

- CIS 443 Enterprise Database Programming and Administration (3).** Advanced ANSI SQL programming, multi-user database application development and enterprise database administration. Prerequisites: CIS 300, 343. (S)
- CIS 468 Workshop in CIS (1–3).** As announced. Prerequisites: BUS 151; consent of instructor. (May be repeated for a maximum of 3 credits.)
- CIS 489 Internship (1–3).** Minimum of eight weeks on-the-job experience related to the student's major. Daily journal and a written report relating the work experience to the student's education are required. Grading is satisfactory/unsatisfactory. Prerequisites: BUS 151; major in CIS; 3.00 GPA in CIS and related subjects; consent of instructor.
- CIS 491 Directed Study (1–3).** Independent study under instructor's guidance. Prerequisites: BUS 151; consent of instructor. (TBA)
- CIS 493 Topics in Computer Information Systems (1–3).** As announced. (May be repeated for a maximum of 6 hours with consent of advisor.) Prerequisites: BUS 151. (TBA)

## Computer Science (CS)

**Note:** Some math courses require prerequisites that can be fulfilled with satisfactory ACT/SAT scores. These minimum scores may be satisfied in the following ways:

For courses with MATH 107 as prerequisite, satisfactory scores are defined as:

1. ACT math of 24 or higher **OR**
2. ACT math of 22 or 23 **AND** an algebra/geometry subscore of 9 **OR**
3. SAT math of 530 or higher.

For courses with MATH 119 as a prerequisite, satisfactory scores are defined as:

1. ACT math of 26 or higher
2. SAT math of 600 or higher

- CS 114 Computers and Society (3).** Technical, social and ethical issues in computing. Topics may include e-mail etiquette, World Wide Web search strategies, computer viruses, encryption, copyright, privacy, free speech and the limits of computing. (S)
- CS 123 Programming Fundamentals (3).** Concepts and programming techniques fundamental to the practice and theory of computer science: I/O, operators and expressions, control structures, functions, and arrays. Prerequisite: MATH 107 or satisfactory ACT/SAT score. (F, S)
- CS 134 Intermediate Programming (3).** Object-oriented programming, APIs, recursion, references, searching and sorting. Prerequisites: CS 123; either MATH 119 or satisfactory ACT/SAT score. (F, S)
- CS 220 Mathematical Foundations of Computer Science I (3).** Logic, methods of proof, mathematical induction, elementary set theory, functions and relations. Prerequisites: Either MATH 119 or satisfactory ACT/SAT score. (F)
- CS 257 Data Structures (3).** Specification, implementation and analysis of object-oriented linear and tree structures. Prerequisite: CS 134. (F)
- CS 268 Workshop in Computer Science (1–3).** As announced. (May be repeated for a maximum of 6 hours.)
- CS 288 Cooperative Education (1–3).** Practical experience at a cooperating institution. Prerequisite: consent of instructor.
- CS 293 Topics in Computer Science (1–3).** As announced. (May be repeated for credit.)

- CS 301 Programming Language Concepts (3).** General concepts underlying the design and implementation of programming languages. Introduction to programming paradigms. Prerequisite: CS 134; recommended CS 257. (S)
- CS 320 Mathematical Foundations of Computer Science II (3).** Counting, analysis of algorithms, recurrence relations, graph theory. Prerequisites: CS 123, 220. (S)
- CS/EET 340 Microprocessors and Assembly Programming (3).** Programming and use of microcomputer hardware to perform basic and advanced control functions. Topics include architecture and instruction set of microprocessors, timing diagrams, address decoding schemes and interrupt handling. Prerequisite: EET 241/241L or CS 123. (F)
- CS 342 Computer Architecture (3).** Fundamental concepts in the design of digital computers. I/O, arithmetic-logic unit, control unit and the memory hierarchy. Prerequisite: CS/EET 340. (S)
- CS 360 Object-Oriented Development (3).** Object-oriented design, event-driven programming, computer graphics, GUI design, Java API, human-computer interaction, design patterns, documentation and testing. Prerequisite: CS 134. (F)
- CS 404 Automata, Languages, and Computability (3).** Basic concepts from finite automata, context free languages, Turing machines and computability. Prerequisites: CS 257, 320. (F)
- CS/MATH 409 Numerical Analysis I (3).**
- CS/MATH 410 Numerical Analysis II (3).**
- CS 415 Software Engineering (3).** Software engineering principles including life-cycle models, specification, design and verification. Students will work in teams on a large project. Prerequisites: CS 257, 360.
- CS 451 Design and Analysis of Algorithms (3).** Techniques for analyzing performance of algorithms; principles and concepts of algorithm design. Prerequisites: CS 257, 320. (S)
- CS 457 Database Theory (3).** Theory of databases, including physical organization, conceptual design, relational database theory and SQL. Prerequisites: CS 257, 320. (TBA)
- CS 461 Operating Systems (3).** Theory of operating systems. Topics include processes, file systems, memory management and I/O. Prerequisites: CS 257, 340. (S)
- CS 462 Computer Networks (3).** Structure, implementation, theoretical underpinnings and applications of computer networking. Topics may include network structures and architecture, protocols, error handling, security, routing, compression. Prerequisites: CS 134, 340; MATH 124.
- CS 468 Workshop in Computer Science (1–3).** As announced. (May be repeated for a maximum of 6 hours.)
- CS 470 Compiler Design (3).** Theory and practice of compiler design. Scanning, grammars, parsing, semantics, intermediate representations, code generation. Prerequisites: CS 257, 301, 340.
- CS 488 Cooperative Education (1–3).** Practical experience at a cooperating institution. Prerequisite: consent of instructor.
- CS 491 Directed Study (1–3).** Independent study. (May be repeated for a maximum of 4 hours.) Prerequisite: consent of instructor.
- CS 493 Topics in Computer Science (1–3).** As announced. (May be repeated for credit.)