CSCI - Computer Science/Programming

CSCI 107. Joy and Beauty of Computing. 3 Credits. (3 Lec) F
Examines the computing field and how it impacts the human condition. Introduces exciting ideas and influential people. Provides a gentle introduction to computational thinking using the Python programming language.

CSCI 111. Programming with Java I. 4 Credits. (3 Lec, 1 Lab) F,S
COREQUISITE: M 151Q. Introduction to programming: program design, analysis, and implementation in Java, including I/O, assignment, decision, iteration, scalar types, arrays, control structures, methods, classes, and common data types. No previous programming experience required.

CSCI 112. Programming with C I. 3 Credits. (2 Lec, 1 Lab) S

CSCI 132. Basic Data Structures and Algorithms. 4 Credits. (3 Lec, 1 Lab) F,S
PREREQUISITE: CSCI 111 and M 151Q. An introduction of advanced Java and basic data structures and their application in problem solving. Data structures include stacks, queues and lists. An introduction to algorithms employing the data structures to solve various problems including searching and sorting, and recursion. Understanding and using Java class libraries. The laboratory uses Java. Introduces Big-O Notation.

CSCI 215CS. Social & Ethical Issues in CS. 3 Credits. (2 Lec, 1 Rec) F
PREREQUISITE: W core and US core. Social and ethical issues as they relate to computing, including privacy, risks, computer abuse, commerce, professionalism, free speech, intellectual property, social justice, and current issues. History of computing.

CSCI 232. Data Structures and Algorithms. 4 Credits. (3 Lec, 1 Lab) S
PREREQUISITE: CSCI 132. Advanced data structures and programming techniques and their application. Topics include: trees, balanced trees, graphs, dictionaries, hash tables, heaps. Examines the efficiency and correctness of algorithms. The laboratory uses Java.

CSCI 246. Discrete Structures. 3 Credits. (3 Lec) F
PREREQUISITE: M 171Q, COREQUISITE: CSCI 132. This course covers logic, discrete probability, recurrence relations, Boolean algebra, sets, relations, counting, functions, maps, Big-O notation, proof techniques including induction, and proof by contradiction.

CSCI 290R. Undergraduate Research. 1-6 Credits. (1-6 Ind; max unlimited) F,S
Directed undergraduate research which may culminate in a written work or other creative project. Course will address responsible conduct of research. May be repeated. Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

CSCI 292. Independent Study. 1-3 Credits. (1-3 Ind; 3 cr max) On Demand
Max 12 cr. PREREQUISITE: To be determined based on actual topic offered. May be repeated. Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

CSCI 305. Concepts/Programming Languages. 3 Credits. (3 Lec) S
PREREQUISITE: CSCI 132 and CSCI 246. An examination of several programming paradigms, and languages, as well as their application and underlying execution model. Paradigms examined include imperative, object-oriented, functional, logic and string based. Students will gain exposure to a variety of languages such as C, C++, Scheme, Prolog and Perl.

CSCI 338. Computer Science Theory. 3 Credits. (3 Lec) S
PREREQUISITE: CSCI 246 and M 171Q. Formal languages, theory, automata, Turing Machines, computability, the Church-Turing thesis, computational complexity, and NP-completeness.

CSCI 351. Systems Administration. 3 Credits. (3 Lec) S
PREREQUISITE: CSCI 112 and CSCI 232. The administration and management of Linux computer systems. Includes installation, user/process management, configuration of services and device handling. A thorough knowledge of Linux/Unix command structure is required.

CSCI 361. Computer Architecture. 3 Credits. (3 Lec) F
PREREQUISITE: CSCI 112 and CSCI 232. The structure and function of computer systems: CPU, memory, I/O. Includes digital logic, data type, instruction set design, pipelining, RISC, parallel processing, and assembly language programming.
CSCI 482R. Interdisciplinary Project Instruction. 1 Credit. (1 Rcr) F, S
PREREQUISITE: Senior standing. COREQUISITE: ESOF 322 First part of a senior capstone sequence for the interdisciplinary option. Classroom instruction that prepares a student to undertake an interdisciplinary project that relates computing to the student’s minor.

CSCI 483R. Interdisciplinary Project. 3 Credits. (3 Ind) S
PREREQUISITE: Second part of a senior capstone sequence for the interdisciplinary option. Students undertake an interdisciplinary project and present their results through a written paper, a poster and an oral presentation.

CSCI 490R. Undergraduate Research. 1-6 Credits. (1-3 Ind; 12 cr max) On Demand Max 12 cr. PREREQUISITE: Consent of instructor. Directed undergraduate research which may culminate in a research paper, journal article, or undergraduate thesis. Course will address responsible conduct of research. May be repeated.

CSCI 491. Special Topics. 1-4 Credits. (1-4 Lec; 12 cr max) On Demand Max 12 cr. PREREQUISITE: To be determined based on actual topic offered. Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

CSCI 492. Independent Study. 1-3 Credits. (1-3 Ind; 6 cr max) On Demand Max 6 cr. PREREQUISITE: Junior standing, consent of instructor, and approval of department head. Directed research and study on an individual basis.

CSCI 494. Seminar. 1-4 Credits. (1-4 Sem; 4 cr max) On Demand Max 4 cr. PREREQUISITE: Junior standing and as determined by each offering. Topics offered at the upper divisional level that are not covered in regular courses. Students participate in preparing and presenting discussion material.

CSCI 495. Field Work/Practicum. 1 Credit. (1 Ind; 2 cr max) F,S Max 2 cr. PREREQUISITE: Junior standing and CSCI 232. Directed assistance to, and involvement in labs, with lower division CS students. Can only complete once.

CSCI 498. Internship. 1-6 Credits. (1-6 Ind; 6 cr max) On Demand PREREQUISITE: Junior standing, consent of instructor, and approval of department head. An individualized assignment arranged with an agency, business or other organization to provide guided experience in the field.

CSCI 520. Distributed Systems. 3 Credits. (3 Lec) S even years. PREREQUISITE: CSCI 452 and CSCI 466. The design and implementation of software systems that utilize multiple host computer networks as a foundation. Concurrency control, homogeneous and heterogeneous systems, interprocess communication, protocols and application design.

CSCI 532. Algorithms. 3 Credits. (3 Lec) S PREREQUISITE: CSCI 232. Concrete time and space complexity; combinatorial algorithms; greedy algorithms; dynamic programming; probabilistic and randomized algorithms; branch-and-bound algorithms.

CSCI 538. Computability. 3 Credits. (3 Lec) F PREREQUISITE: CSCI 358. Turing machine computability and decidability; abstract time and space complexity; intractability.

CSCI 540. Advanced Database Systems. 3 Credits. (3 Lec) F odd years. PREREQUISITE: CSCI 440 or consent of instructor. Advanced database models including spatial, temporal, and object-oriented; advanced data indexing techniques, data warehousing and query optimization.


CSCI 547. Machine Learning. 3 Credits. (3 Lec) S even years. PREREQUISITE: CSCI 446. An exposure to advanced topics from the field of artificial intelligence with an emphasis on machine learning. Example topics include Bayesian learning, evolutionary computation, and cognitive science.

CSCI 548. Reasoning Uncertainty. 3 Credits. (3 Lec) S odd years PREREQUISITE: CSCI 446 recommended. Background in probability recommended. An exploration of problem solving using structured probabilistic models. Topics in probabilistic representations, inference algorithms, and learning such models from data will be explored.

CSCI 550. Data Mining. 3 Credits. (3 Lec) F even years. PREREQUISITE: A probability or statistics course. Clustering, classification and pattern recognition; performing automated discovery of knowledge from a data set.

CSCI 551. Adv Computational Biol. 3 Credits. (3 Lec) F odd years PREREQUISITE: CSCI 452. This course examines a variety of algorithmic computational biology topics with an emphasis on elucidating new research problems.