

COMPUTER SCIENCE (C S)

C S 110 COMPUTER LITERACY 3 Credits (3)

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C S 111 Computer Science Principles 4 Credits (4)

This course provides a broad and exciting introduction to the field of computer science and the impact that computation has today on every aspect of life. It focuses on exploring computing as a creative activity and investigates the key foundations of computing: abstraction, data, algorithms, and programming. It looks into how connectivity and the Internet have revolutionized computing and demonstrates the global impact that computing has achieved, and it reveals how a new student in computer science might become part of the computing future. (3+2P)

Prerequisite(s): MATH 1215 or higher

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C S 117 Introduction to Computer Animation 3 Credits (3)

Introductory course for learning to program with computer animation as well as learning basic concepts in computer science. Students create interactive animation projects such as computer games and learn to use software packages for creating animations in small virtual worlds using 3D models. Recommended for students considering a minor/major in computer science or simply interested in beginning computer animation or programming.

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C S 151 C++ Programming 3 Credits (3)

Introduction to object-oriented programming in the C++ language. The focus will be on preparing students to use C++ in their own areas. No prior programming experience is required. (2+2P)

Prerequisite(s): MATH 1215 or higher

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C S 152 Java Programming 3 Credits (3)

Programming in the Java language. (2+2P)

Prerequisite(s): MATH 1215 or higher

Repeatable: up to 3 credits

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C S 153 Python Programming I 3 Credits (3)

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required.

Prerequisite(s): MATH 1215 or higher

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C S 154 Python Programming II 3 Credits (3)

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas.

Prerequisite(s): C S 153

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C S 158 R Programming I 3 Credits (3)

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used.

Prerequisite(s): MATH 1220G

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C S 171G Introduction to Computer Science 4 Credits (4)

Computers are now used widely in all area of modern life. This course provides understanding of the theoretical and practical foundations for how computers work, and provides practical application and programming experience in using computers to solve problems efficiently and effectively. The course covers broad aspects of the hardware, software, and mathematical basis of computers. Weekly labs stress using computers to investigate and report on data-intensive scientific problems. Practical experience in major software applications includes an introduction to programming, word processing, spreadsheets, databases, presentations, and Internet applications. (3+2P)

Prerequisite(s): MATH 1130G or MATH 1215 or higher

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C S 172 Computer Science I 4 Credits (4)

Computational problem solving; problem analysis; implementation of algorithms using Java. Object-oriented concepts, arrays, searching, sorting, and recursion. (3+2P)

Prerequisite(s): (A C or better in either MATH 1250G or MATH 1430G) or (A C or better in MATH 1220G and a 1 or better in the CS Placement Test)

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C S 209 Special Topics 3 Credits (3)

Repeatable: for a maximum of 12 credits

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C S 271 Object Oriented Programming 4 Credits (4)

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Pointers and dynamic memory allocation. Hands-on experience with useful development tools. (3+2P)

Prerequisite(s): At least a C- in C S 172 or ENGR 140

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C S 272 Introduction to Data Structures 4 Credits (4)

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, dequeues, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. (3+2P)

Prerequisite(s): At least a C- in C S 172, or placement

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C S 273 Machine Programming and Organization 4 Credits (4)

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. (3+2P)

Prerequisite(s): At least a C- in C S 172 or ENGR 140

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C S 278 Discrete Mathematics for Computer Science 4 Credits (4)

Discrete mathematics required for Computer Science, including the basics of logic, number theory, methods of proof, sequences, mathematical induction, set theory, counting, and functions. (3+2P)

Prerequisite(s): At least C- in C S 172

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