CHEMISTRY (CHEM)

CHEM 105. Introduction to Chemistry. 1 Credit.
Offered Fall Semester Only; 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. Prerequisite: seniors by permission only.

CHEM 160. Introduction to Environmental Chemistry. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:3
One semester terminal course in chemistry. Introduction to the basic chemistry principles that govern natural processes and anthropogenic effects on the environment. Satisfies laboratory science requirement for Bachelor of Arts students not majoring in science or engineering. Crosslisted as ENST 160.

CHEM 201. General Chemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Other:5
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. Credit not given for both CHEM 201 and CHEM 221.

CHEM 202. General Chemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:4
A continuation of CHEM 201 with a focus on equilibrium, thermodynamics, kinetics, and acid-base chemistry. Laboratory experiments emphasize quantitative procedures. CHEM 201 is a prerequisite for CHEM 202. Credit not given for CHEM 202 and CHEM 221 or CHEM 231.

CHEM 211. Organic Chemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:4,Other:5
First-year, first-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: high school chemistry or equivalent.

CHEM 212. Organic Chemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:4,Other:5
A continuation of CHEM 211 with focus on properties and reactions of functional groups, synthesis, and spectroscopic analysis. Prerequisite: CHEM 211.

CHEM 221. Inorganic Chemistry I. 1 Credit.
Offered Fall Semester Only; Lecture hours:2,Other:4
Introduction to structures and reactivity of inorganic systems. Introductory thermodynamics and kinetics. Emphasizes hands-on, experiential learning in workshops and laboratory. Prerequisite: CHEM 212 or permission of the instructor.

CHEM 222. Accelerated General Chemistry: Inorganic. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Other:5
Atomic structure and introductory quantum mechanics. Molecular structure and theories of bonding. Introductory thermodynamics and kinetics. Introduction to coordination chemistry. Laboratory: introduction to quantitative techniques. Prerequisite: Chemical Engineering students. All others by permission of the instructor.

CHEM 231. Analytical Chemistry. 1 Credit.
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 221 or CHEM 222.

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 Either Fall or Spring; 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 Either Fall or Spring; Lecture hours:4,Recitation:2
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. Prerequisites: CHEM 211 and CHEM 212. Crosslisted as CHEM 614.

CHEM 317. Special Topics in Organic Chemistry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4; Repeatable
Available by independent study. Prerequisites: CHEM 212 and permission of the instructor.

CHEM 322. Inorganic Chemistry II. 1 Credit.
Offered Spring Semester Only; Lecture hours:3,Lab:4
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 231. Crosslisted as CHEM 622.

CHEM 327. Special Topics in Inorganic Chemistry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4; Repeatable
Topics vary. Available by independent study. Prerequisite: CHEM 221. Crosslisted as CHEM 627.

CHEM 332. Analytical Chemistry II. 1 Credit.
Offered Fall Semester Only; Lecture hours:3,Lab:4
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 Either Fall or Spring; Lecture hours:4
Available by independent study. Prerequisite: CHEM 231 and 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 211. 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
Introductory physical chemistry with emphasis on thermodynamics, kinetics and electrochemistry. Prerequisites: CHEM 231, MATH 211, and PHYS 212. Not open to engineering majors. 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, MATH 211, PHYS 211. Only open to engineering majors.

CHEM 347. Special Topics in Physical Chemistry. 1 Credit.
Offered Either Fall or Spring; Lecture hours:4
Available by independent study. Prerequisites: CHEM 231 and 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 231 or CHEM 202. 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 Either Fall or Spring; Lecture hours:3,Other:1
Structure/function relationships and dynamics of biomolecules. Prerequisite: permission of the instructor.

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 205 and CHEM 351 and permission of the instructor. Crosslisted as BIOL 340.

CHEM 360. Advanced Environmental Chemistry. 1 Credit.
Offered Fall Semester Only; Lecture hours:4
Chemistry of the atmosphere, hydrosphere, and lithosphere. Natural processes and anthropogenic effects will be discussed. Prerequisite: 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.

CHEM 371. Chemistry Lecture Series. .25 Credits.
Offered Both Fall and Spring; Lecture hours:1; Repeatable
Formal oral presentations on current research will be given by students, faculty and visiting scientists. Prerequisites: participation in an approved research project or independent study for seniors or second term juniors only.

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 Both Fall and Spring; Lecture hours:2; Repeatable
Topics vary. Crosslisted as CHEM 685.

CHEM 386. Seminar. .5 Credits.
Offered Both Fall and Spring; Lecture hours:2; Repeatable
Topics vary. Crosslisted as CHEM 686.