marguerite Brierly Hough Scholarship was established by an estate gift from Mrs. Hough, Class of 1923, in recognition of the benefits she received from the University. Preference for the scholarship award will be given to junior and senior students in the College of Engineering.

The Richard H. Howard Scholarship was established in 2004 by Richard H. Howard, Class of 1964, in gratitude for the role Bucknell has played in his life and in honor of his 40th Reunion. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in chemical or biomedical engineering and without other restriction.

The Alfred C. Howell Scholarship was established by John R. Gregg in memory of his stepfather, Alfred C. Howell, a former trustee of Bucknell University. Mr. Howell's love of poetry and his lifelong interest in book collecting prompted the guidelines for this scholarship. The scholarship shall be awarded to students with demonstrated financial need who are majoring in English.

The Charles E. Howell Memorial Scholarship was established by Bucknell students under the auspices of the Bucknell Student Government and by the friends and family of Charles Howell, a member of Bucknell's Class of 1990. As a minority student, an academically superior engineering student, football player and outstanding citizen of the University community, Charles Howell set an example for all Bucknellians. This scholarship will be awarded annually to a student who best represents the qualities Charles exhibited before his untimely death in 1987.

The J. Preston Hoyle M.D. Scholarship was established in 2007 by June M. Hoyle and their children: Lynn, Jeff and Susan '88. The scholarship honors Dr. J. Preston Hoyle's 30 years of service at Bucknell as medical director, associate physician, and sports team doctor. In his gentle manner, Dr. Hoyle cared for countless students and community members. He left his mark as someone to whom students and faculty could turn for support that went beyond just medical advice. He was a true asset to the Bucknell community. In recognition of the fact that Preston and June worked to pay for their own education, the scholarship shall be awarded to students who demonstrate financial need.

The Hoyt Family Scholarship was established by Brian Hoyt, B.S. and B.A. Class of 1987, M.S. Class of 1992, and his wife, Carolyn Merl Hoyt, B.S. Class of 1987, through the generosity of George W. Hoyt. In keeping with the significant opportunities that the five-year engineering program provided Brian, the scholarship shall be awarded to an engineering student, with preference given to a student enrolled in the five-year engineering program in liberal arts and engineering, and first preference given to students in their fifth year of that program.

The Robert D. Hunter Scholarship was established in 1991 by members of Accounting Firms Associated Inc. to honor one of its founders, Robert D. Hunter, a member of the Class of 1949 and a University trustee from 1973-1978, on the occasion of his retirement. Preference for the scholarship award shall be given to a junior or senior student majoring in accounting who plans to become a certified public accountant.

The Idleman Family Scholarship was established by Lee H. Idleman, Class of 1954. The income is to be awarded to worthy and needy students, without restriction.

The George A. & Frances M. Ingald Scholarship was established by their daughter, Carol Anne Ingald, Class of 1978, in honor of their 50th wedding anniversary. The scholarship shall be awarded to students with demonstrated financial need, with first preference for students majoring in mechanical engineering or economics.

The Helen Shaffer Iredell Scholarship was established by an estate gift from Charles V. Iredell, Class of 1920, in memory of his wife, Helen Shaffer Iredell, Class of 1918. The scholarship award shall be made without restriction.

The Donald N. Isken '75 Family Scholarship was funded by a gift from Donald, Class of 1975, and Patricia Isken, parents of Ashley Lauren Isken, Class of 2012. Awards shall be made to students based on financial need, with preference given to students who reside in Delaware.

The Randi S. Jacobs Scholarship was established through a bequest from Randi S. Jacobs, Class of 1977. The financial aid grant shall be awarded to students with demonstrated financial need, without other restriction. The scholarship will be awarded with a preference for female students, but the University may disregard this preference if it is determined to be contrary to law or University policy.

The Joan Carol Jacobsen Scholarship for the Arts was established in 2007 as an endowed scholarship by action of the Board of Trustees out of a residuary bequest from the estate of Joan Jacobsen, Class of 1952. Awards from the scholarship shall be granted to art students.

The Robert F. Jaegle Memorial Scholarship shall be awarded to meritorious students with need who are majoring in accounting.

The Frances Theiss James Scholarship was established by T. Garner James in memory of his wife, a member of the Class of 1940. The scholarship award will be made without restriction.

The Jenkins Family Scholarship was created by a gift from Scott, Class of 1985, and Lori Jenkins, dedicated parents of James F. Jenkins, Class of 2018, and Jennifer L. Jenkins. Grants shall be made to students based on financial need, without further restriction.

The Edward F. Johnson Jr. Scholarship was established by relatives and friends in memory of Edward F. Johnson Jr., Class of 1951, the income to be used to aid a worthy and needy student.

The Marion E. Mayfield-Johnson & Edward M. Johnson Scholarship was established by Marion E. Mayfield-Johnson, Class of 1949, and her husband, Edward M. Johnson. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Lewis E. Jones Scholarship was established by a legacy of Lewis E. Jones for a student of Welsh descent.

The Lloyd H. Jones/Lehigh Electric Engineering Scholarship was established by Lloyd H. Jones M.E. '72 and Lloyd Jones E.E. '49. The scholarship shall be awarded to students with demonstrated financial need, who are pursuing engineering degrees and are U.S. citizens, with a preference for students in the mechanical or electrical/electronic engineering departments.

The Rockefeller Jones Fund was bequeathed to the University by a legacy of Elizabeth B. Jones in memory of her husband, Thomas Rockefeller Jones, Class of 1862, the income to be used as scholarships for two young men of good moral character.

The John T. Judd Scholarship was established by a bequest of Anna C. Judd in memory of her father, John T. Judd; it is to be made available to Baptist students of good character.

The Dr. John T. Judd General Scholarship was established by his grandson, James W. Shields, to honor Dr. Judd and the many members of the Shields family who have graduated from Bucknell. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Deborah Juran Scholarship was created by gifts from Deborah Juran, Class of 1971. Grants shall be made to students based on financial need and give preference to first generation college students.

The Edith Phillips Kalp Scholarship was established by Margaret E. Kalp in memory of her mother, the income to be awarded annually to such individual as the Scholarship Committee deems advisable.

The William Lawrence Kalp Scholarship was established by Margaret E. Kalp in memory of her father, the income from which is to be awarded annually to such individual as the Scholarship Committee deems advisable.

The Dr. Carl G. Kapp Memorial Fund was established through a bequest from Irma Kapp Rich in memory of her brother, a member of the Class of 1925. The income from this fund shall be used to provide interest-free loan awards to deserving students who are enrolled in the pre-medical program, have completed their freshman year in this curriculum, and have demonstrated financial need. Student recipients of a loan award have a moral, but not legal obligation to repay the loan award when they are able.

The William Charles '53 & Balbina Ann Kashatus Scholarship was funded by a gift from Dr. William Charles Kashatus, Class of 1953, and his wife, Balbina Ann Kashatus. Grants shall be made to students based on financial need and without further restriction.

The Clara M. Kauffman Scholarship was established by a bequest from Carson W. Kauffman, Class of 1940. Preference for the scholarship shall be given to students of good character and high scholastic standing enrolled in the College of Engineering or in science programs. Students who are orphaned or who have but one living parent shall receive first consideration.

The Keech Family Scholarship was established by the Rev. Dr. Finley M. Keech, Class of 1949, and Catherine L. Keech, Class of 1947, in memory of his father, the Rev. Dr. Finley Keech, Class of 1922 (D.D. 1942); Mary Elizabeth Peifer Keech, Class of 1924; and his uncle, George T. Keech Jr., Class of 1915. The scholarship shall be awarded to students with demonstrated financial need and without further restriction.

The Alexis W. Keen Scholarship was established by an estate gift from Mr. Keen, Class of 1913. The scholarship award will be given to students residing in Wayne Township, Passaic County, N.J.

The Allan & Bette Kenzie Scholarship was established in 2000 by Allan G. and Bette Skow Kenzie '57/'56. The scholarship shall be awarded to students with demonstrated financial need, with preference for students whose ethnic, racial, economic or national origins add to the diversity of Bucknell.

The W.K. Kellogg Foundation Scholarship was established by the W.K. Kellogg Foundation for women preparing to enter nursing or medical technology.

The Edward Gridley Kendall Scholarship was established by a bequest from Grace W. Kendall in memory of her husband, to be used to aid deserving men.

The S. Bruce & Betty Eyler Kephart Scholarship was established by S. Bruce Kephart, M.D., Class of 1939, and his wife, Betty Eyler Kephart, Class of 1940. The scholarship award will be made without restriction.

The Olga "Ollie" Grilli Keyes '56 Scholarship was established with gifts from John W. Keyes, Class of 1958. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Barrett Killian Family Scholarship was created by gifts from Jennifer Barrett, dedicated parent of Thomas (TJ) Killian, Class of 2023. Grants shall be made to students based on financial need and without further restriction.

The Jai Kim Engineering Scholarship was created by gifts from Dan J. Ertel and William P. Krokowski, both Class of 1984, in honor of their mentor, Professor Emeritus Jai Kim, who taught civil and environmental engineering from 1966 to 2009. Grants shall be made to students in the College of Engineering based on financial need.

The Donald James King '58 Scholarship was created in memory of Donald through gifts from his wife, Jane Vetter King, Class of 1958. Grants shall be made to students in the College of Management based on financial need.

The M. Elizabeth King Scholarship was established through a gift from Elizabeth King, Class of 1934. The scholarship award will be made to students with demonstrated need and without other restriction.

The Arthur D. Kinney Scholarship was established by Arthur D. Kinney Jr., Class of 1956. Preference for the scholarship award shall be given to students who are scholar-athletes with demonstrated financial need.

The Obadiah W. Kitchell Scholarship was established by a bequest from Obadiah W. Kitchell, an honorary degree recipient in 1899, with preference given to graduates of the East Orange High School, N.J.

The Grace & Stanley Kitzinger Scholarship was established in 2000 by Grace Livengood Kitzinger ’49. The scholarship shall be awarded to full-time sophomore, junior or senior students of high scholastic merit with demonstrated financial need, with preference for students majoring in biology. The student recipients should be United States citizens.

The Klaber Family Scholarship was established by Richard D. '55 and Judith Beattie '55 Klaber and their children, Bethany K. Succop ’80, R. Douglass Klaber Jr. ’86 and Andrew B. Klaber ’87; and grandchildren Samuel R. Klaber '18 and Sophia F. Klaber '20. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Richard A. Klein Scholarship was established in 2000 by Richard A. Klein, Class of 1969. The scholarship shall be awarded to students with demonstrated financial need, with preference for those who have elected a major or minor in theatre or dance, or who are active participants in the University’s theatre programs, and without other restriction.

The Kleinert Family Scholarship was funded by a gift from Robert A. and Christine L. Kleinert, dedicated parents of Sophie J. Kleinert, Class of 2014. Awards shall be made to students based on financial need, with preference given to female student-athletes in good academic standing who possess leadership skills.

The Kleinert-Wagner Scholarship was established by Richard and Susan Kleinert, Classes of 1974 and 1975, in honor of their parents, Frederick and Donna Wagner, and Robert and Jane Kleinert. It is the donors’ preference that the scholarship award be made to Christian students of music or electrical engineering.

The Marie R. Kline Memorial Scholarship was established by Raymond D. Kline, Class of 1919, to honor the memory of his wife. Preference for the scholarship award will be given to students from the Lewisburg area.

The Klock Family Scholarship was established by Lawrence S. Klock, Class of 1969, and his wife, Cheri Klock, in honor of his parents, Grace and Charles Klock. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Donald Bragg Knight Memorial Scholarship was created by a gift from Anita Spielberger Knight, Class of 1964, in loving memory of her husband Don, Class of 1963. The scholarship was created in memory of Don’s commitment to studying science and wrestling at Bucknell. Grants shall be made to students based on financial need, with preference given to students in the College of Arts & Sciences.

The Koandah Scholarship was established by James M. Sanborn and Emilie Sherman Sanborn, Class of 1955, in honor and memory of Sholl and Sherman family members who have attended Bucknell University. The scholarship shall be awarded in compliance with the University’s policy of nondiscrimination to qualified students who could not otherwise afford an education at Bucknell University, and who would, as Bucknell students, add to the economic, ethnic, racial, cultural and national diversity of the University.

The Kohn Family Scholarship was established in 2011 by Mr. Steven A. Kohn, Class of 1981, and his wife, Yvette V. Kohn, in recognition of Mr. Kohn's appreciation for his Bucknell experience and out of the desire for others to realize a similar benefit. The scholarship shall be awarded to students with demonstrated financial need.

The Helen Morton Koons Scholarship was established in 2000 by her daughter, Helen E. Koons, Class of 1971. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The John Arthur Koons, Class of 1900, Memorial Fund was established by a bequest of Josephine Bonham Koons, the income to be used to aid residents of Pennsylvania.

The Samuel J. Koons Scholarship was established by his daughter Helen E. Koons, Class of 1971, and his wife Helen Morton Koons, Class of 1925. Preference for the scholarship award shall be given to science or engineering student residents of Pennsylvania.

The Kress & Warg Endowment was established by a legacy of Clara L. Warg to endow scholarships in memory of Jack Culberson Kress and Clara L. Warg, for the education of needy young men.

The Paul Kreutzpointer Scholarship was established by Mrs. Annie Kreutzpointer in memory of her husband.

The Clarence M. & Henrietta H. Kriner Memorial Scholarship was established by their daughter, Sara Kriner Goodman, Class of 1950, in memory of her parents, Clarence M. and Henrietta H. Kriner, Class of 1917. Preference for the scholarship award will be given to students in the College of Engineering.

The Daniel G. Krise Scholarship was established by Daniel H. Krise, Class of 1899, for a student preparing to teach in the public schools of Pennsylvania.

The Johanna Kunkel Memorial Scholarship was established by Florence Hohnbaum Harvey, Class of 1939, to honor the memory of her aunt who made possible her education at Bucknell.

The Jeffrey L. Kwall '77 Scholarship was funded by a gift from Jeffrey L. Kwall, Class of 1977. Awards shall be made to students in the College of Arts & Sciences based on financial need.

The Lafond Family Scholarship was created by gifts from members of the Lafond Family. Grants shall be made to students in the College of Arts & Sciences based on financial need and without further restriction.

The Kenneth G. Langone Scholarship was established at the 20th anniversary of Mr. Langone's company, Invemed Associates, by Walter W. Buckley Jr. to honor and recognize the many contributions of Mr. Langone. Preference for the scholarship award shall be given to students who have evidenced high integrity, loyalty and steadfast determination in their daily lives.

The Langone Walling Scholarship was established in 2014 by Kenneth and Elaine Langone in memory and honor of lifelong friends Fitz Roy and Mary Jane Walling. Fitz received his bachelor of arts in education in 1946, was a veteran of World War II, and served as the director of admissions for more than 20 years. Preference for the scholarship award shall be given to students who have evidenced high integrity, loyalty and steadfast determination or overcoming adversity in their daily lives.

The LaPoint Family Scholarship was created by gifts from Kathy and Bill LaPoint, dedicated parents of Bridget LaPoint, Class of 2014, and Amelia LaPoint, Class of 2017. Grants shall be made to students based on financial need, with preference given to first-generation college students.

The Katherine B. Larison Scholarships were established by Katherine B. Larison, of the Institute Class of 1867, and were supplemented by the General Alumnae Association of the University. They are for women of exemplary character.

The Ruth S. & Frederick E. Lark Scholarship was established in 2007 by their daughter, Dr. Carol Lark '69. The scholarship shall be awarded to students who attended three or more years at Shamokin Area High School or its successor, and are graduates of Shamokin Area High School or its successor.

The Mabel Irwin Lavers Scholarship was established in 2001 by a bequest from Theodore H. Lavers, Class of 1929, to honor the memory of his wife, a graduate of the Class of 1930. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Lawlor Family Scholarship was originally established as the Doris Tucker Memorial Scholarship by Stuart Tucker and Scott Lawlor '86, to honor the memory of a wife and mother. In 2006, the scholarship was renamed and additional contributions were received from Scott Lawlor '86 and his wife, Elena Lawlor. The scholarship award was redirected to students with demonstrated financial need whose life experiences contribute to the cultural and ethnic climate of the campus, including first-generation college students, students from outside the University's traditional geographic area, and those who bring cultural and ethnic diversity to the campus.

The Richard '65 & Constance '66 Layman Scholarship was funded by a gift from Richard '65 and Constance '66 Layman. Awards shall be made to students based on financial need, without further restriction.

The Leadership First Scholarship was established by Joseph A. Ciffolillo, Class of 1961, and Joseph N. Ciffolillo, Class of 1984. The award recognizes the importance of leadership by providing scholarship aid to undergraduates. The Leadership First Scholarship is awarded to students whose activities and contributions to the community have distinguished them as leaders among their peers. Priority for new awards will be given to entering freshmen, without consideration of academic ranking. This award is renewable for each of four years of undergraduate study at Bucknell.

The Charles J., Filomena & Dr. Charles J. Leagus Jr. '53 Memorial Scholarship was established under an agreement completed in 2004 and funded by Dolores Leagus Clark, M.A. 1953, to preserve and honor the memory of her parents and brother. The scholarship shall be awarded to students without restriction.

The Susan A. Lechleiter Scholarship was created with gifts from Jeff '84 and Mark Wade in memory of Jeff's mother, whose lifelong love of music inspired others, especially her children. Grants shall be made to students in the College of Arts & Sciences based on financial need and without further restriction.

The Ledgerwood Family Scholarship was established in 2007 by William C. Ledgerwood '74 and D. Leanne Trout Ledgerwood '74 in honor of family members who are also Bucknell graduates. The scholarship shall be awarded to students with demonstrated financial need. The scholarship award shall be made without restriction.

The Dr. Leiser Foundation Scholarship, established by a bequest from Dr. William Leiser III, Class of 1909, recognizes the medical services provided for the citizens of Lewisburg by three generations of the Leiser family, including the donor; his father, Dr. William Leiser Jr.; and his grandfather, Dr. William Leiser.

The William Forrest Lenker Scholarship was established by members of the Kappa Sigma fraternity to honor William Forrest Lenker, Class of 1956, on the occasion of the centennial celebration of the Alpha Chi chapter of the Kappa Sigma fraternity. The scholarship award shall be given to students with demonstrated financial need, with preference for members of the Kappa Sigma fraternity who have demonstrated exceptional scholarship, leadership and service to Bucknell and the community.

The Edward Leptinsky Scholarship was established in 2011 by Michael J. Costa, Class of 1991, and his wife, Laureen R. Costa, Class of 1990, with funding from the Houston Endowment to honor Mr. Leptinsky, who was first in his family to attend college and appreciated the importance of access to educational opportunities. The scholarship shall be awarded to students with demonstrated financial need, with preference for students from Serra Catholic High School in McKeesport, Pa., or Allegheny County, Pa.

The Nile R. Lestrange, MD Scholarship was created by gifts in loving memory of Nile by his wife, Bette S. Lestrange, and daughter, Laurel Liane Lestrange. A member of Bucknell's Class of 1958 with degrees in biology and chemistry, Dr. Lestrange was a prominent physician who frequently lectured at colleges and universities. He deeply valued education as a means of creating opportunities for success. Grants shall be made to students based on financial need, with preference given to students in the College of Arts & Sciences.

The Ira A. Levin Scholarship was established by Ira A. Levin, Class of 1952, in memory of his parents. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Rosetta Miller Lewis Scholarships were established by a bequest from Rosetta Miller Lewis.

The Warren "Bud" Lewis Scholarship was established by his wife, Gladys Rowland Lewis, children and friends to preserve his memory. The scholarship award will be made without restriction.

The Peggy & Bob Ley Scholarship was established by Margaret Hollinshead Ley, Class of 1960, and her husband, Robert Ley. The scholarship shall be awarded to students with demonstrated financial need, with first preference given to students who have been historically underrepresented at Bucknell University.

The Diana Rudge Limongelli '89 Scholarship was funded by a gift from the Rudge Family Foundation in honor of Diana Rudge Limongelli, Class of 1989. Awards shall be made to students based on financial need, without restriction.

The William L. Litchfield Scholarship was established by Marcia Litchfield Martell, Class of 1973, and Sharon Litchfield Spencer, Class of 1975, in memory of their father, William L. Litchfield, Class of 1928. Preference for the scholarship award shall be given to student-athletes.

The Leslie & Gary Little Family Scholarship was created by gifts from Leslie and Gary Little, dedicated parents of Scott Little, Class of 2021. Grants shall be made to students based on financial need, with preference for students in the College of Engineering.

The Margaret B. Livingston Scholarships, established by a bequest from Margaret B. Livingston, are for pre-ministerial students recommended by the Department of Religion.

The Mildred Rose Lloyd Memorial Scholarship was established in 2011 by Ellen Q. Bush, Class of 1979, and her daughter Millie Lloyd. The scholarship remembers Mildred's kindness, warmth and caring to Ellen and Millie, and to everyone in her community, as well as her affection for Bucknell and Bucknell's scholarship students. The scholarship shall be awarded to students with demonstrated financial need, who by their presence help create a student body that is representative of the diversity of the world outside Bucknell.

The Dr. Richard A. Lobban Jr. Study Abroad Scholarship was created by gifts from Dr. Richard A. Lobban Jr., Class of 1966. Grants shall be made based on financial need to students who participate in study abroad programs, with preference for programs in Africa.

The Marguerite D. Lofft Memorial Scholarship was established by Henry T. Lofft, Class of 1917, in memory of his wife. In awarding the scholarship, preference will be given to worthy civil engineering students.

The Esther B. Long Memorial Scholarship was established to honor the memory of Esther B. Long, Class of 1947, by her son, Morris A. "Andy" Long, Class of 1949, and her daughter-in-law, Helena J. Long. In recognition of Esther Long's lifetime of service as director of Bucknell's dining service, the scholarship shall be awarded to students with demonstrated financial need, with preference for students who are employed by the University's dining service or who are geology majors.

The O.W. Longan Scholarship was established by a bequest of O.W. Longan, Esq., for a student who plans to enter the ministry and who lives in Lycoming County, Pa.

The Shaw Loo Memorial Scholarship was established in 1998 to commemorate the 140th anniversary of Shaw Loo's arrival on campus from Burma as Bucknell's first international student. The scholarship also marks the historic ties of Bucknell to the nation and people of Burma extending to the University's founding in 1846.

The K. Allen & Mary Lovell Music Scholarship was established for a deserving woman student studying piano and with a wholesome interest in her fellow students; the student is to repay the scholarship to the fund.

The Horace A. & Antoinette M. Lowe Scholarship was established through a bequest from Horace A. Lowe Jr., Class of 1940, and his wife, Antoinette. The scholarship award shall be made without restriction.

The Alma Lowry Scholarship Fund was established by the bequest of Alma Lowry Williams and is named for her and for her maternal grandmother, Alma Lowry, whose cousin, Stephen W. Taylor, wrote the Charter of the University and served as acting president. Income from the fund is to be awarded to students in the fields of religion, medicine, teaching, humanities and the fine arts, especially music. No part of the fund may be used for athletic activities or promotion.

The W. Norwood Lowry Scholarship was established by a gift from Robert Lowry Stanton, Class of 1940. Preference for the scholarship award will be given to worthy students majoring in physics or mathematics.

The Francis X. Lucarelli Scholarship was established in memory of this distinguished member of the Class of 1962 by members of the Lucarelli family for the purpose of providing financial assistance to worthy and needy students.

The Lewis Frederick Lyne Jr. Mechanical Engineering Scholarship was established by a bequest of Lewis Frederick Lyne Jr., Class of 1914, the income to be available to men who are students in mechanical engineering and who are also members of the Sigma Chi fraternity.

The Jane Brown Maas Scholarship was funded by a gift from former Trustee Jane Brown Maas, Class of 1953. Grants shall be made to students based on financial need, with preference given to students majoring in English.

The Macaulay Family Scholarship was created by gifts from Douglas '68, Kim, Cameron and Shannon Macaulay. Grants shall be made to students based on financial need and without further restriction.

The Betty Ann Waddington Mackey Scholarship was established by Betty Ann Waddington Mackey, Class of 1948, and her husband, Howard D. Mackey. The scholarship is established in Betty Ann's honor and in gratitude for what Bucknell University has meant in her life. The scholarship is to be awarded to students with demonstrated financial need, with preference given to students majoring in psychology.

The Neil Thompson & Gary MacNew Scholarship was established in 2000 by Gary A. MacNew, Class of 1976. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who are citizens of Canada, or who are seeking a Bachelor of Science in Business Administration, and who have demonstrated support to the community through volunteer work in serving the poor, sick, disabled or needy.

The Sarah Slaughenhaup Madison '41 Scholarship was funded by a gift from Linda Madison Kirk in 2012. Awards shall be made to students based on financial need without restriction. The scholarship serves as a memorial honoring Linda's mother, Sarah Slaughenhaup Madison, Class of 1941. Sally was an incredible lady who was widowed at age 36, raised two small children by herself, ran a successful business and traveled the world. For Linda, Sally was her mother, father and very best friend. Sally will be remembered by those who will follow in her footsteps.

The Malesardi Scholarship was established by gifts of the Malesardi Foundation and Robert E. Malesardi, Class of 1947, the income to be used to aid students with demonstrated need. Preference is to be given to qualified candidates from Elk County, Pa.

The Joseph Earl Malin Scholarship was established by a bequest of Dolly Frey Malin in memory of her husband, Joseph Earl Malin, Ph.D., Class of 1916. It is to be awarded to worthy young men who are majoring in chemistry.

The Malone Family Scholarship was established by J. Gilbert Malone, Class of 1927, in memory of his mother, Mary Ruff Malone, and his wife, Mary Gerlash Malone. The scholarship award shall be made without restriction.

The E.R. & E.M. Manchester Scholarship was established through a bequest from Elizabeth M. Manchester, Class of 1935. The scholarship award shall be made without restriction to students who demonstrate financial need.

The Colin Donohue Marren Scholarship was established in loving memory of Colin Marren, Class of 2010, by his family, classmates and friends. Colin had a passion for living life to its fullest and he truly appreciated the opportunity to be a Bucknellian. The scholarship will be awarded to a student with demonstrated financial need, with preference for a student from Westchester County, N.Y., or Fairfield County, Conn., a commitment to community service and without further restriction.

The Cynthia Luks Martin '54 Scholarship was created by a gift from Cynthia Luks Martin, Class of 1954, and her husband, Harry Martin. Grants shall be made to students based on financial need and without further restriction.

The Henry A. & Kathryn E. Martin Scholarship was established in 2007 through a bequest from Henry A. Martin, Class of 1939. The scholarship shall be awarded to students with demonstrated financial need, with preference for students from Hazleton Area School District, Luzerne County, Pa.

The Arnaud C. Marts Scholarship Fund was established by contributions from students, faculty, administration, family and friends as an expression of appreciation of President Marts' service to the University. The income is to be used as a scholarship for deserving students.

The Franklin Mathews Service Scholarships were established for male students by Franklin Mathews, Class of 1868.

The Christy Mathewson Student Athlete Scholarship was created by a gift from Donald Isken '75, P'12 '20 to support merit aid for a member of the women's or men's lacrosse team who demonstrates the ideals of the scholar-athlete as exemplified by the University's most celebrated student athlete for whom this scholarship is named.

The Christy & Jane S. Mathewson Scholarship was established by Jane S. Mathewson and it is to be awarded to a student who is in financial need; who possesses special ability in mathematics; who has shown integrity and dependability; and who has participated in the school's activities, especially in athletics.

The Margaret Blair Mathias Memorial Scholarship was originally established in 1997 as the Janet B. Mathias Scholarship by Janet B. Mathias, Class of 1966. This scholarship has been awarded to students with demonstrated financial need who major in or have an established record of participation in music, art or theatre, with first preference given to students majoring in music performance. In 2010, Ms. Mathias renamed the scholarship in honor of her mother, Margaret Blair Mathias, Class of 1936, who passed away in 2005, and expanded the award to include students majoring in English who demonstrate financial need, exceptional writing skills and a thorough knowledge of English grammar.

The John H. & Susan B. Mathias Scholarship was established by John H. '69 and Susan B. Mathias '69 and honors the extensive ties of the Mathias family to Bucknell University. Preference for the scholarship award shall be given to students whose ethnic, racial, economic or national origins add to the diversity of Bucknell.

The J.P. Mathias Scholarship was established by Margaret Blair Mathias, Class of 1936, to honor the memory of her husband, J.P. Mathias, Class of 1935. Preference for awards from this scholarship shall be given to varsity student-athletes, with demonstrated financial need, selected by the director of athletics and the coaches.

The Andrew Wray Mathieson Scholarship, named for Mr. Mathieson, a member of the Bucknell Board of Trustees and the Class of 1950, was established by his children, Margaret A., Class of 1977, and Andrew F. and Peter F., Class of 1983, to honor his many contributions to and deep devotion for the University, and in honor of his father, Andrew R. Mathieson, Class of 1920. Preference for the scholarship award will be given to residents of Allegheny County or other southwestern Pennsylvania communities.

The Peter D. Mauritz '81 Memorial Scholarship was created by Peter's children with support from family and friends, to assist in honoring his legacy and preserving his memory following his unexpected passing. Peter, a 1981 graduate of Bucknell's College of Engineering and former defensive tackle on the Bison football team, is remembered as an exemplary student, a great teammate and a true embodiment of the term scholar-athlete. Peter credited his time at Bucknell for the professional successes he achieved later in life in the field of civil engineering. Grants shall be made to students based on financial need, with preference for students in the College of Engineering.

The Barry R. & Marjorie A. Maxwell Scholarship was established in 1998 to express the respect and affection of friends and associates of the Maxwells on the occasion of Barry Maxwell's retirement as vice president for administration at Bucknell University. The scholarship shall be awarded to students with demonstrated financial need, with preference for students in engineering and without other restriction.

The McAleer Family Scholarship was created by gifts from Robert C. McAleer, Class of 1994, and Dana (McAleer) Guild, Class of 1991. Grants shall be made to students based on financial need and without further restriction.

The Susan & Bruce McAllister Endowed Scholarship was created to honor two native New Yorkers who came to love Bucknell through the eyes of their son, David F. Marr III '83. Grants shall be made to students based on financial need, with preference given to students from New York City.

The Leila Preston McCain Scholarship was established by a gift from Donald R. McCain, Class of 1905, to be awarded annually to a woman who is a member of the senior class, who is of high moral character and whose scholastic record is superior.

The John Lehy McCarthy Memorial Fund was established by a bequest of Elizabeth B. McCarthy, Class of 1917, in memory of her son, the income to be used to aid any worthy students in need.

The McClelland Hill Family Scholarship was created by gifts from Whitney McClelland Hill and Brian Hill, both Class of 1998. Grants shall be made to students in the College of Engineering based on financial need and without further restriction.

The Robert L. McClintock Scholarship was created by gifts from the estate of Robert McClintock, Class of 1948. Grants shall be made to students based on financial need and without further restriction.

The Marti L. McCord Scholarship was established in memory of Marti Lynn McCord, Class of 1963, who died shortly after graduation. The scholarship award shall be made without restriction.

The Shirley Jane McCreary Scholarship was established by Ralph W. McCreary in memory of his daughter, a member of the Class of 1952. The awarding of this scholarship is based primarily on need and preference is given to students planning a career in nursing or medicine.

The Frank & Edna Keen McCrina Memorial Scholarship was established through a bequest from Mary McCrina Miller, Class of 1940, in memory of her parents. Preference for the scholarship will be given to students majoring in the humanities.

The Gilbert G. McCune Leadership Award was established by Mr. McCune, Class of 1927. The award recognizes the importance of extracurricular achievement through scholarship aid to seniors who have brought honor to the University by their activities outside the classroom.

The William D. McFarlan Jr. Scholarship was established by a legacy of William D. McFarlan Jr.

The George V. McGee Investment Studies Endowment was established in 2002 by The Charles Foundation Inc., a Rooke Family Private Foundation, to honor George V. McGee, Class of 1938, a friend of Robert C. Rooke. The endowment provides merit-based grants to students who demonstrate potential as future professionals engaged in the fields of finance and investment. Students selected as McGee Scholars must hold a record of superior academic achievement, contributions to the University community, and successful participation in finance or investment-related internships, employment or other activities.

The Mark Ryan McGinly Memorial Scholarship was established in 2007 in memory of Mark R. McGinly, who lost his life on September 11, 2001, in the New York City World Trade Center. The scholarship was launched by the Mark Ryan McGinly Memorial Scholarship Fund in Vienna, Va., the McGinly family, and Mark's many friends to commemorate the 10-year anniversary of the Class of 1997. Mark was a very proud Bucknell graduate and made many wonderful friends, fond acquaintances and valued business associates as a result of his Bucknell University experience. Preference for the scholarship shall be given to deserving undergraduate students with demonstrated financial need who are majoring in management.

The Richard G. McGinnis International Engineering Study Scholarship was established in 2006 by Debra Anderson Apruzzese '80 and John J. Apruzzese '80, and Louis and Angelika Anderson, to honor Professor McGinnis, who successfully pursued his vision to expand the Bucknell engineering experience to include international study. The scholarship provides assistance for Bucknell engineering students to travel and study outside the United States. Awards shall be made to full-time students who demonstrate that their international study program is a valuable addition to their on-campus experience, and who have demonstrated financial need.

The Richard G. McGinnis Memorial Scholarship was funded by a gift from anonymous donors. Awards shall be made to students in the College of Engineering based on financial need, without restriction. The scholarship was established in memory of Dr. Richard G. McGinnis, Bucknell professor of civil and environmental engineering from 1970 to 2011.

The McKenna Family Scholarship was created by gifts from James M. and Dale C. McKenna, P'00, P'04, members of the Parents Board from 1997-2004; Erin J. (McKenna) Evanoka '00; and Megan C. McKenna '04. Grants shall be made to students in the College of Management based on financial need and without further restriction.

The Alex G. McKenna Scholarship was established in memory of Mr. McKenna by his children, Linda McKenna Boxx, Class of 1974, and David E. McKenna, Class of 1973. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Newman Frederick McKinney-Jennie Owens McKinney Memorial Scholarship Fund was established by Newman F. McKinney, Class of 1928, and his wife, Jennie Owens McKinney, Class of 1930, to provide scholarships: in civil engineering, in honor of Newman Frederick McKinney and William McKinney; in history, in honor of Jennie Owens McKinney; in pre-medicine, in honor of Charles Owens; in English, in honor of Anna Maude Lobaugh Owens; in education, in honor of Blanche Newman McKinney; and in psychology, in honor of Thomas Gilespie McKinney.

The Scott Thomas McMahon Scholarship was funded by a gift from the estate of Margaret McMahon-Hickey, a member of Bucknell's Class of 1962. Grants from the scholarship are awarded preferentially to students with demonstrated financial need and without other restriction. The scholarship serves as a memorial honoring Scott Thomas McMahon.

The William D. & Dorothy O. McRae Scholarship Fund was established in 1979 by chapel choir alumni and friends, the income to be awarded to a worthy vocalist, organist or other musician, with preference for a member of the chapel choir as recommended by the director of the chapel choir and the department chair of music.

The Alfred Lloyd & Elizabeth Beidler Meckley Scholarship was created with gifts from the estate of Alfred Lloyd Meckley, Class of 1950. Grants shall be made to students in the School of Management based on financial need, with preference for students from central Pennsylvania.

The Meerwarth Scholarship was established by a gift from Lurenna M. Meerwarth and her daughter, Tracy L. Meerwarth, Class of 1996. Preference for the scholarship award shall be given to students majoring in biology who are United States citizens.

The Clifford C. & Elizabeth Melberger Scholarship was established in 2005 by Clifford K. "Mickey" Melberger, Class of 1961, and his wife, Ruth B. Melberger, in memory of his parents and to honor their commitment to education. The scholarship shall be awarded to students with demonstrated financial need.

The Melior Scholarship was established in 2010 by Charles M. Boldt, Class of 1972. The scholarship's name was derived from the word ameliorate, meaning "to make better." The scholarship shall provide assistance to a student enrolled in the College of Engineering with a demonstrated financial need, thereby providing an improvement in the student's financial situation that benefits both the student and Bucknell.

The Herbert L. Merin Scholarship was established in 1998 by Andrew J. Merin, Class of 1970, to honor his father. Although Herbert Merin never attended college, he had a reverence for education. The scholarship was created to reflect the gratitude of his son for granting him the opportunity to

attend Bucknell and to follow his father's instructions to always pay back those institutions that have helped him along the way. The scholarship shall be awarded to students who are judged to have the most pressing demonstrated financial need and without other restriction.

The Rita L. Merin Scholarship was funded by gifts from Andrew J. Merin, Class of 1970, in honor of his mother, who made it possible for her son and two grandchildren (David F. Merin, Class of 2006, and Natalie P. Merin, Class of 2014) to attend and graduate from Bucknell. Awards shall be made to one or two students judged to have the most pressing demonstrated financial need, without further restriction.

The Sara Chandler Merrick Scholarship was established in memory of their daughter by Grace Milhous Merrick, Class of 1927, and J. Leon Merrick, the income from which is to be used to provide financial aid for a deserving undergraduate selected by the University in accordance with established scholarship policies. Preference shall be given to students from southeastern Pennsylvania, especially those from the Kennett Square area.

The Richard Miles & Jane Dawson Miles Memorial Scholarship was established by a bequest from the estate of Betty Miles James, Class of 1944, in memory of her parents, the income to be used for a student of truly modest means who otherwise could not have attended Bucknell University.

The Florence Beckworth Miller '27 Memorial Scholarship was established in 2002 by her sister, Evelyn M. Beckworth, Class of 1930, to honor Florence's outstanding academic performance in her pre-med studies. The scholarship shall be awarded to students with demonstrated financial need, with preference given to students planning to pursue a career in medicine who are also United States citizens.

The Lois Cullen Miller '54 Chemistry Scholarship was established in 2005 by Eugene Miller. The scholarship shall be awarded to students with demonstrated financial need, with preference for upper-class students who are majoring in chemistry.

The Robert G. Miller Math, Science & Engineering Scholarship was established in 2011 by Rosemary H. Miller and honors her late husband, Robert G. Miller, Class of 1937, and his descendants. The scholarship shall be awarded to citizens of the United States of America and with preference for students who are majoring in or intend to major in mathematics, any of the laboratory sciences or any engineering discipline.

The Miller Family Engineering Scholarship was established through a bequest from John W. Miller, Class of 1943, as a tribute to his brothers, Clyde L. Miller, Class of 1931, and C. Guy Miller, Class of 1935. Preference for the scholarship award shall be given to students with demonstrated financial need in the College of Engineering.

The Mills Family Scholarship was established in 2009 by Bucknell trustee Craig Mills, Class of 1976, and his daughter, Chelsea Mills, Class of 2006. The scholarship shall be awarded to students with demonstrated financial need who are enrolled in the College of Arts & Sciences.

The Jacob H. Minick Fund was established by a bequest from Jacob H. Minick, Class of 1891, the income of which is to be given each year to students who, because of some physical difficulty, are forced to use crutches during all of their college work.

The Moll-LaBar Family Scholarship was established by Bruce A., Class of 1954, and Marion Moll LaBar, Class of 1956. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Michael W. Moohr Memorial Scholarship was funded by gifts from members of the Bucknell University community. Awards shall be made to students based on financial need, without restriction. The Michael W. Moohr Memorial Scholarship serves as a lasting tribute to Michael W. Moohr, an associate professor of economics who taught at Bucknell for 35 years. He joined the faculty in 1975, served as chair of the economics department from 1990 to 1994, and received the Lindback Award for Distinguished Teaching in 1983. As an academic adviser, Michael helped hundreds of students through his wide range of interests and expertise, including the economics of art and architecture. He was a faculty adviser to the Pi Beta Phi sorority, the Real Estate Club, which he was instrumental in founding, and was a co-director of the Bucknell in Barbados Program.

The Frederick C. Moor Jr. Scholarship was established by Stanley G. Williams, Class of 1943, and his wife, Doris, in memory of F.C. "Doc" Moor, aviation pioneer and powerboat racing champion. The scholarship award will be made without restriction.

The James Moore III Scholarship was established for descendants of the family.

The Dorothy H. & Peter F. Morgantini Scholarship was established by Dorothy Harris Morgantini and Peter F. Morgantini, both members of the Class of 1987. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Edmond N. & Virginia H. Moriarty Scholarship was established by Virginia Moriarty and Edmond Moriarty, trustee. The scholarship shall be awarded to returning students with demonstrated financial need, with preference for students who need assistance due to sudden financial loss, such as parental unemployment, disability or the death of a family member, or other causes, and without other restriction.

The Morrell Family Scholarship was established by James J. and Karen Olsson Morrell, both members of the Class of 1974, to honor the Rev. James D. Hammerlee, who served Bucknell for 26 years and was a friend and mentor to both. Preference for the scholarship award shall be given to students with demonstrated financial need and without other restriction.

The Ann M. Morrison Scholarship was established by Ann M. Morrison, Class of 1970, and Steven J. Pitchersky. The scholarship award shall be made without restriction.

The Carl M. & Kathryn W. Moyer Scholarship was established by Kathryn W. and Carl M. (M.S. 1969) Moyer. The income earned by the scholarship is to be used to provide emergency assistance to students who have experienced sudden financial loss through the death of a family member or for other causes, and who could not continue their education without such scholarship aid.

The Earle L. & Christine Sterner Moyer Memorial Scholarship was established by Christine Sterner Moyer, Class of 1928, and enhanced by additional contributions from her son, William S. Moyer, Class of 1957, and daughter-in-law, Joan F. Moyer. Preference for the scholarship award shall be given to needy and deserving students.

The Mt. Pleasant Institute Scholarships Fund was established through the merger of the Western Pennsylvania Classical and Scientific Institute at Mt. Pleasant with Bucknell University as a memorial of long and faithful service to the Mt. Pleasant Institute by Leroy Stephens, A.M., D.D., Class of 1868, a Bucknell trustee for 40 years. The fund provides an endowment for awarding undergraduate scholarships to students of ability and character who are worthy of financial assistance, preference being given to Baptist students or to students of Baptist antecedents, living in western Pennsylvania. As a result of the merger in 1936, the following endowed scholarships were established:

- **The Nathaniel S. Houseman Scholarship**
- **The Nelson Weddle Jr. Scholarship**
- **The Sarah Ann Trevor Scholarship**
- **The Leroy Stephens Scholarship**

The Mullins Family Scholarship was established in 2008 by Dr. Kevin J. Mullins, Class of 1987, and his wife, Stacey Gardner Mullins, Class of 1988. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in neuroscience.

The Thomas Joseph Murray Memorial Scholarship was created in 2011 with gifts from his family and friends. Tom, a football player and management major, remained a loyal supporter of varsity athletics following his years at Bucknell. Grants shall be made to varsity student-athletes in the Freeman College of Management, with preference given to varsity football players.

The Malcolm E. Musser Scholarship was established by gifts of the Robert L. Cooley family and is to be awarded to a student who is an outstanding golfer.

The Geoffrey P. & Barbara F. Mynott Scholarship was established by Geoffrey P. and Barbara Folk Mynott ’54/’56. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Eleanor Nachshin Scholarship was established by Robert J. Nachshin, Class of 1972, and his wife, Monica Lipkin. The recipient shall be selected in the following order of preference: 1) juvenile (Type I) diabetes; 2) other form(s) of diabetes; 3) sight impairment so as to be unable to read; 4) kidney transplant or renal dialysis; 5) diseases or disabilities similar to those caused by juvenile diabetes.

The Ross J. Nahrgang Scholarship was established by Mrs. Anne Horoschak Nahrgang, B.S., M.D., Class of 1923, as a memorial to her son, the income to be used to aid one or more women students, preferably in the pre-medical program.

The Zeina Nassif-Goldman Sachs Scholarship was created from gifts made by Zeina Nassif, Class of 1996, and Nick Advani. Grants shall be made to students based on financial need and without further restriction.

The Richard Nathan Scholarship was established through a bequest from Richard Nathan, Class of 1939. The scholarship award will be made without restriction.

The Neely Ainslie Family Scholarship was created by gifts from Carolyn (Neely) Ainslie and Timothy Ainslie, both Class of 1980. Grants shall be made to students based on financial need, without further restriction.

The Peggy Apgar Neuville ’61 Memorial Scholarship was established in 1996 by Stephen B. Neuville, Class of 1957. Preference for awards from the scholarship will be given to students residing in the southeastern United States; awards will be made without other restriction.

The Newcomb Family Scholarship was established by William Y. Newcomb, Class of 1936; his wife, Mary VanKirk Newcomb, Class of 1934; and their sons, William A. Newcomb, Class of 1965, and L. Kirk Newcomb, Class of 1968. The scholarship award shall be made without restriction.

The Chris (Horne) '57 and Dick Newman '56 and Family Scholarship was created by gifts from Chris (Horne) Newman, Class of 1957, and Dick Newman, Class of 1956, and their family. Grants shall be made to students based on financial need, with preference given to high-achieving students.

The Nichols Family Scholarship was established in 2003 by Scott Nichols, Class of 1970, and his wife, Muriel Nichols. Preference for the scholarship shall be given to students majoring in music. Grants from the scholarship will be used to assist in attracting the strongest possible talented students.

The Nicolia Family Scholarship was created by gifts from Sandy and Christina Nicolia, members of the Parents Association Board of Directors, in honor of their children, Grace A. Nicolia, Class of 2017, and Sara T. Nicolia, Class of 2020. Grants shall be made to students based on financial need and without further restriction.

The S. Yvonne Novak Scholarship was established by Darryl L. Novak, Class of 1963; Sigrid Christensen Novak, Class of 1964; and Lars, Margo and Yvonne Novak. The scholarship award shall be given to students with demonstrated financial need, with preference given to young adults with insulin-dependent Type 1 diabetes.

The Sigrid Christensen Novak Scholarship was created in 2016 in memory of Sigrid Novak, Class of 1964, with gifts from her husband, Darryl '63, their children, Lars, Marguerite and Yvonne, other family members and friends. Sigrid was a passionate Bucknellian with a love of the campus, students, faculty and staff. She was active in the Bucknell community as editor of *The Bucknellian*, and she later became a social worker who remained involved in community service throughout her life. Grants shall be made to students based on financial need, with preference given to students majoring in sociology & anthropology or English.

The Professor Sally Nyquist Memorial Scholarship was created by a gift from an anonymous donor in memory of Dr. Nyquist, who taught biology and microanatomy at Bucknell from 1972 to 2004. During her successful tenure, Dr. Nyquist served as chair of the biology department and chair of the Program in Cell Biology & Biochemistry from its inception in 1989 until her retirement. She was a dedicated student advocate and teacher/scholar who received the Bucknell Presidential Award for Teaching Excellence in 2002. Grants shall be made to students based on financial need and without further restriction.

The Jay A. Oberdorf '47 Memorial Scholarship was created by gifts from Linda A. Jacobsen, Cheryl J. Oberdorf and Joyce A. Oberdorf in memory of their father, Jay Arthur Oberdorf, Class of 1947. The scholarship is in recognition of the profound impact Bucknell had on a young man from rural Pennsylvania, changing the path of his life and ultimately that of his family. Grants shall be made to students based on financial need, with preference to students majoring in mechanical engineering.

The Christopher & Elizabeth O'Brien Family Scholarship was funded by a gift from Trustee Christopher J. O'Brien '80 and his wife, Elizabeth O'Brien. Awards shall be made to students based on financial need, with preference given to junior-year students enrolled in the School of Management who are identified by faculty for their potential to succeed in their chosen field.

The Dennis & Judith O'Brien Scholarship was established by friends and colleagues in honor of Bucknell's 12th president and first lady, the income to be used to provide one or more scholarships for undergraduate students in the humanities.

The Merle M. & Frances B. Odgers Scholarship Fund was established by the Bucknell Parents Association and others in honor of the former president and Mrs. Odgers, the income to be used to provide one or more scholarships for undergraduate students.

The Margaret Tustin O'Harra Memorial Scholarship was established in 2006 as an endowed scholarship by action of the Board of Trustees out of a residuary bequest from the estate of Helen F. O'Harra. The scholarship is intended to honor the memory of Helen's mother-in-law, Margaret Tustin O'Harra, and shall be awarded to students without restriction.

The O'Keeffe & Young Family Scholarship was created by a gift from Peter R. O'Keeffe, Class of 1972, and Sandra Young. Grants shall be made to students based on financial need, with preference given to students participating in Bucknell's Los Angeles Posse Program.

The Stewart W. Oldt Memorial Scholarship was established in 2008 with a testamentary gift from Barbara Oldt to honor the memory of her father. Awards shall be made to a deserving student from the central Pennsylvania area who is enrolled in the College of Engineering, with preference for a student majoring in mechanical engineering.

The J. Orin Oliphant Scholarship was established by Edward G. Hartmann, Class of 1937, and other students and colleagues of Dr. Oliphant, the income to be used for a student majoring in the humanities, preferably in history.

The Oliver Family Scholarship was established in 2011 by Patricia Tarleton Oliver, Class of 1980, and her husband, Brian D. Oliver. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

The Olson Family Scholarship was created by gifts from Cheryl Woods Olson, Class of 1990, and her husband, David R. Olson. Grants shall be made to students based on financial need and without further restriction.

The Tim O'Mara Memorial Scholarship was established to honor the memory of Timothy J. O'Mara, Class of 1990, by Tim's parents, J. Joseph and Helen O'Mara, and his friends and lacrosse teammates. Awards shall be made to students based on financial need, with preference given to men's varsity lacrosse players.

The James G. Orbison Scholarship was established in 2009 by alumni and other admiring friends and colleagues to honor their esteemed friend, faculty member and dean, James G. Orbison, Class of 1975, on the occasion of his return to the faculty and retirement as dean of the College of Engineering, and the 35th anniversary of his graduation from Bucknell. This scholarship is a tribute to a teacher, scholar and administrator who served as mentor and instructor for Bucknell students, faculty and colleagues, and who as dean led the College of Engineering to national prominence as one of the top undergraduate engineering programs. Awards from this scholarship will be made to undergraduate students enrolled in the College of Engineering.

The Oristaglio Family Scholarship was established in 1999 by Stephen M. Oristaglio, Class of 1977. The scholarship shall be awarded to students with demonstrated financial need, with preference for varsity scholar-athletes who have an interest in the arts.

The Sally J. & R. Lyman Ott Scholarship was established by R. Lyman Ott Jr., Class of 1962; Sally J. Clute Ott, Class of 1964; Kathryn A. Ott, Class of 1991; and Curtis L. Ott. Preference for the scholarship award shall be given to students who are varsity soccer team members and who are majoring in the liberal arts.

The Esther Owens Scholarship was established by a gift of Miss Esther Owens.

The William G. Owens & Jeannette W. Owens Scholarship was established by William G. Owens, Class of 1880, to perpetuate the interest of his wife, Jeannette W. Owens. It is to aid students who have committed themselves to serve in foreign missions under the supervision of the Baptist Church, and is to be awarded to students who are of good character and who need financial aid. If the preference cannot be met, the award shall be made without restriction.

The William G. Owens Scholarship was established by his daughter, Jeannette Owens Burnet, Class of 1917, in memory of her father, Professor William G. Owens, Class of 1880, who taught the physical sciences at Bucknell for more than 50 years. It is to be used to help worthy students, with a preference given to those who are majoring in chemistry.

The Mario "Pops" Panicucci Scholarship was established by David, Class of 1991, and Eliza Dunn in honor of Dave's grandfather, a first-generation American who did not have the opportunity to pursue a formal education but would have loved it. Grants shall be made to students based on financial need and without further restriction.

The Parks Family Scholarship was established by Marilyn Olson Parks, Class of 1968, and her husband, Robert W. Parks, Class of 1966. The scholarship award shall be made without restriction.

The Judy Parsons Memorial Scholarship was established by the Bucknell Student Government with contributions from the family and friends of Judy Parsons, Class of 1988, to honor her memory. Preference for the scholarship award will be given to physically handicapped students.

The Pascucci Family Scholarship was established by Michael C. Pascucci, Class of 1958. Preference for the scholarship award shall be given to students with demonstrated financial need and without other restriction.

The James N. Patterson Scholarship was established by James Patterson, M.D., Class of 1924. The scholarship award will be made without restriction to support the Bucknell education of students with demonstrated financial need.

The Paulis Family Scholarship was established in 1993 by the family of Dara M. Paulis, Class of 1993; Bradley D. Paulis, Class of 1989; and his wife, Nancy Neu Paulis, Class of 1988; as an expression of their appreciation for the educational opportunity given to them at Bucknell and to the glory and honor of God, who made it possible. Preference for the scholarship award shall be given to a United States citizen who meets high academic standards, displays financial need and demonstrates community involvement.

The Paulison-Byerly Scholarship was established through a bequest from Barbara Paulison Byerly, Class of 1953. The scholarship award shall be made without restriction.

The Robert J. & Margaret M. Pavlin Memorial Scholarship was created by gifts from their daughter, Teresa Pavlin, Class of 1975, to honor their commitment to quality education. There were no limits to the financial and emotional support Mr. and Mrs. Pavlin gave their children. Grants shall be made to students based on financial need and without further restriction.

The Professor Catherine "Kay" Payn Scholarship was funded by a gift from Frank '80 and Gretta Lattal and their daughter Emily '12 as a testimony of the family's deep appreciation and affection for a teacher, mentor and friend who consistently builds in her students a skill set for academic curiosity, a discipline for effective learning and a lifelong passion for opera. Awards shall be made to students studying voice or music based on financial need, with preference given to students studying opera.

The William A. Payn Music Scholarship was created by a gift from Emeritus Trustee Robert C. Rooke and Natalie D. Rooke to honor Emeritus Professor of Music William A. Payn. The scholarship will strengthen Bucknell's music program by enhancing the University's ability to recruit and enroll vibrant music students who have demonstrated excellence in music. Awards shall be made to students based on their merit in music.

The Dr. Joseph & Elizabeth Pennino Memorial Scholarship Fund was established by a bequest of the late Elizabeth Pennino, the income of which provides a scholarship for a student enrolled in the civil engineering department.

The Richard J. Peterec Scholarship was established in 2008 by a group of loyal alumni to honor their beloved professor and by other admiring friends and colleagues. This scholarship is a tribute to an unforgettable teacher and scholar who inspired and mentored four decades of Bucknellians. In recognition of Professor Peterec’s challenge to his students to view themselves and others in a broader global context, the scholarship shall be awarded annually to students with demonstrated financial need majoring in geography or international relations.

The Rick '76 & Kim Peters Family Scholarship was established in 2007 by S. Brodrick Peters Jr. and Kim W. Peters. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Pettit Family Scholarship was established by Raymond F. Pettit, Class of 1953. The scholarship shall be awarded to students with demonstrated financial need, with preference for student-athletes.

The Joseph W. Peyser Scholarship Fund, established by a bequest from Joseph W. Peyser, the income to be used to aid worthy students who are graduates of the high school of the Shikellamy School District and who have been residents of Northumberland for at least three years prior to high school graduation.

The Philadelphia Alumnae Scholarship was founded by the Philadelphia Alumnae Club for a woman who lives in Philadelphia.

The Llewellyn Phillips Scholarship was established by a friend in memory of Professor Llewellyn Phillips, Class of 1892, for a student contemplating a life's work in a Christian vocation.

The Emil J. & Elva E. Polak Memorial Scholarship was established by gifts from friends, family, colleagues and former students of Emil J. Polak, professor of mathematics and astronomy at Bucknell from 1954-1984, and his wife, Elva Elze Polak. Preference for the scholarship award shall be given to students majoring in mathematics or astronomy.

The Charles "Charlie" Pollock '70 Memorial Scholarship was established in 2008 by his wife Gayle Pollock and by the gifts of friends to honor his memory. Charles had a major impact on Bucknell through the leadership roles he held for more than 10 years, serving as assistant to the president at Bucknell and later as vice president for student affairs. He became Bucknell's vice president for external relations in April 2006. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

The Arky Pollokoff Memorial Scholarship was established in 2001 by the family, friends and classmates of Arky Pollokoff, Class of 1978, to honor his memory. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Post Family Scholarship was established by Robert M. Post, Class of 1954, and Anne Prosser Post, Class of 1956. The scholarship award shall be made without restriction.

The William J. Post Scholarship was established in 2005 by family members and friends to honor the memory of Bill Post, a member of Bucknell's Class of 1992. The scholarship shall be awarded to students with demonstrated financial need who are majoring in engineering.

The Lisa M. Poulin, Class of 1978, Scholarship was established by Lisa M. Poulin. Awards shall be made to students based on financial need and without further restriction.

The Harry H. Powell Jr. Scholarship was created by a gift from Erika Powell in memory of her husband Harry Powell Jr., Class of 1947. Grants shall be made to a promising student from Pennsylvania to further their undergraduate education.

The Harvey M. Powers Scholarship was established in 1997 by Jane Brown Maas, Class of 1953, to honor the memory of Harvey Powers, director of Bucknell's theatre program from 1946 until 1986. The scholarship shall be awarded to students with demonstrated financial need, with first preference for students who have elected to major in theatre or English. Secondary preference will be given to students who are active participants in programs, publications or productions of the University's theatre or English departments. Awards from the fund will be made without other restriction.

The Nancy B. Prial & James D. Pavlekovsky Scholarship was established in 2000 by Nancy B. Prial, Class of 1980, and her husband, James D. Pavlekovsky. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The PricewaterhouseCoopers Scholarship was established by Jeb and Sally Stoner Bachman '78/'78, Frank and Susan Stoner Brown '78/'78, and the PricewaterhouseCoopers Foundation to provide scholarship support to outstanding students interested in career opportunities in the field of accounting.

The Puff Family Scholarship was established in honor of Dr. Robert C. Puff '42 and Mrs. Isabel Clark Puff '43 by their children and spouses: Robert C. Puff Jr. '67 and his wife, Nancy Larzelere Puff '69; Barbara Puff '69; Sally Puff Courtney '74; and Jeffrey V. Puff '75, and his wife, Rae Ann Puff. Awards from this scholarship shall be used to recruit students with demonstrated financial need and exceptional academic promise. The scholarship is intended, where possible, to provide the entire financial need of selected recipients, thereby eliminating or reducing their need to become indebted with loans for financial aid or to take time away from collegiate pursuits for work. It is the donors' hope that students selected to receive grants under this agreement will use the time saved from such extra work obligations to excel in academic efforts and engage actively in the life of the University through participation in service organizations, student government, social clubs, the arts, athletics, etc.

The Ann Purcell Scholarship was established by Ann Sundberg Purcell, Class of 1953. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Joseph T. & Mary Bachman Quick Scholarship was established in 2005 by Joseph T. Quick, Class of 1938, in loving memory of his wife, Mary Bachman Quick, Class of 1938. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Quindlen Family Scholarship was created by gifts from Thomas M. and Michele P. Quindlen in honor of Kevin J. Quindlen, Class of 2015, and Jessica M. Quindlen, Class of 2019. Grants shall be made to students based on financial need and without further restriction.

The Betty Ann Quinn Scholarship Fund was established by the Bucknell chapter of the National Association for the Advancement of Colored People, the income to be given to a worthy Black student.

The William L. Quirk Memorial Scholarship was established by his wife, Janet B. Quirk, to preserve the memory of her late husband. The scholarship is to be awarded to any student with demonstrated financial need and without other restriction.

The Dayton Ranck Scholarship was established out of respect for and in memory of Dayton Ranck, a former vice president of the University and a member of the Class of 1916. The income is to be given to a student in need of financial assistance.

The Rasmussen Family Scholarship was established in 1999 by Warren and Nancy Rasmussen, past parents '79. The scholarship shall be awarded to students with demonstrated financial need, with preference for an engineering student who is a (1) resident of Illinois or (2) resident of a Midwestern state. If neither preference can be met, the award shall be made without restriction.

The Milton M. Ratner Scholarship Fund was established by the Milton M. Ratner Foundation to provide scholarship aid to needy students who could otherwise not attend a private university.

The Reader's Scholarship was funded by a gift from Richard H. Fidler, Class of 1963, in appreciation for the individuals who read to him, and in memory of his parents, Lillian M. and Wilbert C. Fidler. As Bucknell's first blind graduate, Richard's education was made possible by the readers and the loving support and guidance of his parents. Awards shall be made to students based on demonstrated financial need.

The Henry M. Reed '44 Scholarship was established in 2000 by Henry M. Reed, Class of 1944. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Marian McIlnay Reed Scholarship was established by Marian M. Reed, the income to be used for the education or for the support and maintenance during the period of such education, of worthy and capable students.

The Robert G. Reed Memorial Scholarship was established in 2007 by his mother, Mary Ann G. Reed, his aunt, Jane W. Griffith, and other members of his family and friends to honor and preserve his memory. Robert graduated in 1972 with degrees in engineering and business. The scholarship shall be awarded to students with demonstrated financial need, with preference for students enrolled in the College of Engineering.

The Robert L. & Elva K. Reitz Scholarship was established by Robert L. Reitz, Class of 1938, and Elva K. Reitz. The scholarship award will be made with preference given to student-athletes.

The Edward J. & Patricia C. Reitzel Scholarship was established by Edward J. Reitzel, Class of 1961, and his wife, Patricia C. Reitzel. The scholarship shall be awarded to students with demonstrated financial need, with preference for student-athletes.

The Leon J. Rhodes Scholarship, established by the estate of Leon J. Rhodes, Class of 1932, shall be awarded to juniors in financial need who, in their first two years at Bucknell, have made significant contributions in scholarship, leadership and extracurricular activities.

The Professor John W. Rice Scholarship in Biology was established in 2011 by his son, Dr. Andrew C. Rice, Class of 1948, to honor his father's 43 years of teaching at Bucknell University. The scholarship shall be awarded to students with demonstrated financial need, with preference given to biology majors who have completed their first year.

The John W. Rice Memorial Scholarship was funded by a gift from the estate of Howard J. "Joe" Merrion, Class of 1938, in honor of biology Professor John W. Rice, who taught at Bucknell University for 43 years. Joe often attributed his successful career as a bacteriologist to Dr. Rice, a longtime mentor and friend. Grants shall be made to students majoring in biology.

The Richards Family Scholarship was established by Daniel R. '78 and Christine Peterjohn Richards '76 in memory of Llewellyn Phillips, Class of 1892. The scholarship is intended to help meet the financial needs of students whose presence helps match the Bucknell student body more closely to the diversity of the world community, and may be used to provide extra grants to academically superior students who are members of the varsity water polo or swimming and diving teams.

The Tom '65 & Betty Richards '65 Scholarship was created by gifts from Tom and Betty Richards, members of the Class of 1965. Grants shall be made to students based on financial need and without further restriction.

The Danforth K. & Marjorie H. Richardson Scholarship was established in 1997 by Danforth K. Richardson, Class of 1942, and his wife, Marjorie Hopwood Richardson, Class of 1943, with gifts from the Richardson Foundation Inc. The scholarship shall be awarded to students with demonstrated financial need, with first preference for students who reside in Florida, and second preference for students who reside in the Pittsburgh, Pa., metropolitan area.

The Gretchen K. '18 & Sabina G. '21 Richter Scholarship was funded by gifts from Greg P. Richter in honor of his daughters, Gretchen Richter, Class of 2018, and Sabina Richter, Class of 2021. Grants shall be made to students based on financial need, with preference given to female athletes.

The John W. Richter III Scholarship was established by his parents, John W. Richter II and Linda A. Richter, to honor his memory. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who are majoring in geology and without other restriction.

The Matthew Bunker Ridgway Jr. Scholarship was established by Gen. and Mrs. Matthew B. Ridgway and friends in memory of their son, Class of 1971, the income to be used to provide financial aid for worthy undergraduate or graduate students selected by the University without restriction.

The Mary Taubel Rieder Memorial Scholarship was established through an estate gift from Mary Taubel Rieder, Class of 1929. Preference for the scholarship award shall be given to needy and deserving students majoring in history.

The J. Paul Riesmeyer Scholarship was established in 2000 by Martha U. Grimm in memory of her husband, J. Paul Riesmeyer, Class of 1930. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in mechanical engineering.

The Harry E. Ritter '62 Engineering Scholarship was created in memory of Harry E. Ritter '62 by a gift from his beloved wife, Jeanne B. Ritter, and their sons Gary '79, Keith '82, and Robert '92. Harry served in the U.S. Navy from 1954-1958, following which he enrolled in Bucknell, graduating with a degree in electrical engineering four years later. Understanding Harry's love for the University and the path it allowed him to follow, all three sons graduated from Bucknell as well. In recognition, honor and gratitude for how instrumental Harry's experiences in the Navy and Bucknell were, the Ritter family established this scholarship. Preference for the scholarship award will be given to students majoring in electrical engineering, who are veterans of the U.S. armed services or active cadets in ROTC at Bucknell.

The Jeanne B. Ritter Scholarship was established in her honor by her husband, Harry E. Ritter, Class of 1962, and their sons, Gary A. Ritter, Class of 1979; Keith B. Ritter, Class of 1982; and Robert L. Ritter, Class of 1992. The scholarship award shall be made without restriction to students with demonstrated financial need.

The Dean Rivenburg Scholarship Fund was established by a gift from Mr. and Mrs. Virgil L. Towner in honor of Romeyn H. Rivenburg, dean of the college from 1923-1945 and vice president of the University from 1936-1945. The income is to be awarded to a worthy student in need who meets the standards of the University, with preference given to students from Ohio.

The Barbara Linsky Robbins Memorial Scholarship was established in 2003 by Richard K. Robbins, Class of 1970, to honor his mother. The scholarship shall be awarded to students with demonstrated financial need, with preference for students in the English department.

The Donald H. Robbins '39 Scholarship was created by a gift from Richard K. Robbins '70 in honor of his father, Don Robbins, Class of 1939. Grants shall be made to students based on financial need, with preference given to students majoring in environmental studies or in a health sciences discipline.

The Robbins Family Scholarship was established in 2005 by David '74 and Karen Robbins to honor the tradition of teaching that has been pursued by the following members of their family: David's grandmother, Anna Wilson Kline; his mother, Ruby Kline Robbins; Karen's grandmother, Effie Helwig Beaver; and their daughter, Caroline Cherrington Robbins '05. The scholarship shall be awarded to students with financial need, with preference for students majoring in elementary education and who have completed their freshman year in order to encourage their pursuit of excellence in education as exhibited by the members of the Robbins family.

The Dorothy E. Robertson Music Award was established by an estate gift from Miss Robertson, Class of 1931. Preference for the scholarship award will be given to a senior-year music student who intends to follow a career in music.

The Joan E. Robertson Fine Arts Scholarship was established by Joan E. Robertson, Class of 1964, in loving memory of her aunt, Helen Stoner Crighton. Preference for the scholarship award shall be given to students with demonstrated financial need who are majoring in art, theatre & dance, or English, with a minor in creative writing.

The Roberts Family Scholarship was established by W. Nelson Roberts and Jeane Morgenthal Roberts, both Class of 1947. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Louis Robey Scholarship was established in 2003 by the estate of Louis Robey. The scholarship shall be awarded to worthy students attending Bucknell University.

The Jennie S. Robinson Scholarship was established by a bequest from Jennie S. Robinson, a former teacher in the schools of Milton, Pa., and augmented by a bequest from Max Lieberman, her nephew. This scholarship is awarded to a Bucknell student selected by the faculty of Milton High School.

The Robotti Family Scholarship was created by gifts from Robert E. '75 and Suzanne Robotti. Grants shall be made to students based on the highest financial need, with preference given to students who have graduated from high schools within the five boroughs of New York City.

The Howard Roessler Family Scholarship was created by gifts from Frank Roessler, Class of 2001, to honor his father, Howard, who made a Bucknell education possible through hard work and sacrifice. Howard's dream was to begin a small restaurant with his wife, Karen, and settle down in the quaint town of Lewisburg to raise a family. Vennari's Pizza began in 1985 and this family restaurant afforded his son the ability to attend Bucknell in 1997. A true American dream lived to the fullest. Grants shall be made to students based on financial need, with preference given to first-generation college students.

The George Welliver Rogers & Mary Elias Rogers Scholarship was established in their memory through a bequest from their son, Richard. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

The Mary E. & C. Graydon Rogers Scholarship was established by Mary E. and C. Graydon Rogers, both Class of 1951. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who major in the natural sciences and without other restriction.

The Steffen H. & Athena F. Rogers Scholarship was established in 2004 by David M. Trout Jr. and Leanne Freas Trout, both members of the Class of 1950. The scholarship honors Stef and Athena Rogers on the occasion of Stef Rogers' retirement as Bucknell University's 15th president and commemorates their contribution to Bucknell during his administration.

The LeRoy H. & Edith Griesinger Rohde Memorial Scholarship was established by the family of LeRoy H. Rohde, Class of 1936, and Edith Griesinger Rohde, Class of 1937, to honor their memory. The scholarship award will be given to at least one junior and one senior each year, with preference given to students who demonstrate extracurricular leadership at Bucknell.

The Helen & Fred Rosenbauer Scholarship was funded by a gift from Peter H. '84 and Mary Ann (Rosenbauer) '83 Mattoon. Awards shall be made to students based on financial need and without restriction.

The Rudge Family Scholarship was established in 1999 by Howard J. Rudge, Class of 1958, and Lois Iffert Rudge, Class of 1959, and their children, Scott, Neal and Diana, Class of 1989, so that other students might benefit from the excellent educational opportunities available at Bucknell University. Believing in and representing the wide spectrum of activities and fields of study offered at Bucknell, the Rudges desire that the scholarship be awarded to students with demonstrated financial need and without other restriction.

The Rudge-Iffert Scholarship was established in 2004 by Howard J. and Lois Iffert Rudge. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Girard W. Rudolph Scholarship was established in 2000 by June Rudolph in memory of her late husband, Jerry Rudolph, Class of 1947. The scholarship shall be awarded to students with demonstrated financial need, with preference for students of high academic achievement majoring in music.

The Girard W. & June O. Rudolph Scholarship was established by Girard W. Rudolph, Class of 1947. The scholarship award will be made to students pursuing a degree in business administration.

The Rusling Family Scholarship was established by William E. Rusling in recognition of Ruth Castner Rusling, Class of 1952, Beverly Rusling Peltzer, Class of 1975, and Edward T. Peltzer, Class of 1972. The scholarship is awarded to students who have financial need and demonstrate gifts of leadership at Bucknell.

The Campbell Rutledge Jr. Scholarship Fund was established by the Corning Glass Works Foundation and Eleanor Cauffiel Rutledge in memory of her husband's deep and abiding interest in Bucknell, his support of its engineering program, and his belief in young people. Mr. Rutledge was a graduate of the Class of 1933 and received a master's degree in chemical engineering in 1934. The scholarship is awarded annually, with preference given to an outstanding junior or senior engineering student upon recommendation of the dean of the College of Engineering.

The Bruce & Kimberlie Sachs Scholarship was established in 2006 by Kimberlie Trego Sachs '81 and Bruce Sachs '80. The scholarship shall be given to students who would be unable to attend Bucknell University without financial assistance.

The Robert H. Sadler Memorial Scholarship was established in 2000 by friends and fraternity brothers of Robert Sadler '84. He earned a Ph.D. in microbiology/virology at the University of North Carolina (Chapel Hill). He did research in virology for the Howard Hughes Medical Institute at the University of California (San Francisco). Shortly before his untimely and tragic death, he helped decipher the Byzantine genetic structure of the Kaposi's sarcoma virus. Preference for the scholarship award shall be given to students majoring in biology and without other restriction.

The Vernon H. Salmon Scholarship was established in 2000 by Vernon H. Salmon, Class of 1949. The scholarship shall be awarded to students with demonstrated financial need, with preference given to students from the state of New Jersey and without other restriction.

The Samek Family Scholarship was established by Edward L. '58 and Marthann L. Samek '60. The scholarship shall be awarded to students with demonstrated financial need who are children of Bucknell alumni.

The Sample Family Scholarship in Engineering was created by a gift from William J. and Karen F. Sample, dedicated parents of Kevin Sample, Class of 2016. Grants shall be made to students in the College of Engineering based on financial need, without further restriction.

The Sampson Family Scholarship was established in 1992 by Benard A. Sampson, Class of 1969, and Myles D. Sampson, Class of 1967. The scholarship award shall be made without restriction.

The George F. Sandel '32 Memorial Scholarship was established in 2002 by his family, including Elizabeth Sandel, Class of 1971, and Carolyn Sandel Anderson. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in education or planning a career in education.

The Britt & Janet Saterlee Scholarship was established in 2000 with a gift by Britton W. '44 and Janet Saterlee. The scholarship award shall be made without restriction.

The Anne M. Savacool '54 Scholarship was established in 2007 by Anne M. Savacool, Class of 1954, in appreciation of the financial aid she received while attending Bucknell. The scholarship shall be awarded to students with demonstrated financial need and without restriction.

The Saxton Family Scholarship was established in 2010 by Mr. and Mrs. John A. Saxton. The scholarship shall be awarded to students enrolled in the College of Engineering with demonstrated financial need.

The Stephanie A. Sayre Scholarship was established to honor the memory of Stephanie A. Sayre, Class of 1991, by her parents, George W. and Mary Ann T. Sayre, and augmented by family and friends. As an acknowledgement of her love for the theatre, preference for the scholarship award shall be given to a student displaying special talent in the performing arts, preferably theatre, and who, without financial assistance would be unable to attend the University.

The George J. Sbordone Scholarship was established in 2010 by Barbara Sbordone Hoy, Class of 1971, and her husband, Mark Hoy, to honor the lifetime achievement of Barbara's father. The scholarship shall be awarded to a student in the College of Engineering with demonstrated financial need and no other restriction.

The William Charles Schaffner Scholarship was established in 2007 with a testamentary gift from William Charles Schaffner, Class of 1951, in memory of his parents, William W. Schaffner and Mary M. Schaffner. Awards shall be made to students from the Harrisburg Academy who are attending Bucknell University.

The Edgar & Anna Scharfenberg Class of 1938 Scholarship was established in 2009 with a testamentary gift from Doris Ann Scharfenberg, Class of 1938, in memory of her parents. Awards shall be made to worthy and deserving students and without restriction.

The Scheffler Family Scholarship was established in 1996 by Leonhardt Scheffler, Class of 1935, and his wife, Elizabeth Bentley Scheffler, M.A. 1935. The scholarship shall be awarded to students with demonstrated financial need, with preference for a junior or senior student.

The Dorothy Bunnell Schnure Scholarship was established by gifts from Dorothy Bunnell Schnure, Class of 1916, and additional contributions from family and friends. Awards from the fund will be made to students with demonstrated financial need who meet the standards of the University and without other restriction.

The Frederick O. & Elise Miller Schnure Scholarship was established by Frederick O. Schnure Jr., Class of 1942, and Elise Miller Schnure, Class of 1945. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Robert Bunnell & Annabel Kreider Schnure Scholarship was established by Robert B. '40 and Annabel K. Schnure '40. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Schoeneman Family Scholarship was established in 2010 by Frank K. Schoeneman, Class of 1976, and his son, F. Kyle Schoeneman, Class of 2006. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who are residents of Schuylkill County, Pa.

The John F. Schrankel Scholarship was established by John F. Schrankel, Esq., Class of 1951. Preference for the scholarship award shall be given to students studying political science or history who demonstrate financial need and academic achievement.

The Schreiner Family Scholarship was created by gifts from Frank J. Schreiner, Class of 1983, in appreciation of his Bucknell experience and so that future generations of students, regardless of financial means, will enjoy similar opportunities. Grants shall be made to students based on financial need, with preference for first-generation college students.

The Schubauer Family Scholarship was established in 2000 by James W. Schubauer, Class of 1956, and his wife, Barbara. Grants from this scholarship shall be made to middle-income engineering students who are United States citizens.

The Schulte Family Athletic Scholarship was established by Frederick A. Schulte Jr. and Carol E. Schulte, parents of Scott F. Schulte '81. Preference for awards from this scholarship shall be given to talented scholar-athletes with demonstrated financial need and who are members of the varsity water polo or swimming teams.

The Schumacher Family Scholarship was established in 2001 by John F. Schumacher, Class of 1966. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who graduated from high schools in the following counties of southeast Massachusetts: Barnstable, Plymouth, Bristol, Nantucket and Dukes.

The John D. Scoutten Memorial Scholarship was established by a gift from the family and friends of John D. Scoutten, Class of 1970, the income to be used by any qualified applicant who, without such financial assistance, would not be able to attend the University. Preference is to be given to graduates of Culver Military Academy.

The Seaborn Family Scholarship is funded by gifts from Emmett O'Neal Seaborn III, Class of 1982; Donna Schroeder Seaborn, Paige Elizabeth Seaborn, Class of 2012; Harrison Schroeder Seaborn; Clara Rose Seaborn, Class of 2018; and Isabel Grace Seaborn, Class of 2020. Grants shall be made to students based on financial need and without further restriction.

The Segal Family-United World Scholarship was created by Leanne and Michael Segal, dedicated Bucknell parents. The scholarship honors Kaitlin Segal Stoddard, Class of 2011, and Thomas Stoddard, Class of 2011, who thrived at Bucknell University. Grants shall be made to students based on financial need and without further restriction.

The Sandra Selby Scholarship was established by Sandra F. Selby, Class of 1974. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Germaine Roshon Seltzer Scholarship was established through a bequest from William O. Seltzer in memory of his wife, Germaine Roshon Seltzer, Class of 1942. First preference for the scholarship award will be given to undergraduate students majoring in the biological sciences or in pre-medical or pre-nursing studies.

The Seltzer Family Scholarship was established in memory of Ethel M. '42 and Charles J. Seltzer '42 and their children: Charles J. Jr., Richard A. '70, Robert C. '74 and Barbara R. '78. Preference for the scholarship award shall be given to students majoring in management with a concentration in marketing or accounting.

The Shand Family Scholarship was established by J. Richard and Gail Rothenberger Shand, both Class of 1955, and their children: J. Richard Shand Jr. '81, David A. Shand '87 and Barbara Shand Neff '90. The scholarship shall be awarded to students who are United States citizens with demonstrated financial need, with preference given to students who are majoring in engineering, physical sciences or mathematics.

The William & Ann Sharp Scholarship was established in 2000 by William H. Sharp Jr. and Ann Hardy Sharp, both members of the Class of 1959. The scholarship shall be awarded to students with demonstrated financial need.

The Shassian Family Fund for International Service-Learning was established as an endowed fund with gifts from Donald R. Shassian, Class of 1977, and Pamela Heller Shassian, Class of 1978. Income from the fund provides students with need-based support to participate in international service-learning courses.

The Shaw Family Scholarship was established by Donald M. and Marguerite M. Shaw, and their son, Andrew M. Shaw, Class of 1991. The scholarship award shall be made without restriction.

The Shaw Family Scholarship was funded by a gift from Jeff and Jeanie Shaw in honor of their daughters, Rebecca Shaw, Class of 2009, and Hannah Shaw, Class of 2015. Grants shall be made to students based on financial need and without further restriction.

The Sheehy Family Scholarship was created by gifts from Jay, Class of 1977, and Theresa Sheehy, dedicated parents of Adam H. Sheehy, Class of 2009. Grants shall be made to students based on financial need and without further restriction.

The Marie M. & Fred S. Shehadi Sr. Family Scholarship was established in 2001 by their son, Fred Jr., Class of 1954, and their Bucknell grandchildren: David, Class of 1981; John, Class of 1984; and Lauren Herbert, Class of 1991. The scholarship shall be awarded to students with demonstrated financial need.

The Neil F. Shiffler Memorial Scholarship was established in 2015 to honor the memory of a professor in the management department who taught business majors from 1950 to 1986. Neil's greatest satisfaction came from helping students acquire the skills necessary to succeed in the business community. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in management.

The Juan del Castillo & Susan G. Shipe Scholarship was established with a gift completed in 2007 by Juan del Castillo and Susan G. Shipe. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Mary Reese Shorts & Arthur Mead Shorts Scholarship was established in 2006 by Mary Reese Shorts, Class of 1932, to honor the time she and her husband, Arthur, Class of 1930, spent at Bucknell. The scholarship award shall be made without restriction.

The John H. Shott Memorial Bison Club Scholarship Fund is to be awarded annually to deserving students who are of good character and who need financial assistance, with preference to be given to those with athletic ability.

The William C. & Ruth W. Shure Memorial Scholarship was established in 2005 by an estate gift from Ruth W. Shure, Class of 1930, to commemorate the friendships and education acquired during the years of student and alumni relationships to Bucknell. Because of the wide-ranging interests of both Ruth and William Shure, Class of 1930, the scholarship was established to aid needy students and without other restriction.

The Barrett K. Sides Empowerment Scholarship was established by Barrett Sides '87. In the interest of providing opportunity and promoting cultural diversity on campus, the scholarship shall be awarded to a student from the continent of Africa with demonstrated financial need and without further restriction.

The Dr. Evan B. Siegel Scholarship was created by gifts from Dr. Evan B. Siegel, Class of 1969, who serves as president and CEO of Ground Zero Pharmaceuticals in Irvine, Ca. Grants shall be made to students based on financial need and without further restriction.

The David Simpkins Scholarship was established by a bequest from Adalene Van Duyne Simpkins to honor her son, David J. Simpkins, Class of 1972 (B.A. Economics/B.S. Mechanical Engineering) and Class of 1974 (M.S. Mechanical Engineering). The scholarship shall be awarded to students with demonstrated financial need, with preference for students who are majoring in mechanical engineering.

The Blanche Thomas Simpson & Geddes Wilson Simpson Scholarship was established by Blanche Simpson Bast, Class of 1961; Geddes W. Simpson Jr., Class of 1967; Frank T. Simpson; and Mary Simpson Sunar; in honor of their parents, Blanche, Class of 1930, and Geddes, Class of 1929. The

scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in math or the sciences and without other restriction.

The Frank M. Simpson Scholarship was established in 2000 by Dr. Geddes W. Simpson, Class of 1929, in memory of his father, Frank M. Simpson, Class of 1885, who was a professor of physics at Bucknell from 1902 until 1942. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Ted R. & Louise (Fowle) Simpson '52 Scholarship was established with gifts from David R. Hamill, Class of 1981, to honor his aunt and uncle who met at Bucknell in 1948 and have sustained a lifelong affection for the campus ever since. The meaningful family connection influenced David to attend Bucknell, thus continuing the family's legacy at the University for another generation. Awards shall be made to students in the College of Arts & Sciences based on financial need.

The Michael F. Sinkus Scholarship was established by Michael F. Sinkus Jr. The scholarship award will be made without restriction.

The Dick Skelton Scholarship was established in 2000 by friends and trustees of Bucknell at the time of Dick's retirement to honor his more than 36 years as an admissions officer at Bucknell. Preference for the scholarship award is to be given to students from Wayne, Pike or Monroe counties, Pa., who demonstrate financial need.

The Kenneth W. Slifer Scholarship was established in 2001 to honor the memory of Ken Slifer, Class of 1926, by one of the many young men he encouraged and helped to attend Bucknell, thereby changing his life. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Paul Wilbur Slifer Scholarship was established by a bequest of Adam Conrad Slifer in memory of his son, for a deserving and needy student.

The Smalstig Memorial Scholarship was established by family, friends and classmates in memory of Edward J. and Alice Drennen Smalstig '31/'31. The scholarship shall be awarded to deserving students in either the College of Engineering (with preference given to civil engineering students) or the College of Arts & Sciences (with preference given to biology majors), in order to encourage and enable them to study abroad.

The Lloyd & Myrna Smith Scholarship was established by Robert M. Brodrick, Class of 1961, in memory of his maternal grandparents. Preference for the scholarship award shall be given to engineering students.

The Marjorie Bell Smith Scholarship was established by I.R. Smith, M.D., in memory of his wife, Class of 1928, to be awarded to students who meet the University's academic standards, the preference to be given to majors in English.

The William H. Smith III, Class of 1970 Scholarship was established in 2008 by William H. Smith III. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in mechanical engineering who are United States citizens.

The Harry E. Smithgall Scholarship was established by Harry E. Smithgall, Class of 1936. The scholarship shall be awarded to students majoring in electrical engineering, with preference to students who reside in Lycoming County, Pa.

The Bonnie Shihadeh Smithwick Memorial Scholarship was established in 2003 by members of the Class of 1968 at the time of their 35th Reunion. The scholarship is named in memory of Bonnie Shihadeh Smithwick, who was lost to us on September 11, 2001, but it is also intended to honor the memory of other classmates who have left us too soon. The scholarship shall be awarded to a deserving undergraduate student or students with demonstrated financial need.

The SMV Technologies Inc. Scholarship was funded with a gift from Stephen N. Thorp, Class of 1958, and his wife, Betty M. Thorp. It is the donors' desire for others to enjoy similar educational opportunities that were afforded to Stephen by Bucknell University. Awards shall be made to students enrolled in the College of Engineering based on financial need and without further restriction.

The Ralph R. Snow Scholarship was established by Ralph R. Snow, A.M., B.D., Class of 1894, for graduates of the Franklin High School, Pa.

The Harold M. Soars Scholarship was established by gifts of the Sprout Waldron Foundation and of Harold M. Soars, former chairman of the Sprout Waldron Co. and a trustee of the University. The income from the fund is to be used to provide financial assistance to a student pursuing a degree at Bucknell, with preference given to students from Lycoming County, Pa., and from the counties contiguous to it, who are pursuing a degree in engineering.

The Margaret G. Sober '34 Memorial Scholarship was established in 2002 by her sister, Annabelle F. Sober. The scholarship shall be awarded to students with demonstrated financial need, with preference for English majors.

The Dirk A. Sojka Scholarship was established in 1989 by a gift from Helen R. Smith-Morgan in honor of her grandson. The scholarship shall be awarded to students with demonstrated financial need, with first preference going to students enrolled in master's degree programs in school psychology, with an interest in special education. Undergraduate students with interest in special education are also eligible for awards from this fund.

The Gary & Sandy Sojka Scholarship was established in 1995 by the Bucknell University Alumni Association to honor Gary and Sandy Sojka on the occasion of Gary Sojka's retirement as Bucknell University's 13th president, and to commemorate their contribution to Bucknell during his

administration. In keeping with the Sojkas' longstanding, broad, and all-inclusive interest in Bucknell students, awards from this fund shall be made to students with demonstrated financial need and without other restriction.

The Sommers Family Scholarship was established by John and Catherine Sommers, Class of 1961. Preference for awards from this scholarship shall be given to talented scholar-athletes with demonstrated financial need, recommended by the director of athletics and the coaches.

The Spartan Scholarship was established in 2011 by Douglas M. Hitchner, Class of 1983, and George A. Tsougarakis, Class of 1983. The scholarship shall be awarded to students with demonstrated financial need, with preference for students participating in intercollegiate athletics, particularly soccer.

The Speer Family Scholarship was established by Edison C. and Nancy B. Speer '57/'56. The scholarship shall be awarded to students with demonstrated financial need, with preference for students from western Pennsylvania and without other restriction.

The Herbert L. Spencer Scholarship was established by the Spencer family in memory of Bucknell's eighth president. The scholarship award will be made without restriction.

The Sally L. Spencer Scholarship was established through gifts from the Spencer family and is named for Sally L. Spencer, Class of 1953. Preference for the scholarship award shall be given to needy and deserving students whose character, ethics and commitment to serving others represent the best in human nature.

The Jessie Lovell Sprague Music Scholarship Fund was established by Jessie Lovell Sprague, Class of 1902, the income to be used for a deserving woman student studying voice and with wholesome interest in her fellow students.

The Donald B. & Dorothy L. Stabler Scholarship Fund was established in 2010 by the trustees of the Donald B. and Dorothy L. Stabler Foundation. Income from the fund shall be awarded to worthy students with demonstrated financial need.

The Harry E. Stabler Athletic Scholarship was established by an estate gift from Harry E. Stabler, Class of 1923. Preference for the scholarship award shall be given to student-athletes from Broome County, N.Y. It is the donor's preference that, if possible, first preference be given to football players and second preference to basketball players. If no students from Broome County qualify, then the scholarship shall be awarded to a student-athlete from another area.

The Stackpole-Hall Foundation Scholarship was established in 1973 for a needy and disadvantaged student majoring in business or engineering.

The Dominick & Martha Staiano Scholarship was established by Edward F. Staiano, Class of 1958, and his wife, Janet Smith Staiano, Class of 1958, in honor of his parents. Grants from the scholarship will be made under the direction of the dean of the College of Engineering and used to recruit and retain the best possible undergraduate students from the College of Engineering. The scholarship shall be awarded to students without other restriction.

The Mary Stanton Scholarship Fund was established by John W. Speicher in honor of his wife and is to be awarded to a deserving student in the upper third of his/her class.

The Emily Jane Stec Memorial Scholarship was established in 2000 by her parents, Arlene Nemeth Stec, Class of 1949, and Edward J. Stec, Class of 1950. The scholarship shall be awarded to students with demonstrated financial need, with preference for students gifted in the field of dramatic arts who elect the study of theatre as an academic major or minor.

The Gordon & Joan Stetz Scholarship was established in 2011 by Gordon M. Stetz, Class of 1983, and his wife, Joan M. Stetz, Class of 1980. The scholarship shall be awarded to students who are pursuing a bachelor of science in business administration with demonstrated financial need.

The Alice Stevens Scholarship was established in 2005 by Alice L. '45 and Mike Volechenisky. Preference shall be given to students majoring in physics or chemistry.

The Austin & Anna Thompson Stevens Scholarship was established by Alden S. Thompson, Class of 1937. Preference for the scholarship award will be given to those with an interest or major in journalism or literature.

The Harold A. Stewart Scholarship was established by Mr. Stewart, Class of 1920, and trustee emeritus. Preference for the scholarship award will be given to students from western Pennsylvania, especially Westmoreland County.

The Stewart Family Scholarship was funded by gifts from Mitchell Stewart, Class of 2000, and Patty Stewart, Class of 1999. The scholarship is in appreciation of the wonderful education they received while at Bucknell, their gratitude for the opportunities that Bucknell provided, and for allowing them to meet each other while in school. Awards shall be made to students based on financial need and without restriction.

The Stewart Family Scholarship was established by Richard W., Class of 1966, and Grace H. Stewart. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who graduated from Springfield Township High School, Montgomery County, Pa.

The Charles F. Stickney Scholarship was established by Dorothy Turnbach Stickney, Class of 1949, in memory of her husband, Class of 1948, and professor emeritus of physics. Preference for the scholarship award will be given to students majoring in physics or music.

The Harold R. & Jacqueline S. Stiefel Memorial Scholarship was established in 1993 by family, friends and members of the Sigma Alpha Mu fraternity in memory of Harold R. Stiefel, Class of 1949, and his wife, Jacquie. The Stiefels were longtime owners of the Lewisburg Campus Theatre, enthusiastic fans of Bucknell basketball and beloved members of the Bucknell community. Preference for the scholarship award shall be given to members of the Bucknell basketball team who have demonstrated financial need.

The Stier Family Scholarship was created by a gift from Jennifer L. Stier, Class of 1989. Grants shall be made to students based on financial need and without further restriction.

The Professor Paul G. Stolz Scholarship was created by gifts from his grandchildren, P. George Benson '68, Louise Stolz Gorny, Charles E. Benson '73 and Robert J. Stolz, to honor the memory of Paul G. Stolz, Class of 1906, who led the Bucknell Music School and Department of Music from 1908 to 1948. Grants shall be made to students based on financial need, with preference given to students majoring in music.

The George & Mary Gibb Strachan Memorial Scholarship was established in 2000 by Robert G. and Patricia Wenk Strachan '58/'57, and their daughter, Ellen Strachan Wilsterman '85. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Franklin R. Strayer Scholarships, five in number, were established by a bequest of Franklin R. Strayer, Class of 1894, in memory of his professors: William Cyrus Bartol, George G. Groff, John Howard Harris, William Gundy Owens and Frank Ernest Rockwood.

The Strickland Family Scholarship was established in 2001 by Frank W. Strickland, Class of 1946 and a former Bucknell University Alumni Trustee, and Eleanor Dillon Strickland, Class of 1946. The scholarship shall be awarded to students with demonstrated financial need, with first preference to descendants of Frank W. Strickland and Eleanor Dillon Strickland, and then to qualified students who graduated from high schools in Bergen County, N.J., or Bucks County, Pa.

The Dorothy M. & Edward H. Stubenrauch Scholarship was established in 2000 by Dorothy M. Stubenrauch, past parent. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in engineering and without other restriction.

The Student-Faculty Congress Scholarships were established in 1965 for two or more needy students of the senior class who are in good academic standing and have given commendable service to the University.

The Susan Suhr & Marina Viale Scholarship was established in 2005 by Susan E. Suhr, Class of 1972, and Marina E. Viale. Preference for awards from the scholarship shall be given to female engineering students who are U.S. citizens with demonstrated financial need, especially those interested in mechanical, electrical or biomedical engineering.

The Jeremiah & Barbara Sullivan Scholarship was created by gifts from Chris Sullivan, Class of 1992, and Jennifer Sullivan to honor Jeremiah and Barbara Sullivan, parents of Chris and Lisa Sullivan Tobin, Class of 1989. Grants shall be made to students based on financial need.

The Suth Family Goldman Sachs Scholars Fund was established with gifts from Goldman Sachs Gives at the recommendation of Richard Suth, Class of 1992. Awards shall be made to students based on financial need. Students supported by this fund shall be known as Suth Family/Goldman Sachs Scholars.

The Phoebe A. Suyden Scholarship was established by a bequest of Mrs. Suyden, the income to be awarded to a deserving student.

The Kevin S. Swaim Family Scholarship was created by gifts from Bucknell parent Nancy K. Swaim and her sons, Tyler S. Swaim, Class of 2014, and Connor K. Swaim, Class of 2019, in memory of Bucknell parent Kevin S. Swaim. Grants shall be made to students in the College of Management based on financial need and without further restriction.

The Lester A. & Miriam M. Switzer Memorial Scholarship Fund was established by a bequest of Mrs. Switzer, the income to be used as a scholarship for a deserving student.

The Tague Family Scholarship was established by Barry E. Tague, Class of 1960, and his wife, Dorothy Tague. Preference for the scholarship award shall be given to students from the greater Philadelphia area, with demonstrated financial need, whose ethnic, racial, economic or national origins add to the diversity of Bucknell.

The Dr. Roy C. Tasker Scholarship was established by his daughter, Lois Anne Tasker, and supplemented with gifts by friends and former students to honor the memory of Dr. Roy Carleton Tasker, who taught biology at Bucknell from 1934-1966. Preference for the scholarship award shall be given to students majoring in biology, with first preference given to pre-med students.

The Marianne E. Szoo Teleky Memorial Scholarship was established with a gift from her daughter, Priscilla M. Teleky, Class of 1961, and Paul W. Davis, Cornell University, Class of 1952 and 1959. Preference for the scholarship award shall be given to students with visual impairments pursuing degrees in mathematics, engineering or economics; however, other disciplines are not disqualified. Given "in lasting memory of my beloved mother, Marianne E. Szoo Teleky, born in Hungary, whose wisdom, courage and loving sacrifice wove the fabric of my comfortable and meaningful life. With this memorial scholarship, Mother's honorable, unselfish spirit and constructive energies will forever serve worthy students and Mother's memory will endure."

The Theta Chi Alumni Association Scholarship was established in 1968 for a member of Theta Chi fraternity.

The Stanley C. Thomas Scholarship was established in memory of Blanche Thomas Simpson, Class of 1930, in memory of her brother, Stanley Thomas, Class of 1938 (M.A. 1946).

The Hamilton O. & Lillian Somers Thompson Scholarship was established by Hamilton O. Thompson, Class of 1939, in memory of his wife, Class of 1938. The scholarship award will be made without restriction.

The Joan Groulx Thompson Scholarship was established by Dr. Alden S. Thompson, Class of 1937, and his family to preserve the memory of Joan G. Thompson, Class of 1949. Preference for the award shall be given to students of the biological sciences.

The William Homer Thompson Scholarship was established by William Homer Thompson, a former trustee of Bucknell University, with preference to be given to a graduate of The Peddie School or of the Hightstown High School, N.J.

The William Thoms, Jr. '77 M.D. Engineering Scholarship was created by a gift from William Thoms Jr., Class of 1977, honoring chemical engineering Professors Robert E. Slonaker Jr. and William Snyder. Grants shall be made to students based on financial need, with preference given to students in the College of Engineering.

The Freeman T. & Anna L. Tingley Scholarship was established by an estate gift from Anna L. Tingley in memory of her husband, a member of the Class of 1922. The scholarship award shall be made without restriction.

The Robin Sundy Tingue Memorial Dance Scholarship was established in 2006 to honor and preserve the memory of this member of the Class of 1987 by her husband, David Tingue. The scholarship shall be awarded to students with demonstrated financial need, and to commemorate Robin's active participation as a dancer at Bucknell, with preference for students engaged in the dance program, either as declared majors or as active and regular participants in the study and performance of dance.

The T. Donald Titus and Joan B. Titus Scholarship was established by Joan B. Titus. Grants shall be made to children of deceased members of the United States Military (Army, Navy, Air Force, Marine, National Guard and Coast Guard) and their reserves who lost their lives during active duty or in training exercises.

The Edgar A. & Florence E. Tomlinson Scholarship was established by Edgar A. Tomlinson, Class of 1939. The scholarship award shall be made without restriction.

The Trangucci Family Scholarship was established in 2010 by Neale Trangucci, Class of 1979, and his wife Harriett Trangucci, parents of members of the Class of 2009 and 2013. The scholarship is in recognition of the compassion and inspiration provided by Mr. Robert Latour, Bucknell director of athletics (1968-1978). This scholarship shall be awarded to students with demonstrated financial need who bring diversity to the campus and help create a student body representative of the world outside of Bucknell.

The Harland A. Trax Scholarship was established by a gift from Harland A. Trax, A.M., LL.D., Class of 1901.

The Paul L. & Eleanor M. Troast Scholarship was established in memory of Paul L. Troast, a trustee of the University from 1949-1969, by gifts from a family foundation and enhanced by additional contributions made by his sons, Arthur L. Troast, Class of 1950, and John G. Troast, Class of 1953; his grandsons, John G. Troast Jr., Class of 1979, Arthur P. Troast, Class of 1983, Douglas K. Troast, Class of 1985, and Gary S. Troast, Class of 1987; and his great-grandsons, Brian Troast, Class of 2006, and Tyler Troast, Class of 2008. Grants shall be made to students based on financial need, with preference given to students who demonstrate excellence in the fields of engineering, management or political science.

The David & Leanne Trout Scholarship was established by Federal Paper Board Co. Inc. to honor David M. Trout Jr., a Bucknell trustee and member of Bucknell's Class of 1950, on the occasion of his retirement from the company. The scholarship award is unrestricted.

The Leanne Freas Trout Scholarship in French & Francophone Studies was established in 2009 by R. Leanne Freas Trout, a member of the Class of 1950. The scholarship will be used to recruit and retain students majoring in French & Francophone studies at Bucknell.

The Trout Family Scholarship was established by David M. Trout, Class of 1950, and his wife, R. Leanne Freas Trout, Class of 1950. First preference for the scholarship award shall be given to graduates of Branford (Conn.) High School, and second preference to students who are residents of Connecticut.

The Trout Family Arts Scholarship was established in 2003 by David M. and R. Leanne Freas Trout Jr., both members of the Class of 1950. Grants from the scholarship will be awarded to academically superior students of art and art history.

The Ralph & Joan Meister Truby Scholarship was established under an agreement completed in 2005 and funded through a bequest from the estate of Joan Meister Truby, Class of 1953. The scholarship shall be awarded to students with demonstrated financial need, with preference for students majoring in biology.

The Robert E. & Lorraine A. Soresi Tweed Scholarship was established in 2006 by Robert E. and Lorraine A. Tweed, both members of Bucknell's Class of 1956. The scholarship shall be awarded to students with demonstrated financial need, with preference for students from North Carolina and without other restriction.

The Margaret Young Underhill Scholarship was established in 1998 by the family and friends of Margaret Young Underhill, Class of 1933, to honor her memory. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Ronald L. & Benita K. Unger Scholarship was established in 2007 by Ronald Unger, Class of 1951, to honor his wife for sharing with him her lifelong love of music, which has brought them both much joy. The scholarship shall be awarded to students enrolled in the College of Arts & Sciences with demonstrated financial need and without other restriction.

The Unrein Family Scholarship was created by a gift from Larry and Eileen Unrein, dedicated parents of Peter Unrein, Class of 2017. Grants shall be made to students based on financial need and without further restriction.

The Van Schooneveld Family Scholarship was established in 2010 by Robert and Joyce Selley Van Schooneveld, Class of '75, to honor their family's history with the University. The scholarship shall be awarded to students with demonstrated financial need and limited to students enrolled in engineering and/or management and without other limitation.

The Theodore J. VanKirk Memorial Scholarship was created in memory of Dutch VanKirk, Class of 1949, through gifts from his son, Thomas L. VanKirk, Class of 1967, and daughter-in-law, Bonnie W. VanKirk. As a captain in the Army Air Forces, Dutch served as the navigator of the Enola Gay, the B-29 Superfortress bomber that helped end World War II. He retired from military service in 1946 as a major having received the Silver Star and Distinguished Flying Cross. He earned his bachelor's and master's degrees in chemical engineering from Bucknell. Grants shall be made to students based on financial need, with preference given to students majoring in chemical engineering.

The Lee N. & Grace Q. Vedder Foundation Scholarship was established in honor of Professor Paul Benson, the income to be used for a student in the field of mathematical and applied statistics.

The Elizabeth Veit Scholarships were established by a bequest of Elizabeth Veit for young men who are preparing to enter the ministry of the Baptist Church.

The Charles I. & Virginia Vogel Scholarship was established by Charles I. and Virginia Vogel ’37/’40. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The William '73 and Judith '75 Vogel Scholarship was created by a gift from the Vogel Family Foundation. Grants shall be made to students based on financial need and without further restriction.

The Charles A. & Catherine M. Vosburg Memorial Scholarship was established by Charles M. Vosburg (B.S. ’58) in memory of his parents. Preference for the scholarship award will be given to R.O.T.C. cadets who are candidates for the B.S. degree with declared majors in the physical sciences or engineering, and who are also United States citizens.

The Walker Family Scholarship was established by Ray S. and Louise S. Walker. The scholarship award will be given to graduates of high schools in Clearfield County, Pa. It is the intent of the donors that the scholarship recipient(s) shall endeavor to enhance the economic and cultural well-being of the areas served by the eligible high schools.

The Doug & Inta Walker Scholarship was established in 1998 by Douglas and Inta Esmanis Walker, both Class of 1966. The scholarship shall be awarded to students with demonstrated financial need who are majoring in engineering, and whose life experiences contribute to the cultural and intellectual climate of the campus, including first-generation college students, students from outside the University’s traditional geographic area, and those who bring cultural and intellectual diversity to the campus.

The Anna M. Wall Scholarships were established by Anna M. Wall, with preference given to women.

The Anna Slifer Walls Scholarship was established by William C. Walls, Class of 1873, in memory of his wife, Institute Class of 1872, for a student who is majoring in history or literature and who lives in Union County or in a designated portion of Northumberland County.

The Anna Slifer Walls Memorial Fellowship in Biological Research was established by heirs named in the E. Slifer Walls estate, to be made available first to students from Union County, then central Pennsylvania and finally to students from any other area.

The Dr. E. Slifer Walls Scholarship was established by William C. Walls in memory of his son, Class of 1903, for a student who is majoring in a pre-medical or a public health course, and who lives in Union County or in a designated portion of Northumberland County.

The Dorothy Moody Warren Scholarship Fund was established by Mrs. Warren, an alumna, to provide three scholarships each year, with preference to be given to full-time, needy students who are graduates of Shamokin Area High School, Pa., or Bridgeton High School, N.J.

The Warshauer Family Scholarship was funded by a gift from Robert H. '80 and Denise Warshauer, dedicated parents of Lauren Warshauer, Class of 2014, and Melissa Warshauer, Class of 2017. Awards shall be made to selected students in the College of Engineering based on financial need.

The P. Herbert Watson Memorial Scholarship was established by his wife, Dorothea B. Watson, and friends to honor the memory of her husband, Class of 1937. Preference for the award will be given to music majors as acknowledgement of his love for music.

The Dr. & Mrs. Joseph Weaver Scholarships were established by a gift from Col. Joseph Kerr Weaver, Class of 1861, and were named by action of the Board of Trustees in honor of Dr. and Mrs. Joseph K. Weaver.

The Harold F. & Marguerite P. Webber Memorial Scholarship was established by family and friends. The income is to be used to aid worthy and needy students who otherwise could not afford a college education. Preference shall be given to civil engineering, music and management majors.

The Rev. Dr. John Weaver & Eleanor Grose Weddell Scholarship was established by Arthur L. (AM '27, H '74) and Margaret Weddell Brandon (AB '16, AM '31) to honor the memory of the Weddells. Preference for the award shall be given to students of the liberal arts contemplating a career teaching English or a life involved with religion, without regard for their specific creed or denomination.

The Sigmund & Claire G. Weis Scholarship was established by Claire G. Weis, the income from which is to be awarded annually to one or more students in the Department of Management.

The Thomas & Karen Horn Welch Family Scholarship was established in 2008 by Karen Horn Welch and Thomas W. Welch III, both members of Bucknell's Class of 1997. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Patricia Woodburne Wells Scholarship was established by Ronald V. Wells, honorary Doctor of Divinity 1968, and Patricia Woodburne Wells, Class of 1935. The scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Peter C. Welpton Scholarship was established in his memory by his family, members of his Class of 1965 and friends, the income to be used for a worthy student majoring in economics.

The John S. Wheatcroft Scholarship was funded by a gift from Barbara Rose O'Connor, Class of 1989, and her husband Vania, to honor Jack Wheatcroft, Class of 1949, for his dedication to the craft of writing and ensuring students received the best liberal arts education possible. A nationally known author, Jack was an English professor at Bucknell from 1952 until his retirement in 1996. He published 26 books and earned the distinction of Presidential Professor in 1972. Jack founded the Stadler Center for Poetry in 1988 with Jack Stadler, Class of 1940. Grants from the John S. Wheatcroft Scholarship shall be made to students based on financial need and without further restriction.

The Claire Halline Wieder Scholarship was established in her memory by members of her Class of 1958 and friends, the income to be used for a deserving woman student.

The Frank L. Wiegand III, Class of 1960, & his daughter Maryanne Wiegand, Class of 1983, Scholarship was established in 2000 by Frank L. Wiegand III, Class of 1960, and his daughter Maryanne Wiegand, Class of 1983. The scholarship shall be awarded to undergraduates with demonstrated financial need who are U.S. citizens, with preference given to students who are the children of Bucknell alumni.

The Doris K. Williams Scholarship was established by Stanley G. Williams, Class of 1943, in honor of his wife. Preference for the scholarship award shall be given to students majoring in computer science.

The Ellen P. & Samuel L. Williams Endowed Scholarship for Music was created in 2009 through a bequest from Ellen Peterson Williams, Class of 1919, to honor the time she spent at Bucknell and the memory of her husband, Samuel L. Williams. The fund provides scholarship assistance for students studying music at Bucknell University.

The Lee A. & Annis Williams Scholarship was established by Stanley G. Williams, Class of 1943, and his wife, Doris K. Williams, in memory of his parents. The scholarship award will be made without restriction.

The Norman Lee Williams Scholarship was established by Stanley G. Williams, Class of 1943, in honor of his brother. Preference for the scholarship award shall be given to students majoring in computer science.

The Robert M. & Virginia K. Williams Scholarship was established by Robert M., Class of 1962, and Virginia K. Williams, Class of 1963. Preference for the scholarship award shall be given to students majoring in education with demonstrated financial need.

The Ruth Williams Scholarship was funded by gifts from Jo-Anne Williams, Class of 1986, in memory of her mother. Awards shall be made to students who are residents of the United States based on financial need and without further restriction.

The T. Cortlandt & Evelyn D. Williams Scholarship Fund for Engineering Students is awarded to a student who has completed the first two years at Bucknell or a junior college, and who, in the opinion of the dean of the College of Engineering, shows outstanding interest in and aptitude for the engineering profession.

The William V. Wilson Scholarship was established in memory of the Rev. William V. Wilson, D.D., of New Jersey.

The U Kyaw Win & Gandasari A. Win Scholarship was established in 2000 by U Kyaw Win and Gandasari A. Win. The scholarship is intended to benefit the nation and people of Burma by providing grants for current or future Burmese citizens who are students at Bucknell and who have demonstrated financial need.

The Wingover Farm Scholarship was established in 2004 by William T. '45 and Gladys B. Watkinson. Awards for this scholarship shall be made without restriction.

The Mollie W. Woehling '47 Scholarship was created by gifts made in honor of Mollie W. Woehling, Class of 1947, by her family. The scholarship was established to commemorate Mollie's abiding love for the University and the Woehling family's legacy at Bucknell. Members of the family include: Katharine (Woehling) Stowe '81, M'83; Donald Woehling '74; and Edward '72 and JoAnne M'80 Woehling. The scholarship shall be awarded to students with demonstrated financial need, with preference to students in the College of Arts & Sciences.

The Florence E. Wolfe Memorial Scholarship was established by her son, Bucknell's former vice president for university relations, Charles W. Wolfe, to honor his mother's memory by assisting qualified students through the general scholarship funds of the University.

The Oscar Wolfe Engineering Scholarship was established in 2001 through a bequest from Anton O. Wolfe, Class of 1939, in memory of his father, Oscar Wolfe, Class of 1912. The scholarship shall be awarded to students with demonstrated financial need who are enrolled in the College of Engineering.

The Wynee Wong Memorial Scholarship was established in 2005 by her mother, Ellen C. Wong, and her family and friends. The scholarship fund honors the memory of this 2004 graduate of Bucknell by continuing the financial aid Wynee received as a Bucknell student. This scholarship shall be awarded to students with demonstrated financial need and without other restriction.

The Thomas '05 & Blanche Stoner Wood '05 & son, 2nd Lt. James Wood '43, Scholarship was established in 1999 by members of the Wood family. The scholarship shall be awarded to students with demonstrated financial need, with preference for students who have achieved academic excellence in high school.

The Robert B. Woolhouse Scholarship was established in 2000 under a deferred gift plan funded by Robert B. Woolhouse, Class of 1951. The scholarship shall be awarded to students with demonstrated financial need.

The William W. & Myrtle E. Woolhouse Scholarship was established in memory of his parents under a deferred gift plan funded in 2000 by Robert B. Woolhouse, Class of 1951. The scholarship shall be awarded to students with demonstrated financial need.

The Audley C. Wynkoop Scholarship was established by Claire Wynkoop Carlson, Class of 1949, in memory of her father, the income to be used for a deserving engineering student chosen by the dean of the College of Engineering, acting upon the recommendations of the Bucknell University Scholarship Committee.

The Paul M. Wythes Jr. Class of 1990 Scholarship was established in 1990 in his honor by his parents, Mr. and Mrs. Paul M. Wythes. The scholarship award will be made annually without restriction to financially deserving undergraduates.

The M. David Yamamoto Scholarship was established in memory of David Yamamoto, M.A. 1957, by his wife, T. Atsuko Yamamoto, M.A. 1956, and friends. Awards from this fund will be made available to students with demonstrated financial need who are enrolled in the Japanese studies program.

The William '70 & Lois Yeomans Scholarship was established in 2005 by Clifford K. "Mickey" Melberger, Class of 1961, and his wife, Ruth B. Melberger, in honor of his sister and brother-in-law. The scholarship shall be awarded to students with demonstrated financial need.

The Zafirovski Family Scholarship was established in 2004 by Robin Gale Zafirovski, Class of 1979, and Mike Zafirovski. The scholarship shall be awarded to students with demonstrated financial need, with preference for incoming first-year students who have participated in varsity athletics, and have demonstrated outstanding leadership and involvement in their high schools and communities.

The Zaharchuk Family Scholarship was established in 2001 by John J. and Susan Haines Zaharchuk, both members of the Class of 1981. The scholarship shall be awarded to students with demonstrated financial need, with preference given to students from southeastern Pennsylvania.

The Herman E. & Gertrude J. Zehner Memorial Scholarship was established by Betty J. Zehner in memory of her father, Class of 1913, and her mother. Preference for the scholarship award will be given to students majoring in chemical engineering or chemistry, who participate in athletics on the varsity, club, intramural or recreational level, and are in good academic standing.

The John F. & Martha H. Zeller Scholarship was established in 2005 by the Charles B. Degenstein Foundation and its officers. The scholarship honors John F. Zeller III, a member of Bucknell's Class of 1941, acting president and longtime senior administrator and general counsel for Bucknell University, and his wife, Martha H. Zeller, a valued member of the Bucknell family. The scholarship shall be awarded to students without restriction.

The Zobel-Elizalde '17 Scholarship was created by gifts from Sofia Zobel-Elizalde and Francisco R. Elizalde in honor of their son, Francisco "Patxi" Zobel Elizalde, Class of 2017. Grants shall be made to students based on financial need, with preference given to international students from South East Asia or other foreign countries.

The Susan Penecale Zolla Scholarship was established in 2000 by Susan P. Zolla, Class of 1968, and her husband, Edward M. Zolla. The scholarship shall be awarded to students with demonstrated financial need, with preference going to students from the west coast who graduated from a public high school.

Funds

Additional Funds

The Warren G. Abrahamson II Fund for Evolutionary Biology & Ecology was established to honor Warren “Abe” Abrahamson on the occasion of his 2011 retirement from teaching, by colleagues, former students, fellow researchers and other friends. The fund supports teaching, learning, research and scholarship at Bucknell in the fields of ecology and evolutionary biology, as well as their application in the fields of environmental studies and conservation.

The Alumni Association Board of Directors Endowment was established in 2004 by the board of directors of the Alumni Association of Bucknell University and Bucknell University. Income from the fund shall be used to support the mission of the Alumni Association: “To be an active and effective advocate for alumni in order to promote and enhance Bucknell.”

The Arias Family Bucknell Public Interest Program (BPIP) Internship Fund was established in 2005 by Louise and Robert Arias, parents of Andrew Arias, Class of 1999. The fund shall support internship opportunities through the Bucknell Public Interest Program.

The Arnao Watt Family Fund for Residential Colleges was created by gifts from Charles L. Arnao '70 and Rosemary A. Watt, dedicated parents of Andrew C. Arnao, Class of 2014. Income from the fund will support special activities, such as student travel, which are designed to enrich student experiences associated with the Residential Colleges program.

The BEAA Transformative Engineering Education Fund was established as an endowed fund with gifts from members of the Bucknell Engineering Alumni Association and other donors. Income from the fund supports transformative educational experiences in the College of Engineering. The goal is to provide undergraduate students with opportunities to participate in important and enriching education programs. The fund will provide flexibility to the College of Engineering to be responsive to student needs and take advantage of emerging educational activities while leveraging the input and guidance of engineering alumni.

The Bachman Fund for Faculty Advisors was established as an endowed fund with gifts from Trustee Jeb Bachman and Sally Bachman, Class of 1978. Income from the fund will be used by the University to provide grants for faculty advisers of student fraternities and sororities in support of their direct interaction with student leaders of these organizations.

The Balakian Fund for the Arts was created with gifts from the Balakian Family Foundation to provide high impact off-campus experiences in the arts for students studying art and art history, music and creative writing. The fund will support student research, travel, work experiences and participation in summer workshops. The fund honors the strong Bucknell legacy of the Balakian family, whose members include: Arax Balakian, Class of 1948; G. Peter Balakian, Class of 1973; James Diran Balakian, Class of 1978; Janet Nafena Balakian, Class of 1983; and James Gerard Balakian, Class of 2010.

The Beavers Internship was established by Thomas Gessner and the trustees of the Beavers Charitable Trust. The income from the fund will be used to support the civil engineering faculty in taking students to visit various construction projects during the spring semester of their junior year.

The Rowland E. Bell '59 Entrepreneurship & Innovation Fund was created by gifts from Rowland E. Bell, Class of 1959. Income from the fund supports entrepreneurship and innovation programs and associated activities for students.

The Milton & Eleanor Berelson Judaica Collection Endowment was established in 1988 by Stuart E. Berelson, Class of 1959, and others to honor his parents' lives and commitment to education. Income from the endowment may be used to acquire books and other library materials in the field of Jewish studies, to increase awareness of the contributions of the Jewish experience, enhance the appeal of Bucknell to students of the Jewish faith, and to support programs and activities that promote the use of the collection.

The Berkley Family Emergency Fund was established as an endowed fund with gifts from Evan and Andrea Berkley, Class of 1996. Income from the fund supports the Dean of Students Emergency Fund, a program operated by the Dean of Students Office to support students whose families are experiencing unexpected financial hardship or students who need assistance in the event of a family emergency.

The Ellen Clarke Bertrand Library Fund was established with a bequest from the estate of Ellen Clarke Bertrand. The income derived from this fund is used to support the acquisitions, operations and maintenance of the library, and its provisions of services and materials to Bucknell’s academic community.

The William P. Boger Jr., M.D. Faculty Award was established in 2006 by William P. Boger Jr., M.D., Class of 1934, in Dr. John Rice’s memory and shall be awarded to a faculty member in the sciences who has demonstrated excellence in teaching and scholarship.

The Boyer Family Fund was created by gifts from Blair A. Boyer, Class of 1983, and his wife, Elizabeth, dedicated parents of Eliza Boyer, Class of 2016, and Sonia Boyer, Class of 2018. Income from the fund will support management education, with preference for supporting experiential learning opportunities and curriculum development projects that benefit both management and non-management majors.

The Edward McKnight Brawley Endowment was established in 2008 by the Black Alumni Association and Bucknell University. Income from the fund shall be used to assist students who have been historically underrepresented in activities such as tutorials, workshops, research opportunities and internships so that they may pursue those activities.

The Lauren P. Breakiron Technology & Management Fund was established by Lauren P. Breakiron, Class of 1952. Income from the fund shall be used to support interdisciplinary programs or activities that integrate engineering and management education in ways that provide a more holistic perspective on complex corporate problems involving technology.

The Lucy Bridy Fund for the Support of the Student Managed Investment Fund was established as an endowed fund with gifts from Joseph Bridy, Class of 1998, to honor his grandmother's commitment to education. Income from the fund supports faculty, research, teaching and conduct of student investments in the University's endowment through the Student Managed Investment Fund program.

The Gladys Brooks Special Collections Library Endowment was established for the acquisition of books and periodicals in support of special new curricular programs or newly emerging areas of faculty interest.

The Bob Bryson and Rick Strouse Wrestling Fund was created by gifts from Bob Bryson and Rich Strouse, both Class of 1978. Income from the fund is intended to assist the men's varsity wrestling program to compete at the highest possible level.

The Bucknell Athletics Leadership Institute was funded by gifts from Emeritus Trustee William D. Dearstyne, Class of 1962, and his wife, Elizabeth. Income from the fund supports a comprehensive learning initiative designed to identify, develop and challenge student-athletes in their continued quest to become leaders in academics, in athletics and in life.

The Bucknell Community Engagement Fund recognizes Wayne Bromfield's distinguished career of service to Bucknell University and the people of Lewisburg and Central Pennsylvania. The fund will support Bucknell activities in the Lewisburg area that improve our region and strengthen the University's relationship with the community.

The Bucknell University Endowment for Men's Lacrosse was established by the men's lacrosse team alumni, family and friends in honor of Sid Jamieson, longtime coach of Bucknell's men's lacrosse team. Income from the fund shall be used to support the men's lacrosse program.

The Bucknell University Varsity Swimming & Diving Endowment was established in 2011. The fund supports and advances Bucknell's men's and women's swimming and diving teams by providing resources that may be used by the teams for travel for national or other postseason competition, recruiting or training; support for assistant coaches; or other needs that may arise.

The Janice Butler Fund for Service-Learning was created by gifts from anonymous alumni donors in honor of Janice Butler, longtime director of the Office of Civic Engagement & Service-Learning at Bucknell. Income from the fund supports student service-learning opportunities.

The Douglas K. Candland Fund for Animal Behavior was created by gifts from Glen Tullman, Class of 1981, in honor of Professor Candland's years of service as a teacher, scholar and mentor. Income from the fund supports the animal behavior program.

The Douglas K. Candland Fund for Civic Action was created by gifts from Glen Tullman, Class of 1981, in honor of Professor Candland's years of service as a teacher, scholar and mentor. Income from the fund supports civic and community engaged learning activities.

The Douglas K. Candland Fund for the College of Arts & Sciences was created by gifts from Glen Tullman, Class of 1981, in honor of Professor Candland's years of service as a teacher, scholar and mentor. Income from the fund supports high-impact educational activities in the College of Arts & Sciences.

The Douglas K. Candland Fund for Faculty Advisors was created by gifts from E. Niles Wilcox, Class of 1973, in memory of Professor Candland's years of service as a teacher, scholar and mentor. Income from the fund provides support for faculty advising and mentoring of students in the College of Arts & Sciences.

The Canonica Family Water Polo Endowment was established in 2009 by Gregory A. and Robin C. Canonica to honor Kandis R. Canonica. The fund gives preference to support of the Bucknell women's intercollegiate water polo program and is intended to help the University's women's and men's programs to compete successfully at the highest possible level.

The Kandis R. Canonica Water Polo Fund was established as an endowed fund with gifts from Gregory A. and Robin C. Canonica in honor of their daughter, Kandis, Class of 2011. Income from the fund is intended to assist the University's water polo programs to compete at the highest possible level, with a preference for supporting the Bucknell women's varsity water polo program.

The F. W. "Bill" Carson '42 & Betty Thomas Carson '42 Tennis Endowment was established in 2000 by Betty Carson '42 and Bill Carson '42, a member and two-time captain of Bucknell's varsity tennis team. The fund shall be used to support the men's and women's varsity tennis teams.

The Joseph A. Ciffolillo '61 Healthcare Technology Inventors Program was established with gifts from Trustee Emeritus Joe Ciffolillo, Class of 1961, and his wife, Joyce Ciffolillo. Income from the fund will be used by the University to support student and faculty research involving the development and advancement of health care-related technologies.

The F. Michael Corrigan Men's Basketball Endowment was established under an agreement completed in 2006 by F. Michael Corrigan, Class of 1957. The fund supports Bucknell's intercollegiate men's basketball team coaches and is intended to help the team compete successfully at the highest level.

The Dalal Family Fund for Creativity & Innovation was established as an endowed fund with gifts from Yogen and Peggy Dalal, former members of the Parents Board and dedicated parents of Nina M. Dalal, Class of 2008. Income from the fund will promote creativity at Bucknell through faculty and student collaboration on innovative projects across the curriculum.

The Martha Sober Davis '45 Memorial Management Fund was established in 2007 by her brother, Charles T. Sober, Class of 1939, to honor her memory. The fund supports management education at the highest possible level by aiding the students, faculty and programs of the department of management.

The Dawson Family Fund for Counseling & Student Development was created by gifts from Peter and Christina Dawson, dedicated parents of Miles Dawson, Class of 2012. Income from the fund supports Bucknell's Counseling & Student Development Center services, including group therapy, alcohol awareness and intervention, and suicide prevention programs.

The Elizabeth T. & William D. Dearstyne Jr. Endowment for Classical Music Appreciation was funded by gifts from Emeritus Trustee Bill Dearstyne, Class of 1962. Income from the fund supports music appreciation activities for students, including but not limited to performance attendance by students or other activities associated with classical music and opera mainly from the western tradition. Income may also be used to support visiting artists or lecturers.

The Dixon Family Fund for Creativity, Arts & Innovation was established as an endowed fund with gifts from James and Tanja Dixon, dedicated parents of Caroline E. Dixon, Class of 2017. Income from the fund will promote creativity at Bucknell through faculty and student collaboration on innovative projects across curriculum.

The Ekard Resident Artists Fund was created with anonymous gifts to engage studio art students in master classes and studio art experiences with artists from outside the Bucknell community. Income from the fund will be used to further these engagement efforts, including but not limited to providing support for compensation, lodging and related expenses for visiting artists.

The Kathleen Ekedahl '79 Memorial Garden Fund was created by gifts from David D., Class of 1956, and E. Patricia Ekedahl, in memory of their daughter, Kathleen Ekedahl, Class of 1979. Income from the fund supports the maintenance and operating costs of the Kathleen Ekedahl '79 Memorial Garden.

The Endowment for Bison Men's Soccer was established in 2010 by a Class of 1980 member of the men's soccer team. The fund provides Bucknell's intercollegiate men's soccer program with resources to strengthen and maintain the competitive level of the program.

The Endowment for the Support of the Student Managed Investment Fund Faculty, Research & Programs was established in 2011 with gifts from anonymous parents. Income from the fund supports faculty, research, teaching and conduct of student investments in the University's endowment through the Student Managed Investment Fund program.

The Engineering Success Alliance Program Endowment was established under an agreement completed in 2011 and funded by gifts from George J. Pierson '84. The fund supports the Engineering Success Alliance program and is intended to provide resources to advance the work and goals of that program.

The Harold L. & Mary Louise Evans Memorial Fund for Women's Varsity Golf was established as an endowed fund with gifts from their daughter, Susan E. Evans, Class of 1964, to honor the memory of Harold L. and Mary Louise Evans. Both Harold and Mary Louise were involved with the Bucknell Golf Club from its beginning. Harold was affiliated with the University for more than 70 years, with the majority of those years as the resident golf professional. He was also the first intercollegiate golf coach for 25 years at Bucknell. Income from the fund will provide financial support to the women's varsity golf program at Bucknell.

The Jeffrey C. Evans Geotechnical Engineering Laboratory was established by Michael J. Costa, Class of 1991, and Laureen Leptinsky Costa, Class of 1990, funded through the Houston Endowment in honor of Professor Jeffrey C. Evans, who personifies Bucknell's teacher-scholar-mentor model. The fund supports equipment purchases, use and maintenance of the lab, and is intended to provide resources to advance student and faculty coursework, experimentation and research in geotechnical engineering.

The Fetterolf Family Fund for Men's Crew was established as an endowed fund with gifts from Donald L. and Linda K. Fetterolf, dedicated parents of Brian Scott Fetterolf, Class of 1993. Income from the fund will be used to support men's crew, including but not limited to coaches' compensation and benefits, and other expenses such as equipment costs, race-entry fees and team travel.

The Freeman College of Management Real Estate Program Endowment was created by gifts from several Bucknellians who have had successful careers in the real estate industry. This group of dedicated alumni and parents helped to create and build the real estate program in the Freeman College. Income from the fund supports the real estate program, including but not limited to real estate faculty salary and benefits, the curriculum, internal and external speakers, student travel and research, and other expenses necessary for the program's success.

The Kenneth W. Freeman Dean of the College of Management's Innovation Fund was established in 2008 by Bucknell Trustee Kenneth W. Freeman, Class of 1972, and his wife, Janice W. Freeman. The fund shall be used for the College of Management dean's innovation fund.

The Fritz Family Dean of Students Fund was created by gifts from Lance M. Fritz and Julie (Crenson) Fritz, both graduates from the Class of 1985. Income from the fund will be used by the University to support and enhance the health and wellness of all Bucknell students. The fund will support initiatives designed to create healthy lifestyles, including programs which connect students with each other, support their mental health, and assist with substance abuse struggles. The fund is designed to ensure all Bucknell students feel the support and connection needed to successfully complete their degrees.

The Rabbi Serena L. Fujita Social Justice Fund was created by gifts from Stuart E. Berelson '59 and others to honor Rabbi Fujita at her retirement as Bucknell's first full-time Jewish chaplain. As a reflection of her lifetime interests and actions and at her direction, the fund serves to support campus education and experience in social justice issues, as integral to the teachings of Judaism.

The Fund for Men's Basketball Excellence was created by gifts recommended by Brenda Earl, Class of 1981. Income from the fund shall be used to recruit and retain men's basketball varsity student athletes in compliance with any rules and regulations set forth by governing bodies.

The Eugene A. & Suzanne H. Gorab Endowment was established in 2008 by the Eugene A. & Suzanne H. Gorab Foundation, and Eugene A. Gorab, Class of 1985. Expenditures from the fund are unrestricted and shall be used for the general purpose of the University.

The Graham Building Operations & Maintenance Fund was established as an endowed fund with gifts from Trustee William A. Graham IV, Class of 1962. Income from the fund supports the operations and maintenance of the Graham Building.

The William A. Graham IV Women's Varsity Athletics Endowment was established in 2004 by William A. Graham IV, Class of 1962. The fund is intended to support equitable opportunities for all coaches and athletes participating in University women's varsity athletic programs, regardless of chosen sport.

The William A. Graham IV Wrestling Endowment was established in 2004 by William A. Graham IV, Class of 1962. The fund supports Bucknell's intercollegiate wrestling program and is intended to enable it to compete successfully at the highest possible level.

The Tom Greaves Fund for Research & Curricular Development was established by Tracy Meerwarth Pester, Class of 1996, and her mother, Lurenna M. Meerwarth, in honor of Thomas C. Greaves, professor emeritus of sociology and anthropology. Income from the fund supports research and curricular development in the Department of Sociology & Anthropology, including but not limited to students conducting research with faculty, student/faculty conference travel, local and international fieldwork, curricular development and seed funding for pilot projects. The fund's goal is to advance students' understanding of the work of anthropology and sociology by actively involving them in research.

The Frederic & Linda Greenberg Fund for Jewish Life & Learning was established in 2000 by Linda Garrett Greenberg, Class of 1963, and her husband, Frederic Greenberg. The fund shall be used to nurture the life of the Jewish community at Bucknell and to deepen the understanding of Jewish thought, history and traditions among students of all faiths.

The Art Gulden Cross Country and Track & Field Endowment was established in 2002 by alumni and supporters of the cross country and track and field programs in honor of Coach Art Gulden on his 30th anniversary at Bucknell. Coach Gulden touched the lives of many of Bucknell's finest athletes as head coach of the cross country and track and field programs, teaching the value of hard work, dedication to achieving goals and teamwork. Income from the fund shall be used to support the cross country and track and field programs.

The Douglas B. Hall '91 Memorial Endowment for Outdoor Experience was established in 2006 by his parents, Gerald '63 and Nancy Hall, and other friends to remember Doug and honor his spirit of adventure. Expenditures will be made from the fund to provide assistance for Bucknell students enhancing their undergraduate or graduate educational experience by participating in activities such as rock climbing, spelunking, cross country skiing, hiking, canoeing and kayaking, or other adventurous activities. Eligible expenditures of the fund include the purchase of related equipment and supplies, training classes, group activities, and related travel and sundry expenses.

The Healthcare Research & Design Fund was established by Michael J. Costa, Class of 1991, and Laureen Leptinsky Costa, Class of 1990, to provide financial support for health care-related research and technology development projects directly involving undergraduate students in the College of Engineering. Income from the fund will directly support student participation in science and engineering research and design through student stipends, materials, supplies and laboratory equipment for health care-related projects. The fund is designed to enhance student opportunities and leverage additional support for health care research and medical device development in the College of Engineering.

The Herring Family Fund was created by gifts from James and Kathy Herring, dedicated parents of Lucy C. Herring, Class of 2019, and Margaret C. Herring, Class of 2021. Income from the fund will support management education, with preference for supporting experiential learning opportunities and curriculum development projects.

The Terry J. Hibbard Mechanical Engineering Endowment was established by Terry J. Hibbard, Class of 1971. Income from the fund supports the students, faculty, programs and facilities of the Department of Mechanical Engineering and is intended to enable the mechanical engineering program to educate students at the highest possible level.

The Hoover Fund for Undergraduate Math Research was established as an endowed fund with gifts from John C. Hoover, Class of 1982. Income from the fund supports undergraduate research opportunities for students in math.

The James D. Hostetler Outdoor Education & Leadership Fund was created by gifts from Benard A. Sampson, Class of 1969, and parent of Molly Sampson Rege, Class of 1996, in honor of Jim Hostetler's longtime dedication and service to the Outdoor Education & Leadership program. Jim's passion for nature and outdoor pursuits, such as rock climbing, mountaineering, backpacking, paddling, hiking and road biking to name a few, has inspired countless students to become leaders in their chosen fields. Jim has worked with many Bucknell presidents, provosts and faculty to solidify the Outdoor Education & Leadership program's place at the University, and he is affectionately known as "El Jefe" (the Chief) to students and alumni, who share the same dream of continuing the program's success. Income from the fund supports expenses related to enhancing the Outdoor Education & Leadership program, including but not limited to a speaker/film series, programming, activities, equipment, student travel and research, and collaboration with other Bucknell programs.

The Diane L. Hymas Undergraduate Research Fund in Engineering was established by a gift from Diane L. Hymas, Class of 1979, in honor of her parents, Donald G. and Audrey F. Hymas, and her children, Heidi C. Dybeck, Class of 2009, and Eric C. Dybeck, Class of 2011. Income from the fund supports summer undergraduate research opportunities for students in engineering.

The Christian A. Johnson Endeavor Foundation Curriculum Development Fund was established to support interdisciplinary course and program development within the College of Arts & Sciences.

The Kalman Fund for Jewish Life & Learning was established in 1999 by Ernest M. Kalman ’56 and his wife, Joan. The fund shall be used to nurture the life of the Jewish community at Bucknell and to deepen the understanding of Jewish thought, history and traditions among students of all faiths.

The Walter M. & Melinda Kelly Family Fund for Water Polo was created by gifts from Walter M. Kelly, Class of 1992, and Melinda Kelly. Income from the fund supports the operations and expenses of the varsity men's and women's water polo programs, including but not limited to, salaries for coaches, assistants and aids; travel; support services; equipment, facilities and capital needs.

The Kiken Family Wine Studies Endowment was established in 2009 by Norman P. Kiken, Class of 1964, honoring the memory of Evelyn Kiken. The fund provides experience tasting, using and enjoying wine so that participants will be better able to enjoy, understand and use a wide variety of wines in personal and professional settings.

The Richard A. Klein Theater & Dance Production Endowment was established in 2006 by Richard A. Klein, Class of 1969. The fund supports the creative experience and education of Bucknell students by underwriting theatre and dance performance and production to involve students under the oversight or direction of the faculty of the Department of Theatre & Dance.

The Kohn Family Real Estate Program Fund was created by gifts from Steven A. Kohn, Class of 1981, and his wife, Yvette V. Kohn. Income from the fund supports the Freeman College of Management's real estate program, including but not limited to real estate faculty salary and benefits, the curriculum, internal and external speakers, student travel and research, and other expenses necessary for the program's success.

The Benton & Carol Kribbs Memorial Men’s Basketball Awards Program Endowment was established in 2011 by Robert and Sharon Kribbs to honor Benton and Carol Kribbs. Benton Kribbs served as Bucknell’s men’s basketball coach from 1952-1962 and as director of athletics from 1962-1968. The fund is intended to support the awards and annual banquet for the Bucknell University men’s basketball program.

The George M. Kunkel Memorial Equipment Fund for Mechanical Engineering was established to support equipment purchased by the mechanical engineering department.

The Charles J. & Isabelle Kushell Music Endowment Fund was established by Charles J. and Isabelle Kushell, of Chicago, Ill., graduates of Bucknell University in the Classes of 1927 and 1926, respectively. The purpose of the fund is to augment both the instructional and the performance offerings of the Department of Music of Bucknell University by providing funds for bringing to the campus professional musicians, distinguished scholars, performing artists or music educators of nationally recognized merit.

The Robert A. Latour Varsity Swimming & Diving Endowment was established in 2002 by William D. Dearstyne ’62 to honor Bucknell’s former head swimming and diving coach, Robert A. Latour, by supporting the University’s Robert A. Latour Head Swimming & Diving Coach, and the University’s varsity swimming and diving program.

The Lattal Family Opera Endowment was established in 2009 by Frank A. and Gretta M. Lattal in memory of Frank and Ann Lattal. The fund is intended to enhance Bucknell’s opera program by increasing the resources available for its faculty, staff, students, performances, staging, outside experiences, extraordinary adjunct education, and in other ways that enhance opera education and performance.

The Leinbach Family Library Fund was established by Annabelle Rich Leinbach in honor of her son, Paul W. Leinbach, Class of 1954, and her daughter-in-law, Jeannette Grove Leinbach, Class of 1955. The income derived from this fund is used at the discretion of Bucknell’s head librarian for acquisitions or other purposes related to the provision of services and materials to Bucknell’s academic community.

The Leslie Family Fund for Economics was created by gifts from Reid and Kris Leslie, Class of 1986, dedicated parents of Michael S. Leslie, Class of 2017. Income from the fund shall be used to support the economics department, including but not limited to curriculum development, student and faculty travel, conference expenses, program enhancement, guest speakers and scholarship.

The Library Technology Fund was established in 1999 by a member of the Class of 1980. The income derived from this fund is to be used at the discretion of the chief administrator of the University's library to keep the library current with changing technology.

The J. Wesley Little Memorial Art Fund was established in 1985 by Dr. Thomas M. Little, Class of 1931, in memory of his father, J. Wesley Little. Income from the endowment is to be used for the exhibition and acquisition of regional art.

The Dorothy "Bugs" Harvey Lloyd '53 Field Hockey Endowment was established by family and friends in memory of Dorothy Harvey Lloyd, Class of 1953. The endowment shall benefit the Bucknell women's varsity field hockey program.

The MacDonald Family Fund for the Institute for Leadership in Technology & Management was established by J. Randall and Kathleen MacDonald of Greenwich, Conn. Income from the fund shall be used at the discretion of the co-directors of the Institute for Leadership in Technology & Management. This income may be used to support any or all of the following components of the program: faculty salaries, program enhancement, support for guest speakers, student stipends or curriculum development.

The Malloure Family Engineering Excelerator Fund was created by gifts from Mike Malloure, Class of 1998, and Julie (Kimball) Malloure, Class of 1998. Income from the fund supports the College of Engineering's programming to support underrepresented students within the College of Engineering.

The Management Scholars Endowment was created by gifts from Robert C. Puff '67, GP'25, GP'27 and Nancy Puff '69, GP'25, GP'27. Income from the fund supports the Freeman College of Management efforts to recruit and retain exceptional students through mentoring and significant experiential learning opportunities.

The Mildred A. Martin Fund for Poetry was established by Miss Martin, a Bucknell faculty member from 1940-1972. Income from the fund will be used to promote the writing, study and teaching of poetry, and for support of the programs and facilities of the Poetry Center.

The Kimberly Jo McClymont '90 Fund was established with gifts from Connie L. Tressler, Class of 1962. Income from the fund supports the psychology, animal behavior and neuroscience programs. The fund serves as a memorial honoring Connie's daughter, Kimberly Jo McClymont, Class of 1990.

The William C. McMurray Accounting Fund was established by William C. McMurray, Class of 1946, to support travel in the accounting program, especially travel by professors.

The John Miller MG 101 Program Endowment was established by his students in honor of John Miller. The fund supports and is intended to provide resources to advance the MG 101 experience.

The Vivian Miller Fund for English was established under an agreement completed in 2002 and funded by a gift from Vivian Miller, mother of Amy P. Miller, Class of 1989. Income from the fund shall be used to support the Bucknell English department's efforts to enhance the artistic and intellectual atmosphere of the University.

The Miss Zareen Taj Mirza Bucknell Endowment was created by gifts from Zareen Taj Mirza, Class of 1979. Income from the fund shall be used to further first and second-year students' interest in programs and departments that were especially meaningful to Miss Mirza during her enrollment at Bucknell.

The Moriarty Fund for the College of Management was created with gifts from J.D. Moriarty, Class of 1994. The fund shall be used to support the Moriarty Investment Center, which was established by Emeritus Trustee Virginia Moriarty in honor of the late Edmond N. Morriarty Jr., a former trustee.

The Tim Nesvig '96 Memorial Athletic Awards Program Endowment was established in 2010 by the family of Timothy W. Nesvig, a member of Bucknell's Class of 1996, and Honorable Mention All-American member of Bucknell's varsity men's water polo team. The fund is intended to support recognition events, programs and awards for Bucknell's student-athletes.

The Bob Odell Head Football Coaching Endowment was established by Norman E. Garrity '63 and Mary Lou Roppel Garrity '64 to honor Bucknell's former head football coach, Robert Odell. The endowment is intended to provide perpetual budget support for the head football coach.

The O'Keeffe Family Fund was created with a gift from Peter R. O'Keeffe, Class of 1972. Income from the fund supports the programmatic needs and objectives of Bucknell's Posse Program. The program assists students with extraordinary academic and leadership potential who may have been overlooked by the traditional college selection process. Students receive training in leadership, team-building, communication and academic excellence.

The Oliver/Walters Family Endowment for Mechanical Engineering was established by Richard E. Oliver, Class of 1970; his wife, Christine S. Oliver; his son, Stephen S. Oliver, Class of 2003; his daughter, Wendy Oliver Walters, Class of 1994; and his son-in-law, Russell H. Walters, Class of 1993. The fund shall be used to support student projects, field trips and other activities that directly involve and benefit students in the mechanical engineering degree program.

The Teresa Pavlin Music Department Fund was created by gifts from Teddy Pavlin, Class of 1975. Income from the fund supports the music department, with preference for supporting educational opportunities, including but not limited to faculty led student trips, student-initiated research, professional development and conference attendance for faculty and students, and intensive faculty/student collaborative experiences.

The W. Guy Payne Fund was established by W. Guy Payne, Class of 1909, to help defray the expenses of students who attend religious conferences.

The Perricelli-Gegnas Center for Entrepreneurship & Innovation Endowment was created by gifts from Scott Perricelli, Class of 1994, and Susan Perricelli, Class of 1994. Income from the fund supports the operating expenses of the Perricelli-Gegnas Center for Entrepreneurship & Innovation.

The Earle B. Pierson Jr. Fund was established by a testamentary gift from Ada T. Pierson, wife of Earle B. Pierson Jr., Class of 1938. The fund will be used to support the general purpose of the University.

The President's Discretionary Fund was funded by the Eugene A. & Suzanne H. Gorab Foundation to provide financial support for special projects and initiatives that the University's president determines warrant strategic resources.

The PricewaterhouseCoopers Research Fund was established in 2008 by John E. "Jeb" '78 and Sara S. "Sally" Bachman '78, with a preference for accounting faculty, for research, associated travel, professional development and student scholarship.

The Rasmussen Family Fund for the Institute for Leadership in Technology & Management was funded by gifts from Warren and Nancy Rasmussen, dedicated parents of Karen L. Rasmussen, Class of 1979. Income from the fund shall be used at the discretion of the University for the Institute for Leadership in Technology & Management and may be used to support any or all of the following components of leadership in technology programs: faculty salaries, program enhancement, support for guest speakers, student stipends or curriculum development.

The Reserve Officers Training Corps Scholarship Program was established by the United States Congress by enactment of the ROTC Vitalization Act of 1964. Through this act, one, two or three-year scholarships are awarded to students who have distinguished themselves academically at Bucknell and who may be considering a military career.

The Robbins Family Farm Fund was created by gifts from Richard K. Robbins, Class of 1970, and Nancy P. Robbins, in support of the Bucknell Farm. Income from the fund will be used for the farm's general operations and expenditures, including but not limited to equipment, facilities, agricultural or other supplies, educational programming, activities, student internships, staff salaries and benefits.

The Rooke Chapel Organ Assistants Fund was established by Natalie D. and Robert C. Rooke, the income to be awarded to one or more students taking organ lessons and/or working with the chapel organist to provide music for chapel functions.

The Philip Roth Book Fund was established through gifts from the estate of Philip Roth, Class of 1954. Mr. Roth graduated with a B.A. in English and achieved much literary fame as a prolific author of American literature. He received an Honorary Doctor of Humane Letters from Bucknell in 1979. Income from the fund will be used by the Ellen Clarke Bertrand Library to purchase books and/or other materials or formats in American history, biography and politics.

The Rothschild/Johnson Art Experience Endowment was established in 2005 by Richard Rothschild '78 and his wife, Barbara, and Leslie Knox Johnson '83, in memory of Van Johnson '77. The endowment provides support for students, selected by competition, to explore the visual arts in New York City or other locations.

The James A. Russell Memorial Fund was established by James R. Russell in memory of his son, James A. Russell, Class of 1967. The fund shall be used for the acquisition of books, periodicals and other instructional materials for the Bertrand Library. In addition, the fund shall be used to support exhibitions that are scheduled in the special collections exhibit area of the Bertrand Library, which has been named in memory of his son, James A. Russell, Class of 1967.

The Jean Russell Fund for STEM Students was created by gifts from Jean Russell to help students realize their potential to succeed in STEM disciplines (including science, technology, engineering and mathematics). Income from the Fund provides support for students before and after they have started their undergraduate enrollment, to participate in research with faculty, work with student and faculty mentors, and in other ways that help secure their success in STEM fields, both before and after graduation.

The Russell Endowment was established in 2009 by Daniel R. '78 and Christine Peterjohn Richards '76 to provide a lasting memorial honoring the lifetime contributions of Coach Dick Russell to Bucknell's varsity water polo and swimming programs. The fund provides resources to support Bucknell's coaches, teams and athletes in men's and women's varsity water polo.

The William D. Schaeffer Jr. '70 Fund for Healthcare Technology Development was established with gifts from William D. Schaeffer Jr., Class of 1970. Income from the fund will be used by the University to enhance the educational experience for students by supporting the development of student and faculty medical technology projects, including collaborative, multidisciplinary and cross-institutional projects, and where appropriate, support the intellectual property protection of worthy health care-related products or technologies.

The Schlegel-Deibler Memorial Endowment was established by Richard LaMar Schlegel in memory of his parents, Roy F. and Margaret Deibler Schlegel. The fund supports staffing, programming and activities that foster a supportive environment in which gay/lesbian/bisexual students, as part of their education, can confidentially and in an atmosphere of tolerance, explore their identities. Further, the fund supports University outreach into related non-gay agendas.

The Schotz Family Fund was established as an endowed fund with gifts from Jon Schotz P'11, Patricia Wheeler P'11, and Katherine Wheeler Schotz, Class of 2011. Income from the fund supports faculty and student work in interdisciplinary studies.

The Sergeant-Soto Family Management Fund was created by gifts from Cristina L. Soto '94, P'25 and Scott C. Sergeant '95, P'25. Income from the fund supports the strategic goal of recruiting and retaining a diverse community of scholars in the Freeman College of Management.

The Silverman Family Real Estate Program Endowed Fund was created by gifts from Blake and Tracy Silverman, Class of 2005. Income from the fund supports the Freeman College of Management's real estate program, including but not limited to real estate faculty salary and benefits, the curriculum, internal and external speakers, student travel and research, and other expenses necessary for the program's success.

The Todd Singleton '88 & Lisa Mascolo Fund was created by gifts from Todd Singleton, Class of 1988, and Lisa Mascolo. Income from the fund will support management education with preference for those student course activities that promote experiential organization and management education.

The John Skotedis Memorial Men's Crew Head Coaching Endowment was created through a grant from The David R. Clare and Margaret C. Clare Foundation.

The Robert E. Slonaker Jr. Memorial Fund was established in 2009 by his wife, Gloria Slonaker, Class of 1956, former colleagues, students and friends of Professor Slonaker. The fund honors the memory of Robert E. Slonaker Jr., a member of the Class of 1956 and a longtime member of the chemical engineering faculty. The fund provides an annual prize to a distinguished graduating senior chemical engineering student who has demonstrated outstanding achievement within the field of materials science and engineering, and supports the Department of Chemical Engineering, especially through funding research conducted by undergraduate chemical engineering majors.

The Frederick Arthur Snell Music Endowment was established in 2005 by Frederick E. Snell, Class of 1965, in honor of his father, a graduate of the Class of 1943. The fund supports Bucknell's music department.

The Gary A. & Sandra K. Sojka Equipment & Instrumentation Fund was established in 1998 by Bucknell's 13th president and his wife, Gary and Sandy Sojka, in support of faculty research in the life sciences. Income from the fund shall be used to purchase laboratory equipment, instrumentation and supplies for research undertaken by faculty members and their associates in the Department of Biology.

The Gary A. & Sandra K. Sojka Fund for Research, Teaching & Scholarship in Developmental Disabilities, Neuroscience & Human Health was created by gifts from Gary A. and Sandra K. Sojka. Income from the fund will be used to support human health research, teaching and scholarship, including cross-disciplinary and cross-institutional projects conducted by Bucknell faculty and students. Areas of focus to be supported include, but are not limited to: neuroscience, developmental disabilities, pediatric and adolescent mental health, psychology and other related fields. Support from this fund may be used for cross-institutional projects conducted with Geisinger Health System or other health care providers who may be engaged with Bucknell faculty and students. The fund honors Bucknell's 13th president and his wife, both of whom are engaged supporters of the intellectual, social and cultural life of the Bucknell community.

The Sandra & Gary Sojka Visiting Poet Series in the Stadler Center for Poetry at Bucknell was inaugurated in 1995. Established through the generosity of the former president of Bucknell University and his wife, the series consists of a short visit by a distinguished poet during the fall semester each year. While on the campus, the poet offers a poetry reading, meets informally with those interested in conversation about the writing of poetry, and visits a poetry-writing workshop. The series is designed to contribute to the development of young writers, while it also enriches the life of the University as a whole and of the larger community.

The Jack & Ralynn Stadler Poetry Endowment was established in 1980 by Jack Stadler, Class of 1940, and his wife, Ralynn, in recognition of the power of poetry and the importance of poetry's role in the cultural landscape. The endowment supports the activities and programs of the Stadler Center for Poetry.

The Gordon & Joan Stetz Management Endowment was established by Gordon M. Stetz, Class of 1983, and Joan M. Stetz, Class of 1980. The fund supports students, faculty and programs within the discipline of management.

The Francis D. Stillman '60 Bucknell Public Interest Program (BPIP) Internship Fund was established in 2005 by Francis D. Stillman Jr., Class of 1960. The fund shall support internship opportunities through the Bucknell Public Interest Program.

The Stroup Family Fund for Conscious Awareness was established as an endowed fund with gifts from Catherine J. Stroup, Class of 1983, and her husband, Chris Stroup. Income from the fund will be used by the University to support academic and student-life programs that promote mindfulness and conscious awareness at the University, including stress-relief programs that focus on health and wellness, meditation or courses on mindful behaviors.

The Student Management Investment Endowment was established in 2011 with gifts from anonymous parents. Income from the fund supports faculty, research, teaching and conduct of student investments in the University's endowment through the Student Managed Investment Fund program.

The Robert F. Sykes '47 Engineering Endowment was established in 2009 by alumnus Robert F. Sykes, Class of 1947. The fund supports the development of innovative curricular programs in the College of Engineering, with particular emphasis on the first and second-year programs and other programs in support of student retention in the College of Engineering.

The Teacher Education Fund supports initiatives intended to improve the preparation of the next generation of teachers.

The Rita Bergner Terry '63 Library Fund was established in 2011 by Lynne Hooper in memory of her mother, Rita Bergner Terry, a member of the Class of 1963, and a faithful supporter of the University and Bertrand Library. The fund provides support for Bertrand Library.

The Isaac Tressler Fund for Astronomy was established by Isaac J. Tressler, Class of 1940, father of Connie Tressler '62 and Lloyd E. Tressler '63, and grandfather of Kimberly J. McClymont '90. Income from the fund shall be used to support the study of astronomy at Bucknell University.

The Leanne Freas Trout Fund for Research & Teaching French & Francophone Studies was established in 2012 with a gift from Leanne Freas Trout, Class of 1950. The fund supports faculty academic projects and travel to enhance research, scholarship and teaching; lectureships and residencies for visiting scholars; research and travel for faculty-student collaborative work; and need-based grants to students for off-campus participation in the French & Francophone studies programs.

The James H. & Elizabeth F. Turnure Purchase Fund for the Gallery was established in 1994 by James H. and Elizabeth F. Turnure. Income from the fund shall be used to support the acquisition, stewardship and access of examples of western art and related artifacts created before the year 1900 A.D., with Egyptian, Mesopotamian, Aegean, Greco-Roman and Renaissance art and artifacts given priority.

The Vizas Family Fund was established in 2006 by Kathryn Vizas, Class of 1979, and her husband, Robert Vizas. Income from the fund shall be used to support the programmatic needs of Bucknell's Posse Program. The program assists public high school students with extraordinary academic and leadership potential, but whom the traditional college selection process may overlook. Students receive training in leadership, team-building, communication and academic excellence.

The Waddell Family Men's Golf Fund was created by gifts from Frederick H. and Catherine M. Waddell, dedicated parents of Charlie Waddell, Class of 2007. Income from the fund is intended to assist the University's varsity golf programs to compete at the highest possible level, with preference for supporting the Bucknell men's varsity golf program.

The Fitz Roy & Mary Jane Walling Management Endowment was established in 2006 by Fitz Roy '46 and Mary Jane Walling. The fund supports management education at Bucknell, especially by funding the visits and lectures of scholars and experts in management to Bucknell students and faculty.

The Wattles Family Fund for Excellence in Management was created with gifts from Thomas G. Wattles P'06 '15 '19 and Joan G. Wattles P'06 '15 '19 in support of the Freeman College of Management. Income from the fund will provide support for the Student Managed Investment Fund faculty, research and programs, in addition to management programs of the greatest importance as determined by the dean of the Freeman College of Management or his/her designee.

The Wean Foundation Fund for Library Electronic Resources was established in 1999 by The Raymond John Wean Foundation. The income derived from this fund is to be used at the discretion of the chief administrator of the University's library for the acquisition of computer workstations and related hardware for the library to keep current with changing technology.

The Janet C. Weis Writing Program Endowment was established in 2011 by the estate of Janet C. Weis.

The Janet C. Weis Endowment for the Sigfried Weis Music Building was established in 2011 by the estate of Janet C. Weis.

The Janet C. Weis Performance Endowment for the Sigmund & Claire Weis Center for the Performing Arts was established in 2011 by the estate of Janet C. Weis.

The Sigfried Weis Endowment for the Performing Arts was established in 1995 by a bequest from the estate of Sigfried Weis, former chairman of Bucknell's Board of Trustees and longtime friend of the University. Income from the endowment is used to compensate artists performing in the Weis Center, and to maintain, renovate or improve the Weis Center facilities.

The Michael David Weiss Memorial Fund for Philosophy was created by gifts from Leon A. Weiss, Class of 1963, in memory of his son, Michael David Weiss, who was a strong advocate of the principles of Libertarianism. Income from the fund supports the Department of Philosophy, including but not limited to faculty and student scholarship, professional and curriculum development, teaching, programs and events.

The William M. '46 & Marion W. Wilkinson '43 Annual Fund Endowment was established by William M. Wilkinson, Class of 1946 and trustee emeritus, and Marion W. Wilkinson, Class of 1943, to perpetuate their annual gift to Bucknell University. Expenditures are unrestricted and shall be used for the general purposes of the University.

The Ellen P. & Samuel L. Williams Endowed Music Research Fund was created in 2009 through a bequest gift from Ellen Peterson Williams, Class of 1919, to honor the time she spent at Bucknell and the memory of her husband, Samuel L. Williams. The endowment provides funds to music faculty conducting research.

Student Research Funds

The Michael Baker Jr. Inc. Fund for Undergraduate Research in Civil & Environmental Engineering was established in 2000. The research stipends shall be awarded to undergraduate students conducting research in civil & environmental engineering, with preference given to students studying transportation systems.

The Bobko-Dennis Fund for Undergraduate Student Research was created by gifts from Dr. Philip Bobko, M.S. 1972, in honor of Russell E. Dennis, Bucknell professor of education from 1969 to 2012. Russ was a true academic and scholar-teacher who instilled his students with the passion and desire to think critically and logically. Income from the fund is dedicated to supporting undergraduate research opportunities for students majoring in psychology, philosophy, history or music.

The David Burpee Plant Genetics Fund was established in 1975 by David Burpee, retired president of the W. Atlee Burpee Company, who was a member of Bucknell's Board of Trustees. The income from the fund shall be used to provide research scholarships to encourage and prepare promising undergraduate students for advanced graduate studies and careers in plant genetics.

The Douglas K. Candland Undergraduate Research Fund was established in 1997 by Glen E. Tullman, Class of 1981, and his wife, Trish, to honor Professor Candland's years of service as teacher, scholar and mentor. The fund is designed to encourage imagination, innovation and the development of problem-solving skills among students majoring in the humanities and social sciences.

The Chemistry Graduate Research Fund was established under an agreement completed in 2000. Stipends from the fund shall be awarded as fellowships to MS graduate students conducting research in the Department of Chemistry. Research fellows will be selected by the chair of the Department of Chemistry upon recommendation by faculty members directing the research of the fellows.

The Culliton Family Fund for Undergraduate Research was funded by gifts from Stephen J. and Tracey D. Culliton, dedicated parents of Claire Kristen Culliton, Class of 2018. Income from the fund will be used to support summer undergraduate research opportunities for students.

The Dean's Fund for Summer Undergraduate Research in STEM was established by Michael J. Costa, Class of 1991, and Laureen Leptinsky Costa, Class 1990, in support of students who conduct summer research with a faculty member on campus. The preference is to provide support to students from traditionally underrepresented backgrounds who are pursuing education in a STEM (science, technology, engineering or math) field.

The Reed-Garman Award Fund for Engineering Entrepreneurship was established as an endowed fund with gifts from Robert F. Sykes '47. Named in honor of Professors John Clifford Reed and Warren De Witt Garman, income from the fund supports awards for students in engineering who have demonstrated the most promising entrepreneurial spirit and mindset. Awards will be made as stipends for an entrepreneurially-minded project to be conducted with the support of a Bucknell faculty member during the summer between the junior and senior years. Student recipients will be chosen by the dean of engineering and honored by the University annually.

The Stephen Glenn Hobar Memorial Research Award was established by Mr. and Mrs. Stephen Hobar and sons Donald, Jon, Robert and James in memory of their son and brother, Glenn, Class of 1975, who lost his life while wilderness backpacking. The award is to go to a student of chemistry who has completed the sophomore year to provide the student with an opportunity to do summer research with the intent of clarifying whether chemical research is the proper academic field for the recipient. The recipient will be selected by the chemistry department.

The John M. Hustler Undergraduate Research Fund was established in 2002 by John M. Hustler, Class of 1941. The research stipends shall be awarded to undergraduate students majoring in chemistry.

The Drs. Anthony & Joyce D. Kales Undergraduate Research Fund was established in 1984 by Dr. Anthony Kales and his wife, Dr. Joyce D. Kales, in recognition that student participation in independent undergraduate research is crucial for developing their ability to perform at the highest level as medical or other graduate students. The fund will provide support for research and publication opportunities for Bucknell students, particularly those working under the supervision of faculty members in the biology and chemistry departments.

The Kalman Fund for Biomedical Education was established in 1999 by Ernest M. Kalman, Class of 1956, and his wife, Joan, in recognition of the benefits that accrue to all people through advances in medical science. The fund makes possible faculty-mentored summer research through its Fellows Program, helps acquire and maintain equipment and instrumentation required in the study of the life sciences, and supports off-campus learning opportunities for exceptional Bucknell students. The fund is designed to support the work of undergraduates who plan to pursue post-graduate education, and through the support of activities that might not otherwise be available to enhance students' chances for acceptance into premier medical and graduate schools.

The Kalman Fund for Undergraduate Research in the Sciences was established in 1999 by Ernest M. Kalman '56 and his wife, Joan, in recognition of the benefits that accrue to all people through advances in the sciences. The fund makes possible faculty-mentored research projects in the sciences for exceptional Bucknell students.

The Wayne E. & Margaret S. Manning Internship in the Botanical Sciences was established through a bequest from Wayne E. Manning, professor emeritus of botany and member of Bucknell's faculty from 1945-1968, and his wife, Peg, who provided years of service to the collection. Awards from this fund shall be used for students engaged in summer research programs in the Department of Biology to encourage and prepare promising students for advanced graduate studies and careers in the botanical sciences.

The Dr. Glenn A. Moser '69 Chemistry Master's Research Fund was established with gifts from Dr. Glenn A. Moser. Income from the fund supports the chemistry master's degree program. The fund serves as a tribute to Dr. Bennett R. Willeford Jr., professor emeritus of chemistry, for his mentorship while Glenn attended Bucknell. It also honors Glenn's parents, Dr. Samuel H. Moser and Mrs. Samuel (Arlene S.) Moser, for their support, love and encouragement.

The PPL Utilities Undergraduate Research Fund was established by PPL Utilities in 1997. The research stipends shall be awarded to undergraduate students majoring in electrical engineering or management.

The James L.D. & Rebecca Roser Research Fellowship was established under an agreement completed in 2000 and funded with deferred gifts made by James L.D. Roser '50. Stipends from the fund shall be awarded as fellowships to undergraduate students conducting research under direction of faculty. The vice president for academic affairs or their successor will name research fellows on recommendation of the deans of the College of Arts & Sciences and the College of Engineering.

The Helen E. Royer Undergraduate Research Fund was established in 2008 by Dr. Helen E. Royer, Class of 1944, in appreciation for the research opportunities made available to her at Bucknell. The fund shall support faculty-mentored research projects by undergraduate students with demonstrated financial need.

The Juliet Shield-Taylor Fund for Undergraduate Research was established in 2003. First preference for research stipends shall be given to undergraduate students undertaking summer projects in the performing arts. Secondary preference shall be given to projects in the visual arts.

The Wendell I. Smith Internships in Psychology were established by gifts from former students, friends and colleagues of Provost Smith, Class of 1946, who, as a member of the Bucknell faculty from 1946-1986, served his academic discipline and his alma mater with distinction. The internships, awarded to students who show promise of doing distinguished work in the profession, provide opportunities to work with faculty members as teaching and/or research assistants in a program administered by the head of the department.

The Thomas R. Spitzer Undergraduate Research Fund was established in 1999 by Thomas R. Spitzer, Class of 1970. The research stipends shall be awarded to undergraduate students majoring in any academic discipline who wish to participate in a medically related research position in an off-campus environment.

The Tague Family Fund for Undergraduate Research in Biomedical, Biological & Biochemical Sciences was established in 2000. The research stipends shall be awarded to undergraduate students conducting research in studies concerning breast cancer.

The Fund for Undergraduate Research in Biological & Chemical Sciences was established in 1999. The research stipends shall be awarded to undergraduate students majoring in any biological or chemical science. Research fellows are selected by competitive application.

The Robert P. Vidinghoff Memorial Summer Internship was established by Raymond A. and Virginia Vidinghoff to preserve the memory of their son, Robert, Class of 1969. Awards from the fund will be used for students engaged in summer research programs administered by the science departments at Bucknell.

Lectureships

The Charles Martin & Elizabeth Stults Bond Lectureship on the meaning of religion was established in 1967 by colleagues, alumni and friends. It is filled from time to time upon the invitation of the Department of Religion by a person who has made significant contributions in the general area of religious interpretation, thought and action.

The Class of 1953 Lectureship was established by the class as a 25th Reunion gift to the University. Its purpose is to bring to the campus for a brief residency every other year one or more distinguished visitors representing a broad spectrum of interests and disciplines.

The Class of 1956 Lectureship was established in recognition of inspirational teaching. The lecture is to be given annually by a member of the faculty of Bucknell University. The committee that selects the recipient of this lectureship consists of the provost, deans, two faculty representatives and two student representatives.

The Ralph B. Derr Memorial Lectureship was established with funds from the estate of Ralph B. Derr, Class of 1917, in his memory. The speaker for the annual lecture will be a person of note from the field of chemical engineering, selected by the chemical engineering faculty to speak on an area of particular current interest in the profession.

The James A. Gathings Lectureship in International Politics, established in 1971 by students, colleagues and friends of Professor Gathings, annually presents a significant analyst in this field. The designated lecturer, to be selected by the Department of Political Science, shall possess a particular knowledge of international politics, with a concern for the political education of all regardless of academic training or specialty.

The O. V. W. Hawkins Lectureship was established by the Board of Trustees with funds provided by Mr. Hawkins, who was a trustee for many years. The lecture is to be in the field of public policy, but not limited to politics or government, and is to be given by a respected person of national prominence.

The Meerwarth Sociology & Anthropology Departmental Speaker Fund was established in 2006 by Tracy L. Meerwarth, Class of 1996, and her mother, Lurenna M. Meerwarth. The fund's goal is to enliven and enrich students' understanding of anthropology and sociology by bringing such external speakers' presentations to departmental classes, seminars and other events organized by the department. Topics may be academic and/or practitioner oriented, engaging students in current anthropological or sociological theory and/or practice.

The Putterman Lecture was established by Arnold L. Putterman, Class of 1960. The lecture is intended to address prominent current issues with a specific focus on politics, government and/or the economy.

The Harry Wolcott Robbins Lectureship was established in 1957 in honor of Harry Wolcott Robbins, John P. Crozer Professor of English and chairman of the Department of English from 1923-1954. Funded originally by the University and now endowed with a bequest from Mrs. Robbins, the lecture is given annually by a person who has made significant contributions to English and American literary scholarship.

The Roy Wood Sellars Lectureship commemorates the productive collaboration of Sellars, founder of the critical realist movement in American philosophy, and William Preston Warren, historian of the movement and editor of Sellars' writings. Initiated by Sellars, the lectureship was augmented by students and colleagues of Warren, former professor of philosophy at Bucknell. A distinguished scholar in American philosophy lectures annually.

The Ralph Spielman Memorial Lectureship was established by the relatives, colleagues, students and friends of Professor Spielman in memory of his service to the University from 1958 until his death in 1978. The lectureship emphasizes "Frontiers in Social Science" by bringing to the campus when possible, but at least every second year, a lecturer to describe promising attempts to interpret and open new fields in social science.

The Douglas Sturm Dialogue on Ethics & Social Justice was established in 1992 in honor of Dr. Sturm, who served Bucknell for more than 35 years as a teacher and scholar. The dialogue is intended to honor Dr. Sturm's substantive concerns with ethics and social justice issues and his commitment to the honest exchange of ideas on those matters.

The Virginia Travis Lectureship in Social Justice was endowed by her family and friends to commemorate her life and convictions. The lecturer ordinarily will be a member of the Bucknell or Lewisburg communities who has worked compassionately and diligently to promote justice and social change at the local, national or international level. The annual lecture will articulate a vision of justice and a strategy of social change to achieve it.

The Charles H. Watts II Humanities Institute was established in 2006 by the CTW Foundation and its officers to honor the memory of Charles H. Watts II, Bucknell's 11th president from 1964-1976, and a trustee from 1997-2001. The fund honors President Watts' love of the humanities, his dedication to learning and his exceptional leadership at Bucknell. The fund will provide annual support for the interdisciplinary study of a selected topic of interest in the humanities at Bucknell.

The Janet Weis Fellowship in Contemporary Letters, an award established at Bucknell University through a generous grant from the Degenstein Foundation in honor of Janet Weis. The fellowship honors and recognizes an individual who represents the very highest level of achievement in the craft of writing within the realms of fiction, nonfiction or biography. Each recipient of this fellowship is an author whose work has been accessible to a wide audience and has resulted in a broadly based record of public recognition and appreciation.

Student Prizes & Academic Awards

The following prizes and academic awards have been established, but no prize is given unless a high degree of merit is achieved. Awards from these funds shall be made in compliance with the University's policy of nondiscrimination.

The Alpha Chi Sigma Fraternity Prizes are awarded to the most deserving chemistry graduate chosen at the discretion of the chemistry department, and to the most deserving chemical engineering graduate chosen at the discretion of the chemical engineering department.

The American Chemical Society Undergraduate Award in Analytical Chemistry is awarded annually to a student who has displayed interest in and aptitude for a career in analytical chemistry during the first, sophomore and junior years.

The Stephen A. Barowsky Prize, established by friends of Stephen Barowsky and by the Barowsky family, in recognition of exceptional leadership qualities, to a student who has completed the junior year.

The Herbert Goodman Barrows Prizes were established by the Rev. William Barrows, A.M., Class of 1897, in memory of his son, for one or two seniors with the highest standing in, respectively, the Latin language and literature, and the Greek language and literature.

The William P. Boger Jr., M.D. Award was established in 2006 by William P. Boger Jr., M.D., Class of 1934, in memory of his parents, Ester Good Boger and William Pierce Boger, who in the depth of the Depression made so many personal sacrifices to make his education possible. The prize shall be awarded to an outstanding senior who has indicated a desire to spend their career in medicine or the biological sciences.

The Bucknell Prizes for Women were founded by William Bucknell and consist of:

- A prize for that woman of the graduating class who has the highest four-year average.
- A prize for that woman of the graduating class who, being excellent in scholarship during her senior year, shows the greatest proficiency in English composition and literature.
- A prize for that woman of the junior class who, being excellent in scholarship during her junior year, shows the greatest proficiency in English composition and literature.
- A prize for that woman of the sophomore class who, being excellent in scholarship during her sophomore year, shows the greatest proficiency in English composition and literature.

- A prize for that woman of the first-year class who makes the greatest advance in English composition and literature during the first year.
- The University offers similar prizes for men called the **University Prizes for Men.**

The Bucknell Prize in Women's & Gender Studies honors a graduating senior majoring in women's & gender studies for outstanding academic achievement.

The Bucknell University Prize in Art History, inaugurated in 2014 and given each year, is awarded to the member of the graduating class who has done the most outstanding work in art history.

The Bucknell Women's & Gender Studies Feminist Impact Award recognizes a women's & gender studies graduating major for academic achievement, significant contributions to the University and larger communities, and dedication to feminist principles.

The CBS/Sony Prize in Japanese Studies, established by CBS/Sony Inc., is awarded to a member of the graduating class who gives promise of further contributions to the understanding between Japan and the United States.

The Ernest & Josephine Christensen Award, established to honor Mr. and Mrs. Ernest Christensen, is given to an outstanding graduate in engineering.

The Class of 1905 Art Prize, endowed by Edith Kelly Fetherston in honor of the 50th Reunion of the Class of 1905, is given to the member of the graduating class whose work in creative art has been outstanding.

The David R. Crossgrove Prize, established by Sara Deck Crossgrove '28, is awarded to a senior pursuing a career in the legal profession who combines scholastic achievement and campus leadership with a strong code of ethics and a vision of attaining fairness in the legal profession.

The John R. Crossgrove Prize is awarded to a senior majoring in business or economics who combines scholastic achievement in the business curriculum with exceptional leadership qualities in the campus community.

The Walter M. & Florence K. Davis Prize was established in 2008 by Walter M. Davis, Class of 1947, and Florence K. Davis, Class of 1948. The prize shall be awarded to an outstanding senior graduating in religion.

The Eleanor D. Decker Prize for Women was endowed by Dr. Oliver J. Decker in memory of his wife; it is given to the woman of the graduating class who best represents the ideals fostered by Bucknell University: intellectual maturity, personal conviction and strength of character. The University offers a similar prize for men called the **University Prize for Men.**

The Oliver J. Decker Prizes were established by Oliver J. Decker, LL.D., Class of 1899, and consist of a prize for that member of the graduating class not in an engineering department who has attained the highest average, all courses having been taken at Bucknell University; and a prize for that member of the graduating class from the College of Engineering who has attained the highest average, all courses having been taken at Bucknell University.

Distinguished Military Graduate. A Distinguished Military Graduate selected by the professor of military science or by higher command is one who has been a Distinguished Military Student; who has completed the Advanced Course, Senior Division, of the Reserve Officers Training Corps; who is a member of the graduating class and is receiving a baccalaureate degree; and who has maintained the standards required of a Distinguished Military Student during the period between such designation and the date of graduation.

Distinguished Military Student. A Distinguished Military Student selected by the professor of military science is one who possesses outstanding qualities of military leadership, a high moral character and a definite aptitude for military service; whose academic record or demonstrated leadership shows distinction; and who has completed or will complete within one year the Advanced Course, Senior Division, of the Reserve Officers Training Corps.

The Eastern College Athletic Conference Medallion is awarded to a man and a woman at the end of their junior year in recognition of excellence in scholarship and athletics.

The George R. Faint Prize, established by his colleagues in recognition of his service to the University as registrar, is awarded to a student in liberal arts whose work during the first, sophomore and junior years is of generally high quality and gives promise of future excellence.

The Kenneth W. Freeman Leadership in Management Prize Fund was created by gifts from Kenneth W., Class of 1972, and Janice Freeman. Income from the fund will provide an annual prize to a graduating senior in the Freeman College of Management who has demonstrated exemplary leadership within the college and at the University.

The William C. Gretzinger Prize was established in honor of William C. Gretzinger, A.M., Class of 1889, the first registrar of the University, by the heirs of Mr. Gretzinger and by the University, for the senior with the highest standing in economics.

The Barbara Watson Grever Prize was endowed by family and friends in memory of Barbara Watson Grever, Class of 1967, and is to be awarded to an outstanding musician, with preference being given to a student of voice or piano. A junior student will be designated by the Department of Music as the intended recipient. The Grever Prize will be awarded at the end of the senior year.

The Professor William T. Grier Prize was established by the Class of 1871 for the first-year student with the highest standing in Latin.

The Allan Gates Halline Prize in American Literature, the proceeds of a fund contributed by the friends of Dr. Halline, will be awarded annually to the student who makes the best record in one year's work in American literature.

The Jeffrey James Harold Prize was established in memory of Jeffrey James Harold, Class of 1978, for the student in electrical engineering who achieves the highest cumulative grade point average for the first year.

The H. Boardman Hopper Prize, given by Mrs. H. Boardman Hopper in memory of her husband, is awarded to the graduating senior whose degree is achieved by unusual perseverance.

The Professor George Allison Irland Prize, established by Lillian S. Irland in memory of her husband, is awarded annually to that member of the graduating class who has the highest standing in electrical engineering.

The Alvin F. Jackson Jr. '59 Memorial Scholar-Athlete Award, which honors the memory of an alumnus and father of a member of the Class of 1989, is given for excellence in athletics and academics, leadership, loyalty and courage.

The Michael D. LaGrega Award for Excellence in Environmental Engineering is awarded to a member of the graduating class in civil and environmental engineering whose academic achievements and interests show outstanding promise for a career in environmental engineering.

The Maria Leonard Senior Book Award is given to the graduating senior members of Alpha Lambda Delta with the highest GPA in their class.

The Jeannine C. Liutkus Prize was established to honor the memory of Jeannine C. Liutkus, Class of 1993. It is given to the Bucknell en France student who, through individual initiative and perseverance, improved their proficiency in French, made the most of the opportunity to live in the French culture and showed significant personal growth.

The John T. Lowry Jr. Prize is awarded to the outstanding graduate in biology.

The W. Norwood Lowry Prize is awarded to that member of the graduating class enrolled in physics who shows the greatest achievement and promise in physics.

The Dorothy Walls McCormick Prize was established by William C. Walls in honor of his daughter, Dorothy Walls McCormick, to be awarded to that student in the graduating class from Union County or a designated portion of Northumberland County who, during their senior year, has demonstrated qualities by which other students have been helped in their daily living and in their personal development.

The Hugh F. McKeegan Prize is awarded to a graduating senior, preferably with a major in English or social studies, who has earned teaching certification and who, in the judgment of the Department of Education, best exemplifies those qualities of character, scholarship, skill in teaching and commitment to young people required for effective service in the teaching profession.

The Harold W. Miller Prize has been established by the University Honors Council through contributions from friends and alumni to honor the memory of Professor Miller, who founded the Honors Program at Bucknell, and to encourage excellence in honors work.

The Vivian Miller Prize in British & Irish Literature, established from the proceeds of a fund contributed by Vivian Miller, is awarded annually to the student who makes the best record in one year's work in British or Irish literature.

The Moles Civil Engineering Award, established by The Moles Society, is awarded to the civil engineering student whose academic achievement and application for the first three years show outstanding promise for a career in construction engineering and management.

The J. William Moore Prize was established by gifts from students, friends, family and colleagues of Professor Moore. The prize is awarded to the senior who most completely exemplifies the original goal of a historic Bucknell education. First and foremost, they demonstrate in their life in a significant way traditional values, including courage, honesty and compassion for others. They also have achieved high academic success in coursework in education.

The William H. & Carl W. Neff Prize is awarded to a member of the graduating class in mechanical engineering who, through positive attitude, desire and determination, has shown exceptional academic and personal growth during their academic career at Bucknell.

The Richard P. Nickelsen Prize is awarded to a senior demonstrating outstanding performance in geology. This prize was established in honor of Dr. Nickelsen, professor emeritus at Bucknell University, recipient of the Lindback Award for Teaching, and recipient of the Career Contribution Award from the Structural Geology and Tectonics Division of the Geological Society of America. During approximately 30 years as a geology professor at Bucknell University, Dr. Nickelsen devoted his considerable energy to cultivating student interest and skills in geology. He had an enormous impact on geology students over the years and his legacy lives on in the lives of alumni and the program he helped to shape.

The Elizabeth M. Oliphant Prize was established by Professor J. Orin Oliphant in memory of his wife and is to be awarded annually to that woman of the graduating class who, being generally excellent in scholarship, has obtained in the courses required for a major in chemistry or in any subject in biological science the highest average of those women of her class whose majors are within these fields. The University offers a similar prize for men called the **University Prize for Men**.

The J. Orin Oliphant Graduation Prize was established by J. Orin Oliphant, professor emeritus of history, to be awarded to that senior attaining the highest average among those receiving the degree of Bachelor of Arts.

The Phi Beta Kappa Award is given to the undergraduate who, by work of art, research or scholarship, shows in any discipline conspicuous achievement.

The Professor George Morris Philips Prize was established by the Class of 1871 for the first-year student with the highest standing in mathematics.

The Pi Mu Epsilon Society Prize is awarded to that member of the graduating class whose work in mathematics has been outstanding.

The James M. Pommersheim Research & Innovation in Engineering Award is given to the engineering student who has achieved through creative effort outstanding work of scholarship or invention.

The President's Award for Distinguished Academic Achievement is awarded annually to those students who demonstrate the highest level of academic achievement by attaining a cumulative GPA of 4.00 on a scale of 4.00.

The Matthew B. Ridgway Jr. Award, established in memory of the late Matthew B. Ridgway Jr., Class of 1971, is given by the George C. Marshall Research Foundation to the member of the graduating class who best exemplifies the character, selflessness, integrity and dedication to country demonstrated by General Marshall and by Matthew Ridgway Jr.

The Louis W. Robey Prize, endowed by friends in honor of Louis W. Robey, A.D., LL.B., LL.D., Class of 1904, is given to the members of the senior class who best exemplify the aims of a Bucknell education.

The Walter H. Sauvain Prize, endowed by friends of Professor Sauvain for his 36 years as a professor of education at Bucknell and adviser of many undergraduate and graduate students in education, is awarded to the senior majoring in education who shows the greatest achievement and promise for professional growth and service.

The Thelma Johnson Showalter Prize was established by the Pennsylvania Federation of Women's Clubs in honor of Thelma Johnson Showalter, Class of 1929, for that member of the graduating class who, in the judgment of the president of the University or such committee as may be appointed, shall have shown the greatest potential in the field of public and community affairs.

The Robert E. Slonaker Jr. Memorial Award is given to a graduating chemical engineering student who has demonstrated outstanding achievement within the field of materials science and engineering.

The Julia Fonville Smithson Memorial Prizes, one for poetry, one for nonfiction and one for fiction, are to be awarded annually for excellence in undergraduate writing to students whose dedication to the sharing and the making of literature carries into the future the spirit of Julia Smithson.

The Helen E. Sprague Prize was established by Frank A. Sprague, professor of Spanish, in memory of his wife, and is to be awarded annually to that member of the graduating class who demonstrates exceptional ability in Spanish.

The Ralph A. Still & Anne B. Still Prize was established by the Class of 1913 and is to be awarded annually to that member of the junior class majoring in English who has the highest standing in English.

The Susan Hensinger Thomas Prize, established in her memory by members of Alpha Phi, is awarded to the graduating senior who best promotes goodwill by applying an understanding of psychological principles to daily living.

The Herbert Tustin Prize was established by Professor Francis Wayland Tustin, Ph.D., Class of 1856, in memory of his son, for the senior with the highest standing in philosophy and psychology.

The Anna Slifer Walls Prize was established by William C. Walls, A.B., A.M., Class of 1873, in memory of his wife, Anna Slifer Walls, for that student from Union County or a designated portion of Northumberland County majoring in history who presents during their senior year the best paper concerned with American history.

The Dr. E. Slifer Walls Prize was established by William C. Walls in memory of his son, Dr. E. Slifer Walls, Class of 1903, to be awarded upon graduation to the pre-medical student or public health student from Union County or a designated portion of Northumberland County who has shown during their junior year the highest standards of combined will and devotion to the ideals of the profession for which they are making preparation.

The John A. Walls Prize was established by William C. Walls in honor of his son, John A. Walls, Sc.D., to be awarded upon graduation to that student from Union County or a designated portion of Northumberland County who, during their sophomore year conducted research in the field of literature, history, the physical sciences or engineering, which shall exhibit the greatest degree of thoroughness, care, intellectual honesty, good judgment and adequacy in the research and in the presentation of the conclusions.

The Agnes Archer Warren Award, established in honor of the wife of Dr. W. Preston Warren, professor emeritus of philosophy, consists of selected books awarded to a student in the College of Arts & Sciences for a written work demonstrating well-informed use of a range of sources in several disciplines.

The W. Preston Warren Prize, endowed by friends in honor of Professor Warren for his 26 years as a distinguished professor of philosophy at Bucknell, is awarded to that senior majoring in philosophy who shows the greatest achievement and promise in philosophy.

The Charles F. White Memorial Prize for Scholar-Athletes was established in 1991 to honor and reward a student or students recognized by the University as earning the designation “Scholar-Athlete” as defined by the University, and who intends to pursue graduate studies either immediately or in the future.

The H. W. Wieder Prize for Susquehanna River Research was created to honor Skip Wieder's lifetime of leadership and commitment to the health and welfare of the Susquehanna River and its many communities. The prize will be awarded annually to the senior who has completed and presented an exemplary scholarship on the Susquehanna River during their program at Bucknell.

The Yarnall Prize in Environmental Affairs, endowed by Dr. John L. Yarnall in memory of his father, mother and brother, is awarded to a junior or senior who has a high academic standing and has demonstrated leadership in and contribution to environmental affairs.

The Samuel Lewis Ziegler Prizes were established by the late Samuel Lewis Ziegler, M.D., LL.D., Class of 1880, and consist of a prize for the first-year student whose preliminary examinations in English show the greatest proficiency in the elements of English composition; a prize for the junior who shows the greatest proficiency in English composition and literature; a prize for the member of the class in French conversation who excels in this subject; and a prize for the senior who best exemplifies the goals of a pre-medical education.

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Shaunna Barnhart, Ph.D., Director, Place Studies Program
Benjamin Hayes, Ph.D., Director, Watershed Sciences & Engineering Program
Janeen Putman, M.H.R.D., Operations Director
Olyssa Starry, Director, Sustainable Technology Program

Farm & Garden

Jen Schneidman Partica, B.A., Farm & Garden Manager

Graduate Studies

Ghislaine McDayter, Ph.D., Associate Provost for Research & Creative Inquiry

Global & Off-campus Education

Stephen K. Appiah-Padi, Ph.D., Director

Griot Institute

Cymone Fourshey, Ph.D., Director

Internationalization Initiative - Bucknell Beyond Borders

Katherine M. Faull, Ph.D., Associate Provost

Pathways

Rebecca L. Thomas, Ph.D., Director

Registrar's Office

Tim Kracker, M.A., University Registrar

Residential Colleges

Kelly R. Finley, M.A., Program Director

Samek Art Museum

Richard Rinehart, M.A., Director

Sponsored Projects

Robert Gutierrez, M.Sc., Executive Director

Stadler Center for Poetry & Literary Arts

Joseph Scapellato, M.F.A., Director

Summer Session

Joe Tranquillo, Ph.D., Associate Provost for Transformative Teaching & Learning

Teaching & Learning Center

Ashli Baker, Ph.D., Director

Undergraduate Fellowships & Research

Margaret H. Marr, J.D., Director

Weis Center for the Performing Arts

Kathryn L. Maguet, M.A., Executive Director

Writing Center

Edmund Searles, Ph.D., Writing Program Director

University Advancement

University Strategy & Advancement
Scott G. Rosevear, Ph.D., Senior Vice President

Center for Career Advancement
Pamela Grow Keiser, M.S., Executive Director

Engagement & Strategic Outreach
Natasha Williams, B.A., Executive Director, Alumni, Family & Philanthropic Engagement

People, Success & Operations
Lucille M. Tarin, B.S., Assistant Vice President

Strategic Advancement Services & Campaign Administration
Kathleen Graham, J.D., Associate Vice President

Strategic Philanthropy
Joshua L. Grill, M.A., Associate Vice President

Library & Information Technology

Vice President for Library & Information Technology, Param Bedi, M.S., M.B.A.

Information Technology

Associate Vice President, Information Technology, Stephen O'Hara, M.B.A.
Executive Director, Enterprise Technologies, Kevin C. Willey, M.S.
Associate Director, Enterprise Technology Development & Operations, Harshul Sharma, M.S.
Software Engineer, Patrick Buchheit, B.S.
Software Engineer, Arpita Dev, M.S.
Software Engineer, Christopher Kern, B.S.
Software Engineer, Eric Lipsky, B.S.
Software Engineer, Daniel Mancusi, B.S.
Software Engineer, Achennaki Shylla, M.S.
Associate Director of Systems & Operations, Jennifer M. Harper, A.B.
Cloud Systems Analyst, Gérald Beauvais, M.S.
Systems Engineer, Lorraine R. Eisenhuth, B.S.
Systems Engineer/Database Administrator, Kyle Herb, B.S.
Senior Cloud Systems Engineer, Wade Hutchison, M.S.
Senior Cloud Systems Analyst, Kirsten Walter, B.S.
Cloud Architect, Ian Wat, B.S.
Associate Director, Network & Telephony, Stephanie Farnsworth, B.S.C.S.
Network Administrator, Aaron Gerrish, B.A.
Network Engineer, William Gill, B.S.
Network Engineer, Michael Grybos, B.S.
Telecommunications & Infrastructure Engineer, Harold Kerlin
Network Engineer, Hallie Mull, A.A.S.

Telecommunications Systems Administrator, Peggy Straub
Director of Events, Classroom & Lab Technology Services, George A. Lincoln III, M.A.
Senior Event Technology Support Specialist, Jeffrey R. Campbell, B.S.
Senior Classroom Technology Support Specialist, Todd Downs, B.A.
Senior Event Technology Support Specialist, Jesse Greenawalt
Classroom Technology Support Specialist, Matthew Kunkel, A.A.S.
Senior Classroom Technology Support Specialist, Michael R. Pursley, B.A.
Director, Technology Support, Mary Ann Burkland, M.A.
Manager, Technology Integration, George M. Casper, B.S.
Senior Technology Support Specialist, Todd E. Fogle
Senior Technology Support Specialist, Stuart Nicoll
Assistant Director Technology Support, Alison Morse, M.I.S.
Technology Support Specialist, Russel C. Eisenhuth
Madeline Farber, Technology Support Specialist, B.S.
Technology Support Specialist, Ryan Keller, B.A.
Technology Support Specialist, Scott Ritter
Senior Specialist, Client Support, Robert Guissanie Jr., B.S.
Jamie Lindsey, Manager Technology Service Points
Client & Application Support Specialist, Melissa Rycroft, M.A.
Procurement & Asset Analyst, Toni Baylets-Holsinger
Budget & Procurement Analyst, Kelly Stover
Senior Project Manager, Abigail Brown, B.S.
IT Project Manager, Charles Weber, B.S.
Senior IT Project Manager, Mary Lisa Veloz, B.A.
Information Security Officer, Brandon Seymore, M.B.A.

Office of Institutional Research & Analytics

Associate Vice President & Chief Analytics Officer, Kevork Horissian, M.A., M.B.A.
Data Analytics Architect, Michael Latorre, B.S.
Data Analytics Engineer, Douglas A. LeBlanc, B.S.
Director, Institutional Research, Rita Liu, Ph.D.
Data Solutions Analyst, Sohini Palit, M.S.
Institutional Research & Decision Support Analyst, Jocelyn Zhao, M.S.
Assessment Coordinator, Wei You, Ph.D.

Library Services

Dean, Library Services, Katherine Furlong, M.L.I.S.
University Archivist & Director of Special Collections, Susan Falciani Maldonado, M.L.I.S.
Assistant University Archivist & Records Management Coordinator, Eir Danielson, M.L.I.S.
Assistant Director, Collection Strategies & Discovery, Daniel Heuer, M.A.
Director Research Services & Information Literacy, Jill Hallam-Miller, M.L.S., M.E.T.
Arts & Humanities Librarian, Mary Broussard, M.L.S.
Student Experience & Outreach Specialist, Benjamin A. Hoover, M.S.
Research Data Services Specialist, Katie Akateh, M.P.P.
Research & Instruction Librarian, Ilse Allen, M.A., M.L.I.S.
Social Sciences Librarian, Carrie Pirmann, M.L.S., M.L.I.S.
Librarian/Communications & Outreach Coordinator, Jason Snyder, M.A., M.L.S.
Associate Director of Digital Pedagogy & Scholarship, Todd Suomela, Ph.D.
Digital Media Specialist, Wes Bernstein, M.S.
Digital Pedagogy & Scholarship Specialist for GIS & Spatial Thinking, Janine Glathar, M.E.S.
Digital Scholarship Coordinator, Diane Jakacki, Ph.D.
Digital Pedagogy & Scholarship Specialist, Public Scholarship, Kate Tuley, M.A.
Manager, Instructional Technology, Brandon Karcher, M.S.
Digital Pedagogy & Scholarship Specialist, Claire Cahoon, M.S.
Digital Pedagogy & Scholarship Specialist, Leslie D. Harris, Ph.D.

Student Enrollment, Engagement & Success

Lisa Keegan, J.D. , Vice President for Student Enrollment, Engagement & Success

Admissions

Kevin T. Mathes '07, M.Ed., Assistant Vice President & Dean of Admissions,

Center for Access & Success

Chris Brown, M.B.A., Andrew Hartman '71 & Joseph Fama '71 Executive Director of the Center for Access & Success

Financial Aid

Erin M. Wolfe, B.S., Director of Financial Aid

Student Affairs

Maureen "Moe" McGuinness, Ed.D., Associate Vice President and Fritz Family Dean of Students

Campus Activities & Programs

Erin S. Paschal, M.Ed., Associate Dean of Students

Health, Wellness & Safety

John H. Dunkle, Ph.D., Interim Associate Dean of Students for Health & Wellness

Living, Learning & Leadership

Jane Grassadonia, Ph.D., Associate Dean of Students

Marketing & Communications

Heather Johns P'27, B.A., Vice President for Marketing & Communications
Brandy Kift, B.A., Assistant Vice President of Marketing Strategy
Mike Ferlazzo, B.S., Director of Media Relations
Matt Hughes, M.A., Director of Content Strategy
Thomas Lydon, B.A., Director of Publications, Print & Mail
Christina Masciere Wallace P'22, B.A., Director of Executive & Internal Communications

Faculty

Officers of the Faculty

- Chair, Lofgren, Erik Robert, Associate Professor of East Asian Studies, Ph.D. Stanford
- Secretary, Cheville, R. Alan, Professor of Electrical Engineering, Ph.D. Rice

Emeriti

- Abrahamson II, Warren Gene, David Burpee Professor of Plant Genetics, emeritus, Ph.D. Harvard
- Aburdene, Maurice Felix, Professor of Electrical Engineering & Computer Science, emeritus, Ph.D. Connecticut
- Acuña, Carmen Olga, Associate Professor of Mathematics, emerita, Ph.D. Massachusetts
- Adams, Gregory Thomas, Professor of Mathematics, emeritus, Ph.D. Indiana
- Anderson, John Whiting, Professor of Economics, emeritus, Ph.D. Pennsylvania
- Anderson, Owen Thomas, Professor of Physics, emeritus, Ph.D. Wisconsin
- Andersson, Christiane Dagmar, Professor of Art, emerita, Ph.D. Stanford
- Andrews, Marcellus, Professor of Economics, emeritus, Ph.D. Yale
- Archambault, Marianna Mustacchi, Professor of French, emerita, Ph.D. Pennsylvania
- Beard, Robert Earl, Professor of Russian and Linguistics, emeritus, Ph.D. Michigan
- Becker, Stephen Fraley, Associate Professor of Physics, emeritus, Ph.D. Rutgers
- Becker, William Hartshorne, Professor of Religion, emeritus, Ph.D. Harvard
- Bettner, Mark Steven, Professor of Management, emeritus, Ph.D. Texas Tech
- Blair, Harry Wallace, Professor of Political Science, emeritus, Ph.D. Duke
- Buck, Paula Closson, Professor of English, emerita, Ph.D. Ohio
- Buffinton, Christine M., Associate Professor of Mechanical Engineering, Ph.D. Stanford
- Buffinton, Keith William, Professor of Mechanical Engineering and Dean, College of Engineering, emeritus, Ph.D. Stanford

- Carr, Glynis, Associate Professor of English, emerita, Ph.D. Ohio State
- Cartwright, David John, Professor of Mechanical Engineering, emeritus, Ph.D. Southampton
- Casteel, Dee Ann, Associate Professor of Chemistry, emerita, Ph.D. Illinois at Urbana-Champaign
- Chernin, Mitchell Irwin, Professor of Biology, emeritus, Ph.D. Clemson
- Clapp, Charles Himes, Professor of Chemistry, emeritus, Ph.D. Harvard
- Clingham, Gregory John Haydn, Professor of English, emeritus, Ph.D. Cambridge
- Cooper, John Neale, Professor of Chemistry, emeritus, Ph.D. California-Berkeley
- Daepp, Ulrich, Professor of Mathematics, emeritus, Ph.D. Michigan State
- Daubman, Kimberly Ann, Associate Professor of Psychology, emerita, Ph.D. Maryland
- Davis, Paula Denise, Associate Professor of Theatre & Dance, emerita, M.F.A. Arizona State
- Delgado, Manuel, Professor of Spanish, emeritus, Ph.D. Texas at Austin
- DiStefano, Thomas Dominic, Professor of Civil & Environmental Engineering, emeritus, Ph.D. Cornell
- Elze, Nora Giavelli, Assistant Professor of Physical Education, emerita, M.A. Bucknell
- Evans, Jeffrey Clinton, Professor of Civil & Environmental Engineering, Ph.D. Lehigh
- Fischer, Susan Leibowitz, Professor of Spanish and Comparative Literature, emerita, Ph.D. Duke
- Fleming, Richard, Professor of Philosophy, emeritus, Ph.D. Kansas
- Fletcher, David John Crispian, Professor of Biology and Animal Behavior, emeritus, Ph.D. Natal
- Floody, Owen Robert, Professor of Psychology, emeritus, Ph.D. Rockefeller
- Folkers, George Fulton, Professor of German, emeritus, Ph.D. Princeton
- Gainer, Robert, Associate Professor of Theatre, emeritus, M.F.A. Yale School of Drama
- Gerdes, Eugenia Proctor, Professor of Psychology and Dean, College of Arts & Sciences, emerita, Ph.D. Duke
- Goodale, James A., Associate Professor of History, emeritus, Ph.D. California at Los Angeles
- Gorkin, Pamela Beth, Professor of Mathematics, emerita, Ph.D. Michigan State
- Grant, Gary Michael, Professor of Theatre, emeritus, Ph.D. Pittsburgh
- Greaves, Thomas C., Professor of Anthropology, emeritus, Ph.D. Cornell
- Griffith, Winston Harold, Professor of Economics, emeritus, Ph.D. Howard
- Grundstrom, Allan Wilbur, Professor of French and Linguistics, emeritus, Ph.D. Michigan
- Gruver, William R., Howard I. Scott Chair in Global Commerce, Strategy & Leadership, emeritus, M.B.A. Columbia
- Guattery, Stephen M., Associate Professor of Computer Science, emeritus, Ph.D. Carnegie Mellon
- Guthrie, Cynthia, Associate Professor of Management, emerita, Ph.D. Virginia Commonwealth
- Haggard, Gary, Professor of Computer Science, emeritus, Ph.D. Purdue
- Hannigan, Barry Thomas, Professor of Music, emeritus, D.M.A. Eastman School of Music
- Hanyak Jr., Michael Edward, Professor of Chemical Engineering, emeritus, Ph.D. Pennsylvania
- Hauck, William Edward, Professor of Education, emeritus, Ph.D. Wisconsin
- Heath, James Maguire, Associate Professor of Classics & Ancient Mediterranean Studies, emeritus, Ph.D. Princeton
- Hendry, Jamie R. (2000), Associate Professor of Management, Ph.D. Virginia
- Hill, Stephen Jackson, Professor of Music, emeritus, Ph.D. North Carolina at Chapel Hill
- Hiller, Tammy Bunn, Professor of Management, emerita, Ph.D. North Carolina at Chapel Hill
- Hoffman, Lynn, Associate Professor of Education, emerita, Ed.D. Maryland
- Hopkins, Elaine, Associate Professor of French, emerita, Ph.D. North Carolina at Chapel Hill
- Hu, Er-Dong, Professor of Dance, emeritus, M.F.A. Iowa
- Huffines, Marion Lois, Professor of German and Linguistics, and Associate Vice President for Academic Affairs, emerita, Ph.D. Indiana
- Hutton, James Edward, Associate Professor of Mathematics, emeritus, Ph.D. Cornell
- Hyde, Daniel Clair, Associate Professor of Computer Science, emeritus, Ph.D. Illinois at Urbana-Champaign
- Jamieson, Sidney Irwin, Assistant Professor of Physical Education, emeritus, B.S. Cortland State
- Jones, Janet Duncan, Professor of Classics & Ancient Mediterranean Studies, emerita, Ph.D. North Carolina at Chapel Hill
- Judge, Peter G., Professor of Psychology and Animal Behavior, emeritus, Ph.D. Georgia
- Kastner, Margaret Ellen, Professor of Chemistry, emerita, Ph.D. Notre Dame
- Keitel, Peter, Professor of German, emeritus, Ph.D. Wisconsin-Madison
- Kendrick, John Murray, Professor of Sociology, emeritus, Ph.D. Northwestern
- Kim, Jai Bin, Professor of Civil & Environmental Engineering, emeritus, Ph.D. Maryland
- Kim, Hong Wha, Professor of Mathematics, emeritus, Ph.D. New York

- King Jr., William Emmett, Professor of Chemical and Biomedical Engineering, emeritus, Ph.D. Pennsylvania
- Kirby, Carl Scott, Professor of Geology, emeritus, Ph.D. Virginia Polytechnic Institute and State University
- Knisely, Charles William, Professor of Mechanical Engineering, emeritus, Ph.D. Lehigh
- Kochel, R. Craig, Professor of Geology, emeritus, Ph.D. Texas at Austin
- Kresl, Peter Karl, Professor of Economics and International Relations, emeritus, Ph.D. Texas at Austin
- Krohn, Gregory Alan, Associate Professor of Economics, emeritus, Ph.D. Wisconsin
- Lasansky, William Abraham, Professor of Art, emeritus, M.F.A. Iowa
- Lewis, Linden Forbes, Professor of Sociology, emeritus, Ph.D. American
- Ligare, Martin Kenneth, Associate Professor of Physics, emeritus, Ph.D. Columbia
- MacGaffey, Janet, Associate Professor of Anthropology, emerita, Ph.D. Bryn Mawr
- Maneval, James Edward, Professor of Chemical Engineering, emeritus, Ph.D. California-Davis
- Mann, Janice Elaine, Associate Professor of Art History, emerita, Ph.D. Columbia
- Marsh, David Putnam, Professor of Geography, and Environmental Studies, emeritus, Ph.D. Pennsylvania State
- Massoud, Tansa George, Associate Professor of Political Science, emeritus, Ph.D. New York
- McDiffett, Wayne Francis, Professor of Biology, emeritus, Ph.D. Georgia
- McGoun, Elton George, Professor of Management, emeritus, Ph.D. Indiana
- McGuire, Paul Joseph, Professor of Mathematics, emeritus, Ph.D. Indiana
- McLaughlin, Elizabeth Taylor, Associate Professor of English, emerita, Ph.D. Harvard
- Meng, Xiannong, Professor of Computer Science, emeritus, Ph.D. Worcester Polytechnic Institute
- Miller, John A., Professor of Management, emeritus, Ph.D. Rochester
- Milofsky, Carl, Professor of Sociology, emeritus, Ph.D. California-Berkeley
- Morin, Karen Marie, Professor of Geography and Special Assistant to the Provost for Middle States Reaccreditation, Ph.D. Nebraska-Lincoln
- Morris, Saundra Kay, Professor of English, emerita, Ph.D. Cornell
- Morris-Keitel, Helen G., Associate Professor of German, emerita, Ph.D. Wisconsin-Madison
- Morrison, Sally Dyer, Associate Professor of Mathematics, emerita, Ph.D. Rochester
- Needham, Robert Arthur, Adjunct Associate Professor of Management, emeritus, M.B.A. Youngstown State
- Neuman, Mark Donald, Professor of History, emeritus, Ph.D. California-Berkeley
- Noguchi, Paul Hideyo, Professor of Anthropology and East Asian Studies, emeritus, Ph.D. Pittsburgh
- Nottis, Katharyn E.K., Professor of Education, emerita, Ph.D. State University of New York at Buffalo
- Orbison, James Graham, Professor of Civil Engineering and Dean, College of Engineering, emeritus, Ph.D. Cornell
- Page, Kathleen Creed, Professor of Biology, emerita, Ph.D. Pennsylvania State
- Para, Christopher, Associate Professor of Music, emeritus, M.M. Eastman School of Music
- Patrick, Leslie Cheryl, Associate Professor of History, emerita, Ph.D. California-Santa Cruz
- Payne, William Austin, Professor of Music, emeritus, D.M.A. West Virginia
- Peeler, John Allen, Professor of Political Science, emeritus, Ph.D. North Carolina at Chapel Hill
- Peterec, Richard Joseph, Professor of Geography and International Relations, emeritus, Ph.D. Columbia
- Pollack, Harriet Rebecca, Professor of English, emerita, Ph.D. Virginia
- Pommersheim, James Martin, Professor of Chemical Engineering, emeritus, Ph.D. Pittsburgh
- Poteet, LaVonne Camille, Associate Professor of Spanish, emerita, Ph.D. Bryn Mawr College
- Poust, Alice Jan, Associate Professor of Spanish, emerita, Ph.D. Texas at Austin
- Pusey, Anne Wang, Adjunct Associate Professor of East Asian Studies, emerita, M.A., M.S.B.A. Bucknell
- Randall, Annie Janeiro, Professor of Music, emerita, Ph.D. Cincinnati
- Reynolds, Craig Anthony, Associate Professor of Physical Education, emeritus, M.Ed. Pittsburgh
- Rich, Thomas Paul, Professor of Mechanical Engineering and Dean, College of Engineering, emeritus, Ph.D. Lehigh
- Richards, Rosalyn Ann, Professor of Art, emerita, M.F.A. Yale
- Rickard, John S., Professor of English, emeritus, Ph.D. North Carolina at Chapel Hill
- Root, Charles Arthur, Professor of Chemistry, emeritus, Ph.D. Ohio State
- Sanjian, Gregory S., Professor of Political Science, emeritus, Ph.D. Indiana
- Schoepf, David Carl, Associate Professor of Physics, emeritus, Ph.D. Brandeis
- Schloss, Marc R., Associate Professor of Anthropology, emeritus, Ph.D. Virginia
- Schweinsberg, Allen Ross, Professor of Mathematics, emeritus, Ph.D. Pittsburgh
- Schweizer, Harold, Professor of English, emeritus, Ph.D. Zurich

- Serra, Thiago, Assistant Professor of Analytics & Operations Management, emeritus, Ph.D. Carnegie Mellon
- Shackelford, Jean Ann, Professor of Economics, emerita, Ph.D. Kentucky
- Shrivastava, Paul, Professor of Management, emeritus, Ph.D. Pittsburgh
- Silberman, Matthew, Professor of Sociology, emeritus, Ph.D. Michigan
- Snyder, William James, Professor of Chemical Engineering, emeritus, Ph.D. Pennsylvania State
- Sojka, Gary Allen, Professor of Biology, emeritus, and President, emeritus, Ph.D. Purdue
- Stamos Jr., Stephen Chris, Professor of International Relations, emeritus, Ph.D. Antioch
- Sanjian, Andrea Stevenson, Associate Professor of Political Science, emerita, Ph.D. Indiana
- Steiner, Gary Mitchell, Professor of Philosophy, emeritus, Ph.D. Yale
- Stryker, Peter Copeland, Associate Professor of Mechanical Engineering, emeritus, Ph.D. Minnesota
- Susman, Paul Henry, Professor of Geography, emeritus, Ph.D. Clark
- Svard, Lois A., Professor of Music, emerita, D.M.A. Peabody Institute of Johns Hopkins
- Sweeney, Timothy William, Professor of Management, emeritus, Ph.D. Pennsylvania State
- Tlusty, Beverly Ann, Professor of History, emerita, Ph.D. Maryland
- Tonzetich, John, Associate Professor of Biology, emeritus, Ph.D. Duke
- Travis, Thomas Allen, Professor of Political Science and International Relations, emeritus, Ph.D. Syracuse
- Verbrugge, Martha Helen, Professor of History, emerita, Ph.D. Harvard
- Waller, Richard Denham, Associate Professor of History and International Relations, emeritus, Ph.D. Cambridge
- Watson, Hilbourne Alban, Professor of International Relations, emeritus, Ph.D. Howard
- Weida, Nancy Coughlin, Associate Professor of Management, emerita, Ph.D. Delaware
- Wenner, Patricia Ann, Associate Professor of Computer Science, emerita, Sc.D. George Washington
- Wetzel, Mary Martens, Adjunct Assistant Professor of Education, emerita, M.S. Bucknell
- White, Nancy Elizabeth, Professor of Economics, emerita, Ph.D. Colorado
- Wilder, David Howard, Assistant Professor of Psychology and Director of Psychological Services, emeritus, Ph.D. Boston
- Williams, Brian Wesley, Professor of Chemistry, emeritus, Ph.D. Cornell
- Willits, Stephen D., Associate Professor of Management, emeritus, Ph.D. Texas Tech
- Younkin, Larry Myrle, Professor of Civil Engineering, emeritus, Ph.D. Virginia Polytechnic Institute and State University
- Zaccone, Richard Joseph, Associate Professor of Computer Science, emeritus, Ph.D. Pennsylvania State

Active Faculty

The date in parentheses following each name is the year of initial appointment to the Bucknell faculty. Listings are accurate as of the publication deadline of this catalog.

- Abowitz, Deborah Ann (1985), Professor of Sociology, Ph.D. Brown
- Adomako, Janet (2023), Assistant Professor of Geography and Environmental Studies & Sciences, Ph.D. Rutgers
- Agbo, Elinam (2023), Assistant Professor of English - Creative Writing, M.F.A. Michigan
- Albrizzio, Manuel (2023), Consortium for Faculty Diversity Postdoctoral Fellowship, Ph.D. Iowa
- Alexander, Raquel M. (2017), Professor of Accounting, Ph.D. Texas at Austin
- Allen, Douglas Edward (1995), Professor of Markets, Innovation & Design, Ph.D. Pennsylvania State
- Altendorf, Karen (2013), Assistant Teaching Professor of Sociology, Ph.D. Oklahoma State
- Amthor, Matthew (2012), Associate Professor of Physics, Ph.D. Michigan State
- Antonaccio, Maria Anita (1994), Professor of Religious Studies, Ph.D. Chicago
- Arici, Esra (2021), Assistant Teaching Professor of French & Francophone Studies, Ph.D. Universite Francois-Rabelais
- Armstrong, Elizabeth L. (1999), Teaching Professor of East Asian Studies, M.A. Indiana
- Arslan, Hasan (2017), Assistant Professor of Chemistry, Ph.D. Cornell
- Arthur, James (2018), Assistant Professor of Mechanical Engineering, Ph.D. Manitoba
- Atta-Darkua, Vaska (2024), Assistant Professor of Finance, Ph.D. University of Cambridge - Kings College
- Azhar, Shahram (2018), Associate Professor of Economics, Ph.D. Massachusetts-Amherst
- Bailey, Matthew D. (2007), Professor of Analytics & Operations Management, Ph.D. Michigan
- Baish, James William (1986), Professor of Biomedical Engineering, Ph.D. Pennsylvania
- Baish, Susan R. (2006), Teaching Professor of Computer Science, Ph.D. Pennsylvania
- Baker, Ashli (2013), Associate Professor of Classics & Ancient Mediterranean Studies, National Endowment for the Humanities Chair in the Humanities, Ph.D. Washington

- Balcells, Maria (2011), Assistant Professor of Philosophy, Ph.D. Illinois at Chicago
- Bakir, Erdogan (2008), Professor of Economics, Ph.D. Utah
- Baltz, Matthew (2017), Associate Professor of Sociology & Anthropology, Ph.D. California at Los Angeles
- Banciu, Mihai (2007), Howard I. Scott Professor of Business Analytics & Operations Management, Associate Dean of Faculty, Freeman College of Management, Ph.D. Pittsburgh
- Banks, Emma L. (2022), Assistant Professor of International Relations, Ph.D. Vanderbilt
- Banks, Nina E. (2001), Professor of Economics, Ph.D. Massachusetts at Amherst
- Barba, Paul (2017), Associate Professor of History, Ph.D. California at Santa Barbara
- Barnett, Ashyln (2024), Visiting Assistant Professor of Theatre & Dance, Ph.D. University of Colorado
- Barson, Benjamin (2024), Assistant Professor of Music, Ph.D. University of Pittsburgh
- Barth, Josie Torres (2023), Assistant Professor of English - Film/Media Studies, Ph.D. McGill
- Bayar, Tulu (2002), Professor of Art & Art History, M.F.A. Cincinnati
- Beal, Craig (2011), Associate Professor of Mechanical Engineering, Ph.D. Stanford
- Beardsley, Steven (2024), Visiting Assistant Professor of English, Ph.D. University of San Diego
- Beiler, Michelle R. (2011), Associate Professor of Civil & Environmental Engineering, Ph.D. Delaware
- Beninati, M. Laura (2005), Associate Professor of Mechanical Engineering, Ph.D. Iowa
- Benowitz-Fredericks, Z. Morgan (2007), Professor of Biology, Ph.D. Washington
- Berg, Jennifer (2019), Assistant Professor of Mathematics, Ph.D. Texas at Austin
- Bermingham, Kate (2021), Assistant Professor of Political Science, Ph.D. Notre Dame
- Bickel, Kelly A. (2014), Associate Professor of Mathematics, Ph.D. Washington in Saint Louis
- Biswas, Ritwika (2020), Assistant Professor of Geography, Ph.D. Temple
- Bjerre, Mette (2023), Assistant Professor of Sociology, Ph.D. Notre Dame
- Blanco, Fernando (2013), Professor of Spanish, Ph.D. Ohio State
- Boerman, Olivia (2022), Assistant Professor of Biomedical Engineering, Ph.D. Drexel
- Bond, Sandy (2024), Professor of Practice in Real Estate, Ph.D. Curtin University of Technology
- Bonfim, Leandro (2023), Assistant Professor of Management & Organizations, Ph.D. Federal University of Paraná
- Boomer, kb (2007), Professor of Statistics, Ph.D. Pennsylvania State
- Botelho, Paul (2012), Associate Professor of Music, Ph.D. Princeton
- Boyatzis, Chris James (1995), Professor of Psychology, Ph.D. Brandeis
- Boyd, Neil (2013), David J. '85 & Deborah West Professor in Management, Ph.D. Pennsylvania State
- Boxer, Carly (2023), Assistant Professor of Art & Art History, Ph.D. Chicago
- Brady, Nicholas (2019), Assistant Professor of Critical Black Studies, Ph.D., California, Irvine
- Brahma, Indranil (2009), Professor of Mechanical Engineering, Ph.D. Wisconsin at Madison
- Breyfogle, Mary Lynn (2001), Professor of Mathematics, Ph.D. Western Michigan
- Brooksbank, Peter (2004), Professor of Mathematics, Ph.D. Oregon
- Buck, James (2003), Visiting Assistant Professor of English, M.F.A. Maryland
- Buonopane, Stephen G. (2003), Associate Professor of Civil & Environmental Engineering, Ph.D. Johns Hopkins
- Burgos, Adam (2019), Associate Professor of Philosophy, Ph.D. Vanderbilt
- Burns, Courtney (2019), Associate Professor of Political Science, Ph.D. Missouri
- Butcher, Kenton (2023), Assistant Professor of English-Literary Studies, Ph.D. Pennsylvania
- Campbell, Claire (2014), Professor of History, Ph.D. Western Ontario
- Campbell, Terry (2018), Visiting Assistant Professor of Biology, Ph.D. South Florida
- Camuto, Christopher (2004), Associate Professor of English, Ph.D. Virginia
- Cannady, Emmanuel (2022), Assistant Professor of Sociology & Anthropology, Ph.D. Notre Dame
- Capaldi, Elizabeth A. (2000), Professor of Biology and Animal Behavior, Ph.D. Michigan State
- Cardenas, Stephanie A. (2023), Assistant Professor of Psychology, Ph.D. John Jay College of Criminal Justice
- Cassidy, Thomas (1999), Associate Provost, Academic Affairs and Professor of Mathematics, Ph.D. Oregon
- Castle, Karen J. (2002), Professor of Chemistry, Ph.D. Oregon State
- Cavanagh, Daniel P. (1999), Associate Professor of Biomedical and Chemical Engineering, Ph.D. Northwestern
- Cha, Hyeonjin (2024), Assistant Professor of Management & Organizations, Ph.D. University of Oregon
- Chamberlin, Ellen (2018), Assistant Professor of Geology & Environmental Geosciences, Ph.D. Pennsylvania State
- Chambers, Moria C. (2016), Assistant Professor of Biology, Ph.D. Stanford

- Chávez, Ángel (2024), Visiting Assistant Professor of Mathematics, Ph.D. University of Arizona
- Chen, Chun-Miin (Jimmy) (2014), Associate Professor of Analytics & Operations Management, Ph.D. Pennsylvania State
- Chen, Song (2011), Associate Professor of East Asian Studies, Ph.D. Harvard
- Chen, Yao (2024), Visiting Assistant Professor of Analytics & Operations Management, Ph.D. Clemson University
- Cheville, R. Alan (2012), Professor of Electrical Engineering, Ph.D. Rice
- Chidambaram, Soundarya (2017), Assistant Professor of Political Science, Ph.D. Ohio State
- Chow, Jeremy (2019), Assistant Professor of English, Ph.D. California, Santa Barbara
- Christian, Jenna (2018), Visiting Assistant Professor of Geography, Ph.D. Pennsylvania State
- Clark, Matthew Q. (2020), Assistant Professor of Biology, Ph.D. Oregon
- Collier, Bethany (2008), Professor of Music, Associate Dean, College of Arts & Sciences, Ph.D. Cornell
- Collins, Douglas (2018), Assistant Professor of Chemistry, Ph.D. California at San Diego
- Cort, Aisha (2023), Assistant Professor of Latin American Studies, Ph.D. Emory
- Crago, Richard (1999), Professor of Civil & Environmental Engineering, Ph.D. Cornell
- Csernica, Jeffrey (1989), Professor of Chemical Engineering, Ph.D. Massachusetts Institute of Technology
- Cuñado, Isabel (2003), Professor of Spanish, Ph.D. Cornell
- Curtin, Lorelei (2022), Assistant Professor of Geology & Environmental Geosciences, Ph.D. Columbia
- Cyr, Van T. (2013), Associate Professor of Mathematics, Ph.D. Pennsylvania State
- Dalleo, Peter Raphael (2015), Professor of English, Ph.D. State University of New York, Stony Brook
- Daly, Kevin F. (2003), Professor of Classics & Ancient Mediterranean Studies, Ph.D. Harvard
- Daniel, Christopher G. (2000), Professor of Geology, Ph.D. Rensselaer Polytechnic Institute
- Davis, Coralynn Val (1999), Professor of Women's & Gender Studies and Anthropology, Ph.D. Michigan
- Del Testa, David W. (2004), Associate Professor of History, Ph.D. California-Davis
- Delsandro, Erica (2013), Assistant Professor of Women's & Gender Studies, Ph.D. Washington in St. Louis
- Dhar, Udayan (2022), Sidney L. Miller Career Development Assistant Professor of Leadership, Ph.D. Case Western Reserve
- Dharmavaram, Sanjay (2018), Assistant Professor of Mathematics, Ph.D. Cornell
- Dick, Lara (2014), Associate Professor of Mathematics, Ph.D. North Carolina State
- Diego Gómez, Gabriela (2022), Associate Professor of Practice in Markets, Innovation & Design, Master's Universidad del Valle de Atemajac
- Dira, Lori (Smolleck) (2004), Associate Professor of Education, Ph.D. Pennsylvania State
- Doces, John A. (2007), Associate Professor of Political Science, Ph.D. Southern California
- Dong, JaiJai (2012), Professor of Physics & Astronomy, Ph.D. Virginia Polytechnic Institute and State University
- Donlin, Margo (2024), Assistant Professor of Mechanical Engineering, Ph.D. University of Delaware
- Donner, Amy (2003), Assistant Teaching Professor of Mathematics, M.S. Indiana University of Pennsylvania
- Dosemeci, Mehmet (2013), Associate Professor of History, Ph.D. Columbia
- Drexler, Michael (2003), Professor of English, Ph.D. Brown
- Dryden, Emily (2006), Professor of Mathematics, Ph.D. Dartmouth
- Dupont, Nathalie (2007), Associate Professor of French & Francophone Studies, Ph.D. Duke
- Durden, Elizabeth (2004), Professor of Sociology, Ph.D. Texas-Austin
- Dutcher, Dabrina (2013), Associate Professor of Chemistry, and Chemical Engineering, Ph.D. Minnesota
- Ebenstein, Donna M. (2006), Professor of Biomedical Engineering and William C. and Gertrude B. Emmitt Memorial Chair in Biomedical Engineering, Ph.D. California at Berkeley
- Eisenstein, Ken (2015), Associate Professor of English, Ph.D. Chicago
- Ellis, Christopher (2009), Professor of Political Science, Ph.D. North Carolina at Chapel Hill
- Enyeart, John P. (2004), Professor of History, Ph.D. Colorado-Boulder
- Evans, David W. (1998), Professor of Psychology, Ph.D. Boston
- Eversole, Robyn (2022), Howard I. Scott Professor of Practice in Social Entrepreneurship, Ph.D. McGill
- Exner, George Robert (1988), Professor of Mathematics, Ph.D. Michigan
- Faden, Eric S. (2000), Professor of English, Ph.D. Florida
- Farhadi, Vajiheh (2022), Assistant Professor of Electrical & Computer Engineering, Ph.D. Pennsylvania State
- Faull, Katherine Mary (1986), Professor of German and Comparative & Digital Humanities, and Special Adviser to the Provost, Ph.D. Princeton
- Favero Neto, Alomir H. (2020), Assistant Professor of Civil & Environmental Engineering, Ph.D. Stanford
- Fernando, Ashan (2020), Visiting Assistant Professor of Chemistry, Ph.D. Nevada
- Feuerstein, Abra Nathan (1996), Professor of Education, Ph.D. Virginia

- Field, Kenneth A. (2002), Professor of Biology, Ph.D. Cornell
- Flack Jr., William F. (2000), Professor of Psychology, Ph.D. Clark
- Flynt, Gabrielle (2012), Associate Professor of Statistics, Ph.D. Carnegie Mellon
- Fourshey, Catherine Cymone (2015), Professor of History and International Relations, Ph.D. California, Los Angeles
- Frey, Jonathan (2016), Associate Professor of Art & Art History, M.F.A. Pratt Institute
- Fruja, Ramona (2010), Associate Professor of Education, Ph.D. Michigan State
- Fuchsberger, Alexander (2018), Assistant Teaching Professor of Computer Science, Ph.D. Nebraska
- Gabauer, Douglas (2008), Professor of Civil & Environmental Engineering, Ph.D. Virginia Polytechnic Institute and State University
- Gabauer, Sarah Manoogian (2024), Visiting Assistant Professor of Mechanical Engineering, Ph.D. Virginia Polytechnic Institute and State University
- Gabriel, Bix (2021), Assistant Professor of English-Creative Writing, M.F.A. Indiana-Bloomington
- Gallimore, Jack F. (2000), Professor of Physics, Ph.D. Maryland
- Garthwaite, Sharon Anne (2007), Associate Professor of Mathematics, Ph.D. Wisconsin
- Gasaway, Brantley (2009), Associate Professor of Religious Studies, Ph.D. North Carolina at Chapel Hill
- Gates, Julie Ann (2006), Associate Professor of Biology, Ph.D. Utah
- Gazes, Regina (2014), Associate Professor of Psychology, Ph.D. Emory
- Geurts, Tom G. (2020), Associate Professor and William H. Dunkak Chair of Finance, Ph.D. Pennsylvania State
- Gholampour, Vahid (2016), Associate Professor of Economics, Ph.D. Virginia
- Gilmore, Kevin (2008, 2011), Associate Professor of Civil & Environmental Engineering, Ph.D. Virginia Polytechnic Institute and State University
- Golightly, Amy (2001), Professor of Education, Ph.D. Iowa
- Gosson, Renée K. (2000), Professor of French & Francophone Studies, Ph.D. Wisconsin at Madison
- Grant, Annetta (2017), Assistant Professor of Markets, Innovation & Design, Ph.D. Queens
- Gray, Mary Beth (1992), Professor of Geology, Ph.D. Rochester
- Green, Thomas (2024), Visiting Assistant Professor of Chemistry, Ph.D. Florida State University
- Gregory, Chase (2019), Assistant Professor of English, Ph.D. Duke
- Griffin, Duane A. (1999), Associate Professor of Geography, Ph.D. Wisconsin-Madison
- Grisel, Judith E. (2012), Professor of Psychology, Ph.D. Colorado
- Groff, Peter S. (2000), Professor of Philosophy, Ph.D. Pennsylvania State
- Guerrero, Elisabeth (1999), Professor of Spanish, Ph.D. Texas-Austin
- Gurmessa, Bekele (2019), Assistant Professor of Physics & Astronomy, Ph.D. North Dakota State
- Gutekunst, Samuel (2020), John D. and Catherine T. MacArthur Assistant Professor of Data Science, Ph.D. Cornell
- Guzel, Gulay Taltekin (2022), Assistant Professor of Markets, Innovation & Design, Ph.D. York University-Toronto
- Gwin, Carley (2016, 2021), Assistant Teaching Professor of Civil & Environmental Engineering, Ph.D. Duke
- Halpern, Andrea Rita (1982), Professor of Psychology, Ph.D. Stanford
- Hamilton, Joseph (Ted) (2022), Assistant Professor of English, Ph.D. Yale
- Hamlet, Christina (2016), Associate Professor of Mathematics, Ph.D. North Carolina at Chapel Hill
- Haque, M. Aynal (2024), Visiting Assistant Professor of International Relations, Ph.D. University of Connecticut
- Hariharan, Janani (2024), Smith Postdoc to Tenure Track Fellow in Biology, Ph.D. Cornell University
- Haussmann, Mark (2008), Russell-Childers Professor in the Laboratory Sciences, Professor of Biology, Ph.D. Iowa State
- Hauser, Brian (2024), Associate Professor of English, Ph.D. Ohio State University
- Havill, Jessen (2022), Professor of Computer Science, Ph.D. William & Mary
- Hays, K.A. (2010), Associate Professor of English, M.F.A. Brown
- Hecock, R. Douglas (2006), Associate Professor of Political Science, Ph.D. New Mexico
- Heinsohn, Bastian (2009), Associate Professor of German, Ph.D. California at Davis
- Heintzelman, Matthew B. (2004), Associate Professor of Biology and Cell Biology/Biochemistry, Ph.D. Yale
- Henry, Sue Ellen (1998), Professor of Education, Ph.D. Virginia
- Herman, Ellen K. (2006), Associate Professor of Geology, Ph.D. Pennsylvania State
- Higgins, Matthew John (1995), Professor of Civil & Environmental Engineering, Ph.D. Virginia Polytechnic Institute and State University
- Hill, Vanessa (2022), James and Elizabeth Freeman Chair in Management and Professor of Management & Organizations, Ph.D. Carnegie Mellon
- Holzwarth, Carly (2022), Assistant Professor of Theatre & Dance, M.F.A. Pennsylvania State
- Hopkins, Caleb Anthony (2022), Assistant Professor of Music, D.M.A. Eastman School of Music
- Hopper, Theo (2023), Emmitt Memorial Assistant Teaching Professor of Biomedical Engineering, M.S. Michigan

- Hughes, Yuka (2024), Visiting Assistant Professor of East Asian Studies, M.A. Nara Women's University
- Hunter, John C. (2000), Professor of Comparative Humanities, Ph.D. Duke
- Hutchinson, Anjalee Deshpande (2008), Professor of Theatre & Dance, M.F.A. Northwestern
- Intindola, Melissa (2021), Associate Professor of Management & Organizations, Ph.D. New Mexico State
- Isleem, Dena (2013), Assistant Teaching Professor of Arabic, B.A. Tel Aviv University
- Isleem, Martin (2009), Associate Professor of Arabic, Ph.D. Texas at Austin
- Iyer, Deepak (2015), Assistant Professor of Physics & Astronomy, Ph.D. Rutgers
- Jablonski, Erin L. (2004), Associate Professor of Chemical Engineering, Ph.D. Iowa
- Jacob, Robert (2008), Professor of Geology, Ph.D. Brown
- James, Michael R. (1999), Professor of Political Science, Ph.D. Duke
- Jansson, Peter Mark (2011), Associate Professor of Electrical Engineering, Ph.D. Cambridge
- Jensen, David Edward (1986), Associate Professor of Accounting & Financial Management, Ph.D. Pennsylvania State
- Jiang, Qing (2016), Associate Professor of Music, D.M.A. New England Conservatory of Music
- Johnson, Michelle C. (2002), Professor of Sociology, Associate Dean of Faculty, Social Sciences, Ph.D. Illinois at Urbana-Champaign
- Jordan, Stephen D. (2003), Professor of Biology, Ph.D. Connecticut
- Kabalan, Amal (2014), T. Jefferson Miers Chair in Electrical Engineering and Associate Professor of Electrical & Computer Engineering, Ph.D. Villanova
- Kang, Keegan (2022), Assistant Professor of Mathematics, Ph.D. Cornell
- Kasimova, Zukhra (2023), Assistant Professor of History, Ph.D. Illinois-Chicago
- Kell, Anna (2011), Associate Professor of Art & Art History, M.F.A. Florida
- Kelley, David F. (2001), Associate Professor of Electrical Engineering, Ph.D. Pennsylvania State
- Kennedy, Eric (2007), Professor of Biomedical Engineering, Ph.D. Virginia Polytechnic Institute and State University
- Kenny, William Emmett (1990), Professor of Music, Ed.D. Illinois at Urbana-Champaign
- Kerber, William D. (2007), Associate Professor of Chemistry, Ph.D. North Carolina at Chapel Hill
- Kim, Charles J. (2005), Professor of Mechanical Engineering, Ph.D. Michigan
- Kim, Grace Jue Yeon (2022), Assistant Professor of Education, Ph.D. Ohio State
- Kim, Yongkwang (2022), Visiting Assistant Professor of Political Science, Ph.D. Houston
- King, Brian R. (2010), Associate Professor of Computer Science, Ph.D. State University of New York, Albany
- Kingué, Angèle M. (1988), Professor of French & Francophone Studies, and Associate Provost for Faculty Engagement & Inclusion, Ph.D. Pennsylvania State
- Kinnaman, Thomas Christopher (1994), Professor of Economics, Charles P. Vaughan Chair in Economics, Ph.D. Virginia
- Knoedler, Janet Therese (1992), Professor of Economics, Ph.D. Tennessee
- Knox, Kelly (2003), Associate Professor of Theatre & Dance, M.F.A. Washington
- Kopec, Abigail (2023), Assistant Professor of Physics & Astronomy, Ph.D. Purdue
- Koutsoliotas, Sally (1996), Professor of Physics, Ph.D. Melbourne
- Kozick, Richard James (1993), Professor of Electrical Engineering, Ph.D. Pennsylvania
- Kragness, Haley E. (2022), Assistant Professor of Psychology, Ph.D. McMaster
- Kristjanson-Gural, David (2002), Professor of Economics, Ph.D. Massachusetts at Amherst
- Krout, Michael R. (2012), Associate Professor of Chemistry, Ph.D. California Institute of Technology
- Kubat, Jayne A. (2020), Assistant Teaching Professor of Biology, DVM Cornell
- Kuhn, Bernhard (2000), Professor of Italian, Ph.D. Otto-Friedrich-Universität, Bamberg, Germany
- Kumar, Ankita (2019), Assistant Professor of Markets, Innovation & Design, Ph.D. Wisconsin-Madison
- Kumar, Rajesh (2022), Assistant Professor of Computer Science, Ph.D. Syracuse
- Ladd, Edwin Fremont (1997), Professor of Physics, Ph.D. Harvard
- Laik, Joyaditya (2021), Sydney L. Miller Assistant Professor of Operations Management, Analytics & Operations Management, Ph.D. Pittsburgh
- Lakatos, Frank (2024), Visiting Assistant Professor of Music, Ph.D. University of Memphis
- Lam, Yan Choi (2020, 2021), Assistant Professor of Chemistry, Ph.D. California Institute of Technology
- Landsman, Rachel (2018), Assistant Professor of Economics, Ph.D. Pittsburgh
- Langford, Jeffrey (2013), Associate Professor of Mathematics, Ph.D. Washington-St. Louis
- Larrabure, Manuel (2019), Assistant Professor of International Relations, Ph.D. York
- Larson, Stephanie (2002), Professor of Classics & Ancient Mediterranean Studies, Ph.D. Texas at Austin
- Lavine, James E. (2001), Professor of Linguistics and Russian Studies, Ph.D. Princeton

- Lavine, Ludmila S. (2005), Associate Professor of Russian Studies, Ph.D. Princeton
- Lawson, Amber (2020), Assistant Professor of Practice in Accounting, M.S. Wake Forest
- Lawson, James G. (2020), Assistant Professor of Accounting & Financial Management, Ph.D. Alabama
- Leddington, Jason (2008), Professor of Philosophy, Ph.D. Southern California
- Lee, Sing Chun (2023), Assistant Professor of Computer Science, Ph.D. Johns Hopkins
- Lefebvre, Stephan (2020), Assistant Professor of Economics, Ph.D. American
- Leraul, D. Bret (2019, 2020), Assistant Professor of Comparative & Digital Humanities, Ph.D. Cornell
- Li, Lilly (2024), jane W. Griffith Faculty Fellow and Assistant Professor of Mechanical Engineering, Ph.D. Pennsylvania State University
- Lin, Carl Shu-Ming (2015), Associate Professor of Economics, Ph.D. Rutgers
- Lingo, Jordan (2023), Visiting Assistant Professor of Biology, Ph.D. Alabama-Birmingham
- Lintott, Sheila M. (2006), Professor of Philosophy, Ph.D. Wisconsin
- Lockard, Allison (2016), Associate Professor of Education, Ph.D. Pennsylvania State
- Lofgren, Erik Robert (1997), Associate Professor of East Asian Studies, Ph.D. Stanford
- Loney, Emily L. (2022), Visiting Assistant Professor of English, Ph.D. Wisconsin-Madison
- Lopez, Eddy (2016), Associate Professor of Art & Art History, M.F.A. Miami
- Lorimor, Heidi (2008), Associate Professor of Linguistics and Ruth Everett Sierzega Chair in Linguistics, Ph.D. Illinois
- Lower, Sarah (2018), Associate Professor of Biology, Ph.D. Georgia
- MacKenzie-Dawson, Sarah Kate (2006), Professor of Education, Ph.D. Pennsylvania State
- Machado Sáez, Elena (2015), Professor of English and John P. Crozer Chair of English Literature, State University of New York, Stony Brook
- Magee, Christopher S. P. (2001), Professor of Economics, Ph.D. Wisconsin
- Mair, Adam (2024), Assistant Professor of Mathematics, Ph.D. University of Alabama
- Malaga, Karlo (2019), Assistant Professor of Biomedical Engineering, Ph.D. Michigan
- Malone, Ryan M. (2014), Associate Professor of Music, Ph.D. Duke
- Malusis, Michael A. (2005), Professor of Civil & Environmental Engineering, Ph.D. Colorado State at Fort Collins
- Mamros, Elizabeth (2023), John P. and Mary Jane Swanson Fellow and Assistant Professor of Mechanical Engineering, Ph.D. New Hampshire
- Marchiori, Alan (2013), Associate Professor of Computer Science, and Electrical & Computer Engineering, Ph.D. Colorado School of Mines
- Martin, Eric C. (2010), Christian R. Lindback Chair in Business Administration and Professor of Management & Organizations, Ph.D. State University of New York, Albany
- Martin, Emily (2013), Ellen P. Williams Associate Professor in Music, D.M.A. Colorado at Boulder
- Martincich, Dustyn (2008), Professor of Theatre & Dance, Ph.D. Smith College
- Martine, Christopher (2012), David Burpee Professor of Plant Genetics and Professor of Biology, Ph.D. Connecticut
- Martínez Bachrich, Roberto E. (2024), Assistant Professor of Spanish, Ph.D. CUNY Graduate Center
- Massaro, Vanessa (2014), Associate Professor of Geography, Ph.D. Pennsylvania State
- Mastrolia, Stacy (2009), Associate Professor of Accounting, Ph.D. Tennessee
- McCabe, Katharine F. (2023), Assistant Professor of Women's & Gender Studies, Ph.D. Illinois-Chicago
- McCloskey, Jason (2008), Associate Professor of Spanish, Ph.D. Indiana
- McConville, Kelly (2024), Associate Professor of Mathematics, Ph.D. Colorado State University
- McDayter, Ghislaine Gaye (1997), Professor of English, Associate Provost for Research & Creative Inquiry, Ph.D. Duke
- McGrath, Karen (2018), Assistant Professor of Accounting & Financial Management, Ph.D. Reading
- McGuire, Molly M. (2003), Associate Professor of Chemistry, Ph.D. Wisconsin
- McKinney, Collin (2007), Professor of Spanish, Ph.D. Cambridge
- McLain, Karline M. (2005), Professor of Religious Studies, Ph.D. Texas at Austin
- McNamara, Peter (2006), Professor of Mathematics, Ph.D. Massachusetts Institute of Technology
- McTammany, Matthew E. (2003), Professor of Biology, and Environmental Studies & Sciences, Ph.D. Virginia Polytechnic Institute and State University
- Meek, William R. (2021), Campbell Rutledge Jr. and Eleanor Rutledge Professor of Management and Entrepreneurship, Management & Organizations, Ph.D. Louisville
- Melnikova, Anya (2024), Visiting Assistant Professor of Psychology, Ph.D. Pennsylvania State University
- Meinke, Scott R. (2002), Professor of Political Science, Ph.D. Ohio State
- Meiser, Joseph (2009), Associate Professor of Art & Art History, M.A. Ohio
- Mena, Jasmine (2016), Associate Professor of Psychology, Ph.D. Rhode Island
- Mendiratta, Shruti (2024), Visiting Assistant Professor of Chemistry, Ph.D. National Taiwan University
- Mercado, Julie (2024), Assistant Professor of Accounting, Ph.D. University of Connecticut

- Midkiff Jr., Robert McKinley (1987), Vice President for Strategic Initiatives, Associate Professor of Education, Ph.D. Arizona State
- Mineart, Kenneth (2017), Associate Professor of Chemical Engineering, Ph.D. North Carolina State
- Mir, Darakhshan (2015), John P. & Mary Jane Swanson Professor in Engineering & the Sciences and Associate Professor of Computer Science, Ph.D. Rutgers
- Miskioglu, Elif Eda (2015), Associate Professor of Chemical Engineering, Ph.D., Ohio State
- Mitchel, Aaron (2011), Associate Professor of Psychology, Ph.D. Pennsylvania State
- Mitchell, David (2003), Associate Professor of Political Science and International Relations, Ph.D. Syracuse
- Mitsch, Chris (2024), Visiting Assistant Professor of Computer Science, Ph.D. University of California Irvine
- Morales, Paolo (2024), Visiting Assistant Professor of Art & Art History, MFA Rhode Island School of Design
- Mulligan, Adrian N. (2002), Professor of Geography, Ph.D. Arizona
- Murphy, Lenora (2022), Assistant Teaching Professor of Russian Studies, Ph.D. Stanford
- Murray, Joseph Lawrence (1994), Associate Professor of Education, Ph.D. Michigan State
- Myers, Kevin P. (2001), Professor of Psychology, Ph.D. Duke
- Newlin, Jessica (2004), Associate Professor of Civil & Environmental Engineering, Ph.D. Pennsylvania State
- Ngo, Christine (2018), Associate Professor of Economics, Ph.D. University of London
- Nguyen, Jen (2023), Assistant Professor of Philosophy, Ph.D. Harvard
- Nicholls, Curtis (2009), Kiken Family Chair in Management and Associate Professor of Accounting, Ph.D. Colorado at Boulder
- Nickel, Robert M. (2007), Associate Professor of Electrical Engineering, Ph.D. Michigan
- Norton, Terri R. (2018), Professor of Civil & Environmental Engineering, and Associate Dean for Student Success & Strategic Initiatives, College of Engineering, Ph.D. Florida A&M
- Nuñez, Sophia (2024), Visiting Assistant Professor of Spanish, Ph.D. Princeton
- Oduro Appiah, Joseph (2023), Assistant Professor of Geography, Ph.D. Northern British Columbia
- Okolie, Jude (2024), Assistant Professor of Chemical Engineering, Ph.D. University of Saskatchewan
- Olson, Caitlyn (2023), Josephine Hildreth Detmer & Zareen Taj Mirza Assistant Professorship in Islamic Studies, Ph.D. Harvard
- Omer Cender, Ozlem (2023), Assistant Professor of Economics, Ph.D. The New School for Social Research
- O'Neill, Greg (2022), Assistant Professor of Mechanical Engineering, Ph.D. Massachusetts Institute of Technology
- Orr, James Joseph (1994), Associate Professor of East Asian Studies, Ph.D. Stanford
- Osei, Cassie (2022), Assistant Professor of History, Ph.D. Illinois Urbana-Champaign
- Osgood-Zimmerman, Aaron (2022), Assistant Professor of Statistics, Ph.D. Washington
- Paine, James E. (2023), Assistant Professor of Analytics & Operations Management, Ph.D. Massachusetts Institute of Technology
- Paliulis, Leocadia V. (2007), Herbert L. Spencer Professor in Biology, Associate Dean of Faculty, Natural Sciences & Mathematics, Ph.D. Duke
- Paparcone, Anna (2009), Associate Professor of Italian, National Endowment for the Humanities Chair in the Humanities, Ph.D. Cornell
- Pareek, Ankur (2022), Holmes Associate Professor of Finance, Ph.D. Yale
- Patiño, Ana Mercedes (2000), Associate Professor of Spanish, Ph.D. California at Riverside
- Paudel, Nawaraj Sharma (2023), Visiting Assistant Professor of Economics, Ph.D. Southern Illinois-Carbondale
- Pearson, James (2018), Assistant Professor of Biology (non-tenure track), Ph.D. Washington in St. Louis
- Penniman, John David (2015), Associate Professor of Religious Studies, National Endowment for the Humanities Chair in the Humanities, Ph.D. Fordham
- Perez-Zetune, Elena (2023), Consortium for Faculty Diversity Dissertation Fellowship, Ph.D. Texas-Austin
- Perrone, Lisa A. (2013), Associate Teaching Professor of Italian Studies, M.A. Middlebury
- Perrone, Luiz Felipe (2003), Professor of Computer Science, Ph.D. College of William and Mary
- Peterson, Jean (1990), Associate Professor of English, Ph.D. Pennsylvania
- Pizzorno, Marie Catherine (1996), Professor of Biology and Cell Biology/Biochemistry, Ph.D. Johns Hopkins
- Ponnuswami, Meenakshi (1991), Associate Professor of English, Ph.D. Illinois at Urbana-Champaign
- Porcelli, Apollonya Maria (2022), Assistant Professor of Sociology & Anthropology, Ph.D. Brown
- Pouchet, Jessica (2019), Assistant Professor of Environmental Studies & Sciences, Ph.D. Northwestern
- Powell, Jacob A. (2022), Assistant Professor of Economics, Ph.D. Missouri
- Prince, Michael Joseph (1989), Professor of Chemical Engineering, Ph.D. California-Berkeley
- Ptacek, John Thomas (1993), Professor of Psychology, Ph.D. Washington
- Putman, Bradley James (2022), Professor of Civil & Environmental Engineering, Richard E. Garman Dean of the College of Engineering, Ph.D. Clemson
- Raymond, Timothy M. (2002), Professor of Chemical Engineering, Ph.D. Carnegie Mellon
- Reed, Susan A. (2000), Associate Professor of Women's & Gender Studies and Anthropology, Ph.D. Brown

- Reeder, DeeAnn M. (2005), Professor of Biology, Ph.D. California-Davis
- Reynolds, Ryan N. (2023), Visiting Assistant Professor of Mathematics, Ph.D. Oklahoma
- Riley, Alexander Tristan (2000), Professor of Sociology, Ph.D. California at San Diego
- Rivera, Vernan (2024), Assistant Professor of Accounting, Ph.D. University of Connecticut
- Rock, Jason Lee (2022), Professor of Practice in Military Science-LTC, M.S. Naval Postgraduate School
- Roehm, Michelle (2024), Professor of Markets & Innovation Design, Kenneth W. Freeman Dean of the Freeman College of Management, Ph.D. Northwestern University
- Rogovin, Or (2012), Silbermann Family Associate Professor of Modern Hebrew Language & Literature, Ph.D. Washington
- Rojas, David (2013), Associate Professor of Latin American Studies, Ph.D. Cornell
- Rosenberg, Robert A. (2005), Margaret Hollinshead Ley Professor in Poetry and Creative Writing, M.F.A. Iowa
- Roseth, Nicholas (2019), Assistant Professor of Music, Ph.D. Indiana
- Ross, Anne Spencer (2021), Assistant Professor of Computer Science, Ph.D. Washington-Seattle
- Rothman, Roger I. (2003), Samuel H. Kress Professor of Art History, Ph.D. Columbia
- Rovnyak, David (2003), Professor of Chemistry, Ph.D. Massachusetts Institute of Technology
- Roy, Anurag (2024), Assistant Professor of Mechanical Engineering, Ph.D. University of California Berkeley
- Ryan, Nathan C. (2007), Professor of Mathematics, Ph.D. Dartmouth
- Saucier, P. Khalil (2016), Professor of Critical Black Studies, Ph.D. Northeastern
- Salyards, Kelly A. (2006), Associate Professor of Civil & Environmental Engineering, Ph.D. Pennsylvania State
- Sammells, Clare (2009), Associate Professor of Sociology & Anthropology, Ph.D. Chicago
- Santanen, Eric L. (2000), Associate Professor of Management, Ph.D. Arizona
- Scapellato, Joseph (2015), Associate Professor of English, M.F.A. New Mexico State
- Schmid, Todd (2024), Assistant Professor of Computer Science, Ph.D. University College London
- Schneider, Geoffrey Eugene (1995), Professor of Economics, Ph.D. North Carolina at Chapel Hill
- Scholnick, Jonathan (2019), Visiting Assistant Professor of Anthropology, Ph.D. Arizona
- Schreiner, Frank (2016), Howard I. Scott Executive in Residence and Associate Professor of Managerial Practice, M.B.A. Rutgers
- Schwob, Natalie (2024), John P. and Mary Jane Swanson Fellow and Assistant Professor of Psychology, Ph.D. Pennsylvania State University
- Scott III, William Lewis (2020), Assistant Professor of Mechanical Engineering, Ph.D. Princeton
- Searles, Edmund (2002), Professor of Anthropology, Ph.D. Washington
- Seskir, Sezi (2015), Associate Professor of Music, M.A. Cornell
- Shields, James Mark (2006), Professor of Comparative Humanities, Ph.D. McGill
- Siegel, Nathan (2011), Heinemann Family Professor in Engineering and Professor of Mechanical Engineering, Ph.D. Virginia Polytechnic Institute and State University
- Siewers, Paul (Alfred) K. (2002), Associate Professor of English, Ph.D. Illinois at Urbana-Champaign
- Sills, Deborah L. (2013), Claire W. Carlson Chair in Environmental Engineering and Associate Professor of Civil & Environmental Engineering, Ph.D. Cornell
- Slater, Matthew (2009), Professor of Philosophy and John Howard Harris Chair in Philosophy, Ph.D. Columbia
- Sloboda, Andrew R. (2013), Assistant Professor of Mechanical Engineering, Ph.D. Michigan
- Slodounik, Rebekah (2018), Assistant Professor of German Studies, Ph.D. Virginia
- Smart, Shanike (2024), Assistant Professor of Economics, Ph.D. SUNY Binghamton
- Smith, Brian J. (2016), Assistant Professor of Chemistry, Ph.D. Stanford
- Smith, Hiram L. (2014), Associate Professor of Spanish, Ph.D. Pennsylvania State
- Smith, Nathan E. (2022), Visiting Assistant Professor of Biology, Ph.D. Arizona State
- Smith, Ron J. (2013), Associate Professor of International Relations, Ph.D. Washington
- Smith, Sarah (2018), Assistant Professor of Chemistry, Ph.D. California-San Diego
- Smolka, Linda B. (2004), Professor of Mathematics, Ph.D. Pennsylvania State
- Snyder, Ryan (2009), Robert L. Rooke Chair in the Historical & Social Context of Engineering, Associate Professor of Chemical Engineering, Ph.D. California at Santa Barbara
- Soleimani, Leila (2023), Assistant Professor of Management & Organizations, Ph.D. Calgary
- Solomon, Thomas Herbert (1993), Professor of Physics, Ph.D. Pennsylvania
- Spiro, Mark D. (1998), Associate Professor of Biology, Ph.D. Georgia
- Stanciu, Alia C. (2007), Associate Professor of Analytics & Operations Management, Ph.D. Pittsburgh
- Stauffer, Ryan (2020), Assistant Professor of Finance and Perricelli Faculty Fellow, Ph.D. Calgary
- Stayton, C. Tristan (2005), Professor of Biology, Ph.D. Chicago

- Stedem, Kelly (2022), Assistant Professor of Political Science, Ph.D. Brandeis
- Stevenson, Jennifer Rice (2010), Associate Professor of Psychology, Ph.D. North Carolina at Chapel Hill
- Stewart, Anthony F. (2013), Professor of English and Associate Dean of Faculty, Arts & Humanities, Ph.D. Queen's University
- Stockland Jr., Robert A. (2000), Professor of Chemistry, Ph.D. Missouri at St. Louis
- Stone-Bury, Lisa (2024), Assistant Professor of Psychology, Ph.D. University of Colorado
- Stoudt, Sara (2021), Assistant Professor of Statistics, Ph.D. California-Berkeley
- Stough, Joshua (2016), Associate Professor of Computer Science, Ph.D. North Carolina at Chapel Hill
- Stowe, Emily (2004), Associate Professor of Biology, Ph.D. Missouri
- Street, Daniel (2020), Assistant Professor of Accounting & Financial Management, Ph.D. Alabama
- Strein, Timothy George (1992), Professor of Chemistry, Ph.D. Pennsylvania State
- Stuhl, Andrew (2013), David & Patricia Ekedahl Professor in Environmental Studies and Associate Professor of Environmental Studies & Sciences, Ph.D. Wisconsin-Madison
- Sulai, Ibrahim A. (2015), Associate Professor of Physics & Astronomy, Ph.D. Chicago
- Suslava, Kate (2018), Associate Professor of Accounting, Ph.D. Rutgers
- Switzer, Rebecca L. (2014), Associate Professor of Chemistry, Ph.D. Michigan
- Takahashi, Mizuki (2011), Associate Professor of Biology, Animal Behavior, Ph.D. Memphis
- Talmage, Edward (2018), Assistant Professor of Computer Science & Engineering, Ph.D. Texas A&M
- Tardio, Katie (2023), Assistant Professor of Classics & Ancient Mediterranean Studies, Ph.D. North Carolina-Chapel Hill
- Temkin, Daniel (2019), Samuel L. Williams Assistant Professor of Music, D.M.A. Southern California
- Thompson, Michael S. (2007), Associate Professor of Electrical & Computer Engineering, John P. & Mary Jane Swanson Professor in Engineering & the Sciences, Ph.D. Virginia Polytechnic Institute and State University
- Thomson, Jennifer C. (2013), Associate Professor of History, National Endowment for the Humanities Chair in the Humanities, Ph.D. Harvard
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Joel Moersch, MBA, Sr. Associate AD, Revenue Generation & Strategic Advancement
Carly Moss, M.S., Sr. Associate AD, Strategic Initiatives & Leadership
Linda Smolka, Ph.D., Professor of Mathematics, NCAA Faculty Athletics Representative

ABOUT THE CATALOG

Abbreviations & Codes

Code	Subject
ACFM	Accounting & Financial Management
ANOP	Business Analytics
ANBE	Animal Behavior
ANTH	Anthropology
ARBC	Arabic Studies
ARTD	Art & Design
ARTH	Art History
ASTR	Astronomy
BICH	Cell Biology/Biochemistry
BIOL	Biology
BMEG	Biomedical Engineering
BPHY	Biophysics
CBST	Critical Black Studies
CEEG	Civil & Environmental Engineering
CHEG	Chemical Engineering
CHEM	Chemistry
CHIN	Chinese Language
CLAS	Classics & Ancient Mediterranean Studies
COLL	College Major
CSCI	Computer Science
CSEG	Computer Science & Engineering
DANC	Dance
DATA	Data Science
DLCL	Languages, Cultures & Linguistics
EAST	East Asian Studies
ECEG	Electrical & Computer Engineering
ECON	Economics
EDUC	Education
ENCW	Creative Writing
ENFS	Film/Media Studies
ENGR	Engineering
ENLS	Literary Studies
ENST	Environmental Studies
FOUN	Foundation Seminar
FREN	French & Francophone Studies
GEOG	Geography
GEOL	Geology & Environmental Geosciences
GREK	Greek
GRMN	German Studies
HIST	History
HLTH	Health Humanities
HUMN	Comparative Humanities
IDPT	Interdepartmental
IREL	International Relations

ITAL	Italian Studies
JAPN	Japanese Language
LAMS	Latin American Studies
LATN	Latin
LING	Linguistics
MATH	Mathematics
MECH	Mechanical Engineering
MECO	Mathematical Economics
MGMT	Management
MIDE	Markets, Innovation & Design
MILS	Military Science
MORS	Management & Organizations
MUSC	Music
NDPT	Non-departmental
NEUR	Neuroscience
NTST	Nontraditional Study
OCST	Off-campus Studies
PHAS	Physics & Astronomy
PHIL	Philosophy
PHYS	Physics
POLS	Political Science
PSYC	Psychology
RELI	Religious Studies
RESC	Residential College
RETH	Race & Ethnicity Studies
RUSS	Russian Studies
SIGN	Sign Language, American
SOAN	Sociology & Anthropology
SOCI	Sociology
SPAN	Spanish
THEA	Theatre
THDN	Theatre & Dance
UNIV	University Course
WMST	Women's & Gender Studies

Courses numbered below 200 are elementary and introductory courses; those numbered from 200 to 299 are more advanced, usually based upon prerequisites fulfilled either in secondary school or college; courses numbered 300 and above are advanced courses usually having prerequisites at the college level.

Previous Catalogs

Previous years can be downloaded below.

2024-2025 Course Catalog for the Class of 2028 HMTL or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2024-2025.pdf) (12,595 kb)

2023-2024 Course Catalog for the Class of 2027 HTML (https://coursecatalog.bucknell.edu/archive/2023-2024/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2023-2024.pdf) (6,894 kb)

2022-2023 Course Catalog for the Class of 2026 HTML (https://coursecatalog.bucknell.edu/archive/2022-2023/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2022-23_Catalog.pdf) (5,939 kb)

2021-2022 Course Catalog for the Class of 2025 HTML (https://coursecatalog.bucknell.edu/archive/2021-2022/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2021-22_Catalog.pdf) (6,539 kb)

2020-2021 Course Catalog for the Class of 2024 HTML (https://coursecatalog.bucknell.edu/archive/2020-2021/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2020-21.pdf) (6,431 kb)

2019-2020 Course Catalog for the Class of 2023 HTML (https://coursecatalog.bucknell.edu/archive/2019-2020/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2019-20.pdf) (6,762 kb)

2018-2019 Course Catalog for the Class of 2022 HTML (https://coursecatalog.bucknell.edu/archive/2018-2019/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2018-19.pdf) (3,891kb)

2017-2018 Course Catalog for the Class of 2021 HTML (https://coursecatalog.bucknell.edu/archive/2017-2018/) or PDF (https://coursecatalog.bucknell.edu/pdf/2017-18.pdf) (4,238 kb)

2016-2017 Course Catalog for the Class of 2020 HTML (https://coursecatalog.bucknell.edu/archive/2016-2017/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2016-17.pdf) (4,460 kb)

2015-2016 Course Catalog for the Class of 2019 HTML (https://coursecatalog.bucknell.edu/archive/2015-2016/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2015-16.pdf) (5,230 kb)

2014-2015 Course Catalog for the Class of 2018 HTML (https://coursecatalog.bucknell.edu/archive/2014-2015/) or PDF (https://coursecatalog.bucknell.edu/aboutcatalog/previouscatalogs/2014-15.pdf) (5,230 kb)

2013-2014 Course Catalog (https://www.bucknell.edu/Documents/catalog/Catalog13_14.pdf) for the Class of 2017 (1,765 kb)

2012-2013 Course Catalog (https://www.bucknell.edu/Documents/catalog/Catalog12_13.pdf) for the Class of 2016 (1,588 kb)

2011-2012 Course Catalog (https://www.bucknell.edu/Documents/catalog/Catalog11_12.pdf) for the Class of 2015 (2,094 kb)

2010-2011 Course Catalog (https://www.bucknell.edu/Documents/catalog/Catalog10_11.pdf) for the Class of 2014 (1,636 kb)

2009-2010 Course Catalog (https://www.bucknell.edu/Documents/catalog/Catalog09_10.pdf) for the Class of 2013 (1,700 kb)

2008-2009 Course Catalog (https://www.bucknell.edu/documents/catalog/BucknellCatalog08-09.pdf) for the Class of 2012 (1,517 kb)

2007-2008 Course Catalog (https://www.bucknell.edu/documents/catalog/BucknellCatalog07-08.pdf) for the Class of 2011 (1,618 kb)

2006-2007 Course Catalog (https://www.bucknell.edu/documents/catalog/BucknellCatalog06-07.pdf) for the Class of 2010 (1,712 kb)

2005-2006 Course Catalog (https://www.bucknell.edu/documents/catalog/BucknellCatalog05-06.pdf) for the Class of 2009 (1,581 kb)

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