COMPUTER SCIENCE COURSES

CSC 131 Introduction to Computers
Provides a general overview of the history, impact, and general use of computers. Basic computer concepts and data management are explored with emphasis on the applications of computers in the different disciplines.

CSC 132 INTRODUCTION TO COMPUTING AND PROGRAMMING CONCEPTS
This course is an overview of computer concepts, including hardware, operating systems, binary numbers, and programming logic. This course is offered for STEM and Cybersecurity majors/minors; others should enroll in CSC 131.

CSC 133 DIGITAL LOGIC
This is a study of basic concepts of the binary system, logic gates, combination logic, memory elements, sequential logic, processors and control logic design. Prerequisite: CSC 132.

CSC 135 INTRODUCTION TO PROGRAMMING
The course is a study of the programming language C++ including data types, arrays, input/output, control flow, functions, and program structure. The course covers creating and debugging projects in Integrated Development Environments. Prerequisite: CSC132.

CSC 136 ALGORITHM DESIGN I
This course covers an overview of C++ including functions, arrays, strings, classes and objects. The course adopts a simple and practical approach to describe the concepts of C++ for beginners. Prerequisite: CSC 135.

CSC 138 ALGORITHM DESIGN II
A continuation of CSC136 with focus on Object-Oriented Programming, STL, Dynamic Memory Management, Recursion, and Advanced Level Algorithm implementation. Prerequisite: CSC 136.

CSC 139 WEB DEVELOPMENT
(DESIGNATED SERVICE-LEARNING COURSE)
This course is an introduction to developing basic websites to web standards. It will provide a basic understanding of the methods and techniques of developing a simple to moderately complex website. Topics include HTML, CSS, and JavaScript. At the end of the course, students will be able to plan, design, and implement a web site using current standards and best practices. Prerequisite: None.

CSC 230 VISUAL BASIC
Course content includes an introduction to problem-solving techniques and study of Visual Basic component concepts and program development process. Programming topics in Visual Basic include analysis, design, and code development of Graphic User Interface (GUI).

CSC 231 ASSEMBLY LANGUAGE
(DESIGNATED SERVICE-LEARNING COURSE)
This is a study of assembly language for IBM PC compatible systems. Course covers registers, instruction formats, I/O coding, debugging and testing techniques. Prerequisite: CSC 132 or Permission of the Instructor.

CSC 232 FOUNDATIONS OF APP DEVELOPMENT
This course covers key computing concepts and seeks to build a solid foundation in programming with Swift. It also covers the impact of computing and apps on society, the economy, and cultures while exploring iOS app development. Lessons take students through the app design process such brainstorming, planning, prototyping, and evaluating an app of their own.

CSC 233 PROGRAMMING IN FORTRAN
The course covers programming in FORTRAN language with applications in chemistry, physics, statistics and engineering. It also includes numerical techniques and implementation of efficient algorithms. Prerequisite: CSC 135 or Permission of the Instructor.

CSC 234 THEORY OF COMPUTATIONS
(DESIGNATED SERVICE-LEARNING COURSE)
This course presents formal models of computation such as finite state automata, push down automata, and Turing Machines. Formal definitions of languages, problems, and language classes including recursive, recursively enumerable, regular, and context free languages. Proofs of program properties including correctness are emphasized. Prerequisite: CSC 132 or Permission of the Instructor.

CSC 235 FUNDAMENTALS OF APP DEVELOPMENT
In this course students build fundamental iOS app development skills with Swift and master the core concepts and practices those Swift programmers use daily. It also covers basic fluency in XCode source and UI editors. Students will be able to create iOS apps that adhere to standard practices, including the use of stock UI elements and layouts. Prerequisite: CSC 232.

CSC 236 BUSINESS PROGRAMMING
The course introduces the concepts of Business Programming. It provides the students with understanding how technology can be used to create business value and make knowledgeable decisions concerning the planning, development and implementation of information technology resources to increase organizational effectiveness and create a strategic advantage. Prerequisite: CSC 131 or CSC 132 or Permission of the Instructor.

CSC 237 JAVA PROGRAMMING
This course covers fundamental Java Programming concepts, which include Java constructs, objects and applications, exceptions, and elementary graphics and user interfaces. It also includes threads, input/output, networking, graphics manipulation, native methods, and graphical user interface design. Prerequisite: CSC 138 or Permission of the Instructor.

CSC 238 INTRODUCTION TO COMPUTER SECURITY
This course is an introduction to the theory and practice of computer security, including security policies, authentication, digital certificates, firewalls, malicious code, legal and ethical issues, and incident handling. Prerequisite: CSC 132 or Permission of the Instructor.

CSC 239 INTRODUCTION TO MULTIMEDIA COMPUTING
This course explores basic concepts of multimedia applications including text, graphics, sound, animation and the integration of these components. Topics include web page design, testing, uploading and maintaining the applications. Programming languages include HTML, CSS, and Java Script.

CSC 332 COMPUTER FORENSICS
This course covers tracking computer security violations. Topics include methods for recognizing network signatures and tracking them back to their origins, tracing methods in different operating systems, and identifying other related techniques. Prerequisite: CSC 238.

CSC 333 DATA STRUCTURES
This course covers an overview of data structures, linked lists, stacks and queues, graphs and trees. This course gives a good understanding of data structures needed at enterprise level applications. Prerequisite: CSC 138.

CSC 334 ALGORITHMS DESIGN AND ANALYSIS
The course covers good principles of algorithm design, and the fundamentals of the Analysis of Algorithm Efficiency. Topics include Brute Force and Exhaustive Search, Divide-and-Conquer, Dynamic Programming and Greedy Technique. Students will learn to apply Big O, Big Theta, and Big Omega notations to analyze time and space efficiencies of the algorithms. Prerequisite: CSC 333.

CSC 335 FILE ORGANIZATION AND PROCESSING
This course presents characteristics and utilization of a variety of storage devices. The concepts of sequential, direct, and index sequential access are discussed. Some file related algorithms and techniques are studied. Prerequisite: CSC 138.

CSC 336 ADVANCED CONCEPTS IN APP DEVELOPMENT
In this course students expand on the knowledge and skills they developed in Fundamentals of App development by creating more complex and capable apps. Students learn how to work with data from a server and explore new iOS APIs that allow for much richer app experiences such as displaying large collections of data in multiple formats. Students will be introduced to Core ML, a framework for integrating machine learning models into iOS Apps. Students will also learn about new features of the iOS SDK to continue their app developer journey. Prerequisite: CSC 235

CSC 337 COMPUTER ORGANIZATION AND ARCHITECTURE
(DESIGNATED SERVICE-LEARNING COURSE)
This course covers a multilevel view of computer systems and organization, interconnection of basic components, storage, input-output, and instruction sets. Prerequisite: CSC 133.

CSC 338 INTRODUCTION TO ARTIFICIAL INTELLIGENCE
(DESIGNATED SERVICE-LEARNING COURSE)
This course introduces principles and techniques of artificial intelligence and machine learning models. It builds up on the review for fundamental statistics and Bayesian computations. It includes investigation of algorithms for search strategies, heuristic problem-solving techniques, and concepts from robotics. The course has example applications from supervised, unsupervised, and reinforcement learning. Prerequisites: CSC 138, MATH 236.

CSC 339 DATA COMMUNICATION AND NETWORKING
This course introduces the fundamental principles of data communications and networking along with an overview of computer and network security threats. Topics include protocol architecture, TCP/IP, internet-based applications, data transmission, local area networks, wireless LANS, virtual private networks, SSL, firewalls and malware defense. Prerequisite: CSC 337.

CSC 340 WINDOWS PROGRAMMING WITH C++
This course focuses on learning .NET programming environment, Event-based programming, and Windows programming using C++ language. The course will include Microsoft Visual Studio .NET IDE, C++ language syntax, control structures, exception handling, Windows graphical user interface, Graphics and Multimedia, Files and Stream, XML, Database SQL, and ADO.NET. Prerequisite: CSC 138.

CSC 341 WEB PROGRAMMING WITH C++
This course continues learning .NET programming environment in application to Web design. The course will include Database SQL and ADO.NET, ASP.Net, Web Forms and Web Controls, ASP, .NET and Web Services. Prerequisite: CSC 340.

CSC 430 SENIOR RESEARCH AND PROFESSIONAL EXPERIENCE
The course focuses on reading, discussion, investigation, and preparation and presentation of reports on selected topics in computer science, under faculty supervision. The course also covers ethical, professional, and social responsibilities of graduates. This course can only be taken at the senior level. Prerequisite: CSC 333.

CSC 431 PROGRAMMING LANGUAGES
This is an introduction to formal languages and automatic processes; a review of basic data types and structures; control structures and data flow; and implementation of these in a variety of languages (C, C++, Lisp, Prolog, ADA, Modula-2). Prerequisite: CSC 333.

CSC 432 COMPILER THEORY
This course is a discussion of compiler techniques used in generating machine language code. Topics include scanning, parsing, code generation, optimization, and error recovery. Prerequisite: CSC 234.

CSC 433 COMPUTER SECURITY
This course will introduce the basic threats to information resources and appropriate countermeasures. The topic will cover cryptography, identification and authentication, access control models and mechanisms, multilevel database security, steganography, Internet security, and intrusion detection and prevention. Prerequisite: CSC 339.

CSC 434 DATABASE MANAGEMENT
This is the study of organization and design of database systems. Database models and fundamentals of database design are introduced. Topics include database structure and processing, with emphasis on relational database and SQL. Prerequisite: MATH 336 or Permission of the Instructor.

CSC 435 SOFTWARE ENGINEERING PRINCIPLES
(DESIGNATED SERVICE-LEARNING COURSE)
This course provides a basic understanding of software products, development life cycle, software design, implementation, project management and design complexities. Prerequisite: CSC 333.

CSC 436 OPERATING SYSTEMS
This is a basic study of computer architecture and operating systems. Topics include instruction sets, I/O and interrupt structures, addressing schemes, microprogramming, procedures implementation, memory management, system structures and evaluation, and recovery procedures. Prerequisites: CSC 138; CSC 337.

CSC 437 SENIOR CAPSTONE
This course will guide computer science students to develop a capstone project, serving as a culmination of their studies within the major. The project entails the development of a significant piece of software by a student or a student team, supervised by a designated faculty member within the department and evaluated by a faculty committee. Appropriate topics for the project may synthesize or extend ideas/results from several areas of study from coursework, or develop a topic not normally covered in the curriculum but can be approached by techniques and ideas in the team's academic background. The senior project concludes with the submission of a "product" (i.e., software). It is required of the student to submit a grammatically written paper and to defend his or her project in front of faculty and students. Prerequisites: CSC 334, CSC 336, CSC 435.

CSC 438 SIMULATION AND MODELING
This is an introduction to simulation techniques including: discrete models, queuing theory, stochastic systems, and system dynamics. Prerequisites: CSC 333; MATH 144 or MATH 336.

CSC 439 SPECIAL TOPICS IN COMPUTER SCIENCE
This course covers advanced topics in Computer Science and includes Artificial Intelligence and human-computer interfaces (HCI). Prerequisite: CSC 333 or Permission of the Instructor.