

# COMPUTER SCIENCE (CSCI)

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## **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 in the context of creativity and examining problems of social good. Students will create visual artifacts that will empower them to investigate, and draw novel insights from, data that may be social, historical, or textual in nature. Supplemented with discussions on computing's impact on society.

## **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. Prerequisites: sophomore Computer Science major or 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 CSCI sophomore majors or permission of the instructor.

## **CSCI 203. Introduction to Computer Science. 1 Credit.**

**Offered Either Fall or Spring; Lecture hours:3,Lab:2**

Overview of computing that explores relationships between computer organization, various programming approaches, limits to computing, and computing in society. Students solve computational problems using Python.

## **CSCI 204. Data Structures & Algorithms (formerly Intro to Computer Science II). 1 Credit.**

**Offered Either Fall or 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 permission of the instructor. Corequisite: MATH 201 or equivalent.

## **CSCI 205. Software Engineering and Design. 1 Credit.**

**Offered Either Fall or Spring; Lecture hours:3**

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 206. Computer Organization. 1 Credit.**

**Offered Spring Semester Only; Lecture hours:3,Lab:3**

Concepts of software and hardware. Software: instruction set design, assembly language and assemblers. Hardware: processor organization, memory hierarchy, interfacing processors and I/O devices. Prerequisite: CSCI 204 or permission of the instructor.

## **CSCI 208. Programming Language Design. 1 Credit.**

**Offered Spring Semester Only; 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.

## **CSCI 240. Computers and Society. .5 Credits.**

**Offered Spring Semester Only; Lecture hours:2**

The place of computers in society. In-depth study of societal, ethical, and legal issues related to computing. Historical and futurists' views of computing and technology. Public perceptions of computing and the role of computer scientists as professionals. Course work includes oral and written presentations. Prerequisite: junior or senior standing.

## **CSCI 245. Life, Computers, and Everything. 1 Credit.**

**Offered Spring Semester Only; Lecture hours:3,Other:2**

This course explores how computing technologies fit into modern life and provides opportunities for critical analysis of their societal impacts. Past, current, and future developments in computing are studied from ethical and legal perspectives. Course activities includes discussions, oral presentations, and written work. Fulfills CSCI 240 requirement for CS majors.

## **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: one of the following: CSCI 202, CSCI 203, CSCI 204, CSCI 205, CSCI 206, CSCI 208, CSCI 240, or 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 305. Introduction to Database. 1 Credit.**

**Offered Occasionally; Lecture hours:3**

Relational database design methodologies, evaluation techniques, programming, and query languages. Introduction to database systems design, performance, and object-oriented databases. Prerequisites: CSCI 204 and junior or senior standing.

**CSCI 311. Design & Analysis of Algorithms. 1 Credit.**

**Offered Fall Semester Only; Lecture hours:3,Recitation:1**

Introduction to the algorithms and data structures used in implementing abstract data types including priority queues, dictionaries, and graphs. Includes complexity analysis of various implementations. Prerequisites: MATH 241 and CSCI 205 or permission of the instructor.

**CSCI 315. Operating Systems Design. 1 Credit.**

**Offered Fall Semester Only; Lecture hours:3,Lab:2**

Introduction to operating system design including processor management, scheduling, memory management, resource allocation, file systems, and concurrency. Prerequisite: CSCI 206.

**CSCI 320. Computer Architecture. 1 Credit.**

**Offered Fall Semester Only; Lecture hours:3,Lab:2**

Use hardware description language to describe and design digital systems. Processor design, pipelining, cache and storage systems. Instruction and thread level parallelism, speculation, branch prediction. Prerequisite: CSCI 315 or permission of the instructor.

**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 208.

**CSCI 340. 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 ECEG 430.

**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 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.

**CSCI 363. Computer Networks. 1 Credit.**

**Offered Occasionally; Lecture hours:3,Lab:2**

Principles and design of networked computing systems and application programs. Topics include reliable communications medium access control, routing, transport, congestion control and networked applications. Prerequisite: CSCI 315.

**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 retrieval. Prerequisites: junior standing and permission of the instructor.

**CSCI 379. Topics in Computer Science. 1 Credit.**

**Offered Either Fall or Spring; Lecture hours:3; Repeatable**

Current topics of interest. Course may/may not require laboratory depending upon the topic. Prerequisite: permission of the instructor.

**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:Varies,Other:2; Repeatable**

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. Not open to students who have taken ENGR 452.

**CSCI 476. Senior Design II. 1 Credit.****Offered Spring Semester Only; Lecture hours:1.5**

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.

**CSCI 479. Computer Science Design Project. 1 Credit.****Offered Fall Semester Only; Lecture hours:3**

Students in teams use software engineering methodology to design and implement a semester-long project. Written reports and oral presentations are required. Prerequisites: CSCI 205 and senior standing in the College of Arts and Sciences and permission of the instructor.