

CSCI: COMPUTER SCIENCE

Courses

- CSCI 103 - Computer Applications** **Credit 1**
Introduction to computer applications using programs such as Word, Excel or PowerPoint. **Note(s):** May be taken multiple times for credit with a different topic; may not be counted toward the major; may not be counted towards Core Curriculum requirements. **Grade Mode:** A.
Restriction(s): Must be Undergraduate Level.
Repeat Limit (after first attempt): 10.
- CSCI 104 - The Nature of Computing** **Credits 3**
Fundamental concepts of computers and programming applied to a selected subject from one of the following: computer graphics, computational thinking for statistics, or programming for data science. Focusing on the algorithmic aspect of quantitative reasoning in computer programming. Basic programming skills for writing small programs to accomplish useful tasks for modeling, information processing and problem solving. No prior programming experiences are assumed. Core Curriculum: Approved for Core - Mathematics. **Grade Mode:** A.
Restriction(s): Must be Undergraduate Level.
- CSCI 105 - Introduction to Computer Science** **Credits 3**
Introduction to computer hardware and software, problem solving methods, elementary concepts of algorithm development, and C++ programming. **Lecture/Lab Hours:** Three hours lecture, one hour lab.
Grade Mode: A.
Restriction(s): Must be Undergraduate Level.
- CSCI 106 - Data Structures** **Credits 3**
Linear lists, strings, arrays and orthogonal lists; graphs, trees, binary trees, multi-linked structures, searching and sorting techniques, dynamic storage allocation; applications. **Lecture/Lab Hours:** Three hours lecture, one hour lab. **Grade Mode:** A.
Prerequisite(s): CSCI 105.
Restriction(s): Must be Undergraduate Level.
- CSCI 220 - Computer Organization and Assembly Language Programming** **Credits 3**
Fundamentals of digital logic and the architecture of modern computer systems, machine level representation of data, memory system organization, structure of machine languages, and assembly language programming. **Grade Mode:** A.
Prerequisite(s): CSCI 105.
Restriction(s): Must be Undergraduate Level.
- CSCI 230 - Programming Languages** **Credits 3**
Organization and structure of programming languages; runtime behavior and requirements of programs; introduction to programming language specifications and analysis; and the study of various alternative languages, such as Java, C++ and Python. **Grade Mode:** A.
Prerequisite(s): CSCI 106.
Restriction(s): Must be Undergraduate Level.
- CSCI 305 - Programming for Data Science I** **Credits 3**
Fundamental programming skills for data science applications using a major programming language, such as Python or R in the field. Data analysis and information retrieval through data selection, iterative processing, function composition, abstraction and visualization. **Note(s):** Course may be repeated if different programming languages are used.
Grade Mode: A.
Prerequisite(s): CSCI 105 or PHSC 311.
Restriction(s): Must be Undergraduate Level.
Repeat Limit (after first attempt): 1.
- CSCI 306 - Programming for Data Science II** **Credits 3**
Advanced programming skills for data science applications using a major programming language, such as Python or R in the field. Machine learning and advanced data-science applications. **Note(s):** Course may be repeated if different programming languages are used. **Grade Mode:** A.
Prerequisite(s): CSCI 305.
Restriction(s): Must be Undergraduate Level.
Repeat Limit (after first attempt): 1.
- CSCI 311 - Operating Systems** **Credits 3**
Computer operating systems; topics include time sharing, process communication, memory management, storage allocation, interrelationships between the operating system and the architecture of computer systems. **Note(s):** Offered in Fall. **Grade Mode:** A.
Prerequisite(s): CSCI 106, CSCI 220.
Restriction(s): Must be Undergraduate Level.
- CSCI 335 - User Interface Design and Programming** **Credits 3**
User interface design, implementation, and evaluation; event-driven programming in GUI applications and web applications; user-centered design methodologies. **Grade Mode:** A.
Prerequisite(s): CSCI 106.
Restriction(s): Must be Undergraduate Level.
- CSCI 400 - Theory of Algorithms** **Credits 3**
Various types of algorithms, analytic techniques for the determination of algorithmic efficiency, NP-complete problems, complexity hierarchies, and intractable problems. **Grade Mode:** A.
Prerequisite(s): CSCI 106; MATH 203 or MATH 204.
Restriction(s): Must be Undergraduate Level.
- CSCI 402 - Database Management** **Credits 3**
Integrated database systems, logical organization, data description language (DDL), data manipulation language (DML), of hierarchical networks and relational databases, overview of selected database management systems (DBMS). **Grade Mode:** A.
Prerequisite(s): CSCI 230.
Restriction(s): Must be Undergraduate Level.
- CSCI 430 - Computer Communications** **Credits 3**
This course focuses on concepts of computer communications, local area networks, seven layers of communication protocols (with emphasis on the five-layer internet protocol stack), and global networks. Specifics related to wireless and mobile networks are incorporated as well. Also covered will be an overview of network security for the application, transport, network, and link layers. **Grade Mode:** A.
Prerequisite(s): CSCI 220, CSCI 230.
Restriction(s): Must be Undergraduate Level.

CSCI 440 - Topics in Computer Science **Credits 3**

Various topics including but not limited to the following: Compilers and Languages: Development of key compiler components based on the theory of automata and formal languages; Systems Programming: Development of utilities and shell scripts for Unix system administration; Computer Graphics: Design and implementation of 3D computer interactive graphics; Artificial Intelligence: Computational frameworks for knowledge representation, automatic reasoning, probabilistic modeling, and machine learning; Information Security: Concepts and techniques about cybersecurity and its implementation; Database Applications with Web and Mobile Interfaces; Machine Learning: Computational models for machine learning; Robotics: Fundamentals of robotics. **Note(s):** Course may be taken multiple times for credit with different content. **Grade Mode:** A.

Prerequisite(s): CSCI 230.

Restriction(s): Must be Undergraduate Level.

Repeat Limit (after first attempt): 10.

CSCI 450 - Software Engineering **Credits 3**

Concepts, principles, techniques, and documents of software engineering. Emphasis on systematic approaches to software engineering and the software life cycle. Team project required. **Grade Mode:** A.

Prerequisite(s): CSCI 230; CSCI 430 (may be taken concurrently).

Restriction(s): Must be Undergraduate Level.

CSCI 480 - Research Seminar **Credits 1-3**

Special studies in computer science. May involve participation in a Research Experience for Undergraduates (REU) or an internship in the industry if approved by the Department. **Grade Mode:** A.

Restriction(s): Must be Undergraduate Level.