

Computer Science

Prerequisite courses must be passed with a minimum grade of C.

LOWER DIVISION

CS 100. Critical Thinking with Computers (3). Apply critical thinking skills studying human and computer parallels, computer technology and methodology, and program development. [A-LD.]

CS 111. Computer Science Foundations 1 (4). Introductory programming covering problem decomposition, control structures, simple data structures, testing, and documentation. Students design and implement a number of programs. [Prereq: MATH 101 (C) or MATH 101i (C) or MATH 102 (C).]

CS 112. Computer Science Foundations 2 (4). Object-oriented programming, focusing on classes, instances, methods, encapsulation, inheritance, overloading, multiple inheritance, and exception handling. [Prereq: CS 111. Weekly: 3 hrs lect, 2 hrs lab.]

CS 211. Data Structures (4). Introduction to classic data structures and algorithms. Performance comparisons, big-O notation, trade-offs, arrays, linked lists, recursion, sorting, stacks, queues, trees, graphs, and hash tables. [Prereq: CS 112 and MATH 253.]

CS 212. Algorithms (4). Introduction to algorithmic thinking. Recurrences and solution techniques, fundamental algorithms including graph algorithms, algorithm design techniques, balanced trees, performance trade-offs. [Prereq: CS 211; STAT 108 (C) or STAT 108i (C), and MATH 105 or MATH 109.]

CS 232. Python Programming (3). Introduction to the Python language. Idiomatic language features such as lists, dictionaries, tuples, and sets. Use of Python classes and modules to accomplish complex tasks. [Prereq: CS 111 or IA.]

CS 235. Java Programming (3). Object-oriented programming; event handling; abstract windowing toolkit applets, applications; Java database connectivity; applications programming interface and Java doc. [Prereq: CS 112. Lecture/lab.]

CS 237. Bioinformatics Programming (3). Introductory course on using software tools to solve biological problems. Students collaboratively model genomic and/or proteomic data with scripting and statistical languages. [Prereq: CS 111 and BIOL 105.]

CS 243. Architecture (4). Introduction to computer architecture including assembly language, computer arithmetic, performance measures, datapath, control, pipelining, and memory/storage design. [Prereq: CS 112 and MATH 253. Lecture/lab.]

CS 279. Introduction to Linux (4). Introduces the UNIX/Linux family of operating systems. Basic commands, utilities, system structures, scripting and tools are explored. Elements of system administration are presented. [Prereq: CS 111. Lecture/lab.]

CS 280. Selected Topics in Computing (1-3). Special topics in computer science. [Courses with this number have only freshman/sophomore prerequisites, excluding CS 212 and CS 243. Rep.]

CS 280L. Selected Topics in Computing (1-2). Special topics in computer science. [Courses with this number have only freshman/sophomore prerequisites, excluding CS 212 and CS 243. Rep.]

UPPER DIVISION

CS 309. Computers & Social Change (3). How computers influence societal systems. Issues: privacy, employment, politics, social interaction, and risk. Group discussion and writing on selected issues. [B-UD; C-UD; D-UD.]

CS 325. Database Design (4). Introduction to database design and implementation. Relational model, entity-relationship model and diagrams, converting a model to a schema, elementary Structured Query Language (SQL), normalization. [Prereq: CS 112; or GSP 270 and (CS 111 or CS 232 or GSP 318).]

CS 328. Web-Apps Using Databases (4). Building applications atop databases. N-tiered architecture; database tier: stored procedures/functions; presentation tier: web GUIs; application tier: controlling web-to-database interactions. [Prereq: CS 325.]

CS 346. Telecommunications & Networks (4). Introduction to the fundamentals of telecommunication and to the structure, implementation, and theoretical underpinnings of computer networking. [Prereq: CS 243 and STAT 108 or STAT 108i.]

CS 374. Operating Systems (4). Introduction to operating systems with an emphasis on process synchronization and control. Synchronization, kernel structure, scheduling, deadlock, virtual and physical memory, file and I/O. [Prereq: CS 211 and CS 243. Lecture/lab.]

CS 444. Robotics (4). A project-based introduction to robotic systems and software that controls them, including gearing, mechanics, AI control systems, and problem solving with robots. [Prereq: CS 211 and STAT 108 or STAT 108i.]

CS 449. Computer Security (4). Introduction to central concepts of computer security on networked systems. Topics include threats, cryptography, authentication, operating systems in security, legal and privacy issues. [Prereq: CS 346.]

CS 458. Software Engineering (4). Introduction to software engineering principles and methodologies in the context of a semester-long software team project. [Prereq: CS 328 and CS 374.]

CS 461. Computational Models (4). An introduction to the Chomsky hierarchy, automata, Church-Turing Thesis, computability, NP-completeness, and information theory. [Prereq: CS 212, MATH 253, and MATH 105 or MATH 109.]

CS 480. Advanced Topics in Computing (1-3). Advanced topics in computer science. [Courses with this number must have as a prerequisite at least CS 211. Rep.]

CS 480L. Advanced Topics in Computing (1-2). Advanced topics in computer science. [Courses with this number must have as a prerequisite at least CS 211. Rep.]

CS 482. Internship (1-4). Supervised experience in business, governmental, or service agencies, matching theory with practice. [CR/NC. Prereq: IA. Weekly: 3 hrs per unit of credit.]

CS 499. Directed Study (1-4). Individual study on selected topics. Open to advanced students with consent of faculty sponsor and DA. [Rep by topic for a maximum of 12 units; multiple enrollments in term.]