

DESCRIPTION OF UNDERGRADUATE COMPUTER SCIENCE COURSES (CSCI)

1001. Introduction to Computer Science (3) (F,S) May not count towards a BA or BS degree in computer science, or towards foundations curriculum credit. Elementary treatment of some basic ideas in computer science, such as how computers store and process data, binary and hexadecimal numbers, arithmetic/logic instructions, social issues, data structures, web pages, and the Internet. Targeted towards novice computer users.

1002. Web Page Programming (3) (F,S) May not count toward CSCI major or minor. Introduction to the enhancement of web pages using programming techniques. Provides supervised practical experience in the use of an embedded programming language. A portable computer is required.

1200. Introduction to Visual Programming (3) (F,S) May not count toward CSCI major or minor. P: MATH 1065. Introduces programming using a visual design tool such as Visual Basic.

2300. Computer Science Survey (3) (F,S) Elementary architecture, operating systems, file systems, network, algorithmic, and software development concepts.

2310, 2311. Algorithmic Problem Solving and Programming Laboratory (4,0) (F,S) P: MATH 1065; C for 2310: CSCI 2311; C for 2311: CSCI 2310. Design of algorithms and their implementation as programs in high-level language such as Java.

2427. Discrete Mathematical Structures (3) (F,S) Same as MATH 2427 May not count toward MATH major or minor. May receive credit for only one of CSCI 2427; MATE or MATH 2775, 3237, or MATH 2427. P: MATH 1065 or 1066. Study of discrete mathematical structures. Special emphasis on structures most important in computer science. Practical applications of subject emphasized.

2600. Introduction to Digital Computation (3) (S) May not count toward CSCI major or minor. P: MATH 1065 or 1066. Emphasis on algorithmic approach to problem solving. Algorithms programmed and run on computer by all students.

2618. COBOL (3) (F) P: CSCI 2310 or 2610. Basic and advanced elements of COBOL.

3200. Data Structures and Their Applications (4) (F) P: CSCI 2310, 2311. Common data structures and how to use them in advanced problem solving.

3300. Introduction to Algorithms and Data Structures (4) (F,S) P: CSCI 2310; C: CSCI 2427. Advanced data representations such as lists and trees, including associated algorithms and use of both static and dynamic memory.

3310. Advanced Data Structures and Data Abstraction (3) (F,S) P: CSCI 2427, 3300. Data abstractions such as stacks, queues, graphs, tables, and sets, and implementations in object-oriented style, including principles of class design.

3526. Switching Theory and Computer Organization (3) (F,S) P: CSCI 2310, 2427. Theory and practice of computer and computer component design. Gates and gate-level design.

3573. Introduction to Numerical Analysis (3) (S) Same as MATH 3573 P: CSCI 2310 or consent of instructor; MATH 2119 or 2172 or equivalent. Algorithms suitable for digital computation in areas of linear algebra, linear programming, slope finding, area finding, and nonlinear equation solution.

3584. Computational Linear Algebra (3) (F,S) Same as MATH 3584 May not count toward MATH major or minor. P: Calculus course. Introduces vectors, matrices, and determinants. Special emphasis on application of linear algebra to solution of practical problems.

3601. Computer Organization and Programming (3) (F,S) P: CSCI 3200, 3300, or 3526. Assembly language used to illustrate general machine architecture that executes assembly language command structure.

3650. Analysis of Algorithms (3) (S) P: CSCI 3200 or 3300; CSCI 2427. Decision trees, mathematical induction, and adversary arguments used to analyze correctness, complexity, and optimality of algorithms. Emphasis on searching and sorting algorithms.

3675. Organization of Programming Language (3) (F) P: CSCI 3200 or 3310. Applied course in programming language constructs. Emphasis on run-time behavior of programs. Provides appropriate background for advanced-level courses involving formal and theoretical aspects of programming languages and compilation process.

3700. Database Management Systems (3) (F,S) P: CSCI 3200 or 3310. Theory and techniques of relational, hierarchical, and network database management systems.

3800. Introduction to Computer Graphics (3) (F) P: CSCI 3200 or 3310; MATH 3256 or 3584. Computer graphics systems, hardware, interactive methods; line and curve drawing; two- and three-dimensional transformations; and perspective transformation.

4000. Senior Assessment (0) (F,S) To be taken by CSCI seniors in final semester. Assessment of departmental programs.

4200. Software Engineering I (3) (WI) (F,S) P: CSCI major and CSCI 3200 or 3310. Formal approach to state-of-the-art techniques in software design and development and application of the techniques.

4230. Software Engineering II (3) (F,S) P: CSCI 4200 or consent of the instructor. Conceptual and practical knowledge in relation to large-scale software development using established software engineering principles. Requires completion of major project using tools and methodologies provided.

4300. Systems Programming (3) (F) P: CSCI 3200 or 3310. Programming issues related to the functionality and general structure of operating systems, networking, security, and the general architecture of information systems are covered.

4510. Object-Oriented Computing and Graphical User Interfaces (3) (F,S) P: CSCI 3200 or 3310. Object-oriented program design and development and data abstraction. Object-oriented programming languages. Applications to graphical user interfaces and event-driven computing.

4520. Introduction to Computer Architecture (3) (S) P: CSCI major; CSCI 3526. Organization of basic elements of computer system, including processor, memory, control unit, and I/O units.

4530. Computer Networks and the Internet (3) (S) P: CSCI 3200 or 3300 or consent of instructor. Theory and case studies of modern networking protocols and telecommunication methods. Local area and long-haul networks.

4540. Introduction to Mobile Communications and Wireless Security (3) P: CSCI 4530 or consent of instructor. Signals, access protocols, application requirements and security issues. Focus is on digital data transfer.

4550. Computer Game Development (3) (F) P: CSCI 3200 or 3310. Content creation and the concepts behind the development of story, character, environment, level design, user interface, and sound.

4602. Theory of Automata and Linguistics (3) (F) P: CSCI major; CSCI 2427. Basic concepts of automata theory and mathematical linguistics and their close interrelationship.

4627. Procedural Languages and Compilers (3) (S) P: CSCI major; CSCI 3526, 3675. State of the art techniques for compiling procedural languages.

4630. Operating Systems I (3) (F,S) P: CSCI major and CSCI 3200 or 3300. Job control and operating systems. System organization, resource and storage allocation, interrupt handling, addressing techniques, file structures, and batch/time sharing systems.

4710. Introduction to Developing e-Business Systems (3) (WI) P: CSCI 3200 or 3310 or consent of instructor. Introduces use of concepts, technologies, and building blocks from computer science, practical software engineering, and business development in building e-Commerce systems. Describes systematic life-cycle approach to developing successful e-Commerce systems and presents knowledge essential to wide range of organization and software developers. Requires completion of major term projects using state-of-the art tools and methodologies.

4905. Selected Topics in Computer Science (3) May be repeated for maximum of 6 s.h. with change of topic. P: CSCI major and CSCI 3200 or 3310. Consideration of new or advanced topics in computer science.

5002. Logic for Mathematics and Computer Science (3) Same as MATH 5002 P: CSCI 3200 or 3310 or MATH 3223 or 2775 or MATH 2427 or 2775 or 3223 or 3256 or PHIL 3580 or equivalent. Methods of mathematical logic important in mathematics and computer science applications.

5210. Operating Systems II (3) P: CSCI 4630 or consent of instructor. Theory and practice of concurrent processes in computer operating systems. Process scheduling. Memory and auxiliary storage management.

5220. Program Translation (3) P: CSCI 4627 or consent of instructor. Formal language specification for programming languages. Advanced parsing techniques. Code generation and optimization.

5501, 5502, 5503. Independent Study (1,2,3) Minimum of 3-6 hours per week depending on the nature of the work assigned. P: CSCI 3200 or 3310 or equivalent or consent of instructor. Advanced computer science students study topics that supplement regular curriculum.

5774. Programming for Research (3) Same as MATH 5774 For graduate student who wishes to use computer science to meet required research skills in his or her dept. May not count toward MATH major or minor. P: General statistics course or consent of instructor. Emphasis on minimum-level programming skill and use of statistical packages.

5800. Artificial Intelligence (3) P: CSCI 3200 or 3310 or consent of instructor. Fundamental problems and techniques of artificial intelligence. Heuristic search. Concepts of expert systems.

Some courses which carry foundations curriculum credit are identified using the following key. Consult the offering department concerning additional courses which carry foundations curriculum credit. Courses in major prefix may not count toward foundations curriculum.

(FC:EN)=English; (FC:EX)=Exercise and Sport Science; (FC:FA)=Fine Arts; (FC:HL)=Health;
(FC:HU)=Humanities; (FC:MA)=Mathematics; (FC:SC)=Science; (FC:SO)=Social Science