COMPUTER SCIENCE (CSC)

CSC-1010 Introduction to Computer Science (4 semester hours)
This course is an introduction to computer science and the scientific principles used in the field of computer science. Topics include hardware components and their function, file systems and directories, binary values and number systems, algorithmic problem-solving, software applications including spreadsheets and databases, and decision-making using data, including preprocessing, modeling, and analysis. Ethical issues and computer security are also covered.

CSC-1700 Introduction to Computer Programming (4 semester hours)
This course provides an introduction to computer programming, with a focus on problem solving and algorithm development using a procedural approach. Topics include basic logic structures, looping, one- and two- dimensional lists, I/O, and modularization of code. Extensive programming is required.
Co/prerequisite(s): MTH-1100 or higher.

CSC-1810-9 Selected Topics in Computer Science (Variable semester hours)
This course will address a specific area of study in computer science not already covered by other course offerings. Prerequisites vary by topic.

CSC-2150 Data Structures & Algorithms (4 semester hours)
This course is a continuation of CSC1700 with a focus on advanced data structures: stacks, queues, priority queues, linked lists, binary trees, and hash maps. Advanced coding practices, algorithm design, recursive functions, and sorting and searching techniques are studied and utilized in various programming projects. Extensive programming is required.
Prerequisite(s): CSC-1700 with a grade of "C" or better.

CSC-2200 Web Application Development (4 semester hours)
This course is an introduction to web-based software development focusing on client-side web technologies needed to build dynamic and robust websites. Topics include HTTP protocols, HTML, CSS, JavaScript and AJAX. Programming is required.
Prerequisite(s): CSC-1700.

CSC-2300 Computer Systems and Architecture (4 semester hours)
This course covers the mechanics of information transfer and representation between system components. Topics include addressing modes, CPU organization, ALU, bus structures, data organization, interrupts, input/output and instruction sets.
Prerequisite(s): CSC-1700.

CSC-2450 Operating Systems Admininstration (4 semester hours)
This course covers core principles of operating systems: process management, memory management, and file systems. Students also learn command line manipulation, shell programming, and other requirements for the administration of systems. Cloud services are also discussed. Programming is required.
Prerequisite(s): CSC-1700.

CSC-2810-9 Selected Topics in Computer Science (Variable semester hours)
This course will address a specific area of study in computer science not already covered by other course offerings. Prerequisites vary by topic.

CSC-3250 Object Oriented Software Design and Development (4 semester hours)
This course covers object-oriented programming techniques to design and develop large-scaled software solutions. Topics include design patterns, UML modeling, unit testing, encapsulation, polymorphism, persistence, and inheritance. Extensive programming is required.
Prerequisite(s): CSC-2150.

CSC-3350 Enterprise Networking (4 semester hours)
This course is an introduction to computer networking and data communications, and the skills needed to identify, lockdown, and secure a small to medium enterprise branch network. Topics include the implementation of functional networks, understanding TCP/IP protocols and cloud network, data transmission techniques, wireless networks, network topologies, and various network security protocols. This course will enhance specific skills in configuring and managing network devices, troubleshooting network problems, and developing a secure infrastructure, recognizing and mitigating security threats. This course prepares students for the CompTIA Network+ exam.
Co/prerequisite(s): CSC-2450.

Additional fee required

CSC-3400 Computer Security (4 semester hours)
This course is an introduction to the core principles of computer security. Topics include network security, database security, security auditing, data encryption, operating system security, vulnerabilities, user authentication, access control, malicious software, secure software development techniques, firewalls and intrusion detection, site security, legal and ethical security issues, and risk management.
Prerequisite(s): CSC-1700.

CSC-3510 Software Testing Verification, Validation and Quality Assurance (4 semester hours)
This course will cover both the theory and application of software testing. Types of testing include: functional, syntax, white-box based tools, code inspections including debugging, verification of program correctness, and software safety. Students will work on projects that integrate learned testing frameworks and methods of code development to develop and test existing or new code.
Prerequisite(s): CSC-2150.

CSC-3700 Advanced Web Application Development (4 semester hours)
This course focuses on full-stack web application development that includes an examination of modern client-side and server-side technologies. Topics include server-side language(s), cookies, sessions, web server configuration, deployment, security, and application architectures that require server-side and client-side rendering. Extensive programming is required.
Prerequisite(s): CSC-2200.

CSC-3810-9 Selected Topics in Computer Science (Variable semester hours)
This course will address a specific area of study in computer science not already covered by other course offerings. Prerequisites vary by topic.

CSC-3818 Selected Topics in Computer Science (0.5-17 semester hours)
This course will address a specific area of study in computer science not already covered by other course offerings. Prerequisites vary by topic.

CSC-3830 Directed Study in Computer Science (0.5-17 semester hours)
This is a course in which a student or students study on campus under the close supervision of an Aurora University faculty member. This is not "field experience," does not cover material in the regular curriculum, and is not as research and/ or independently oriented in its instructional methodology as an independent study. Descriptions of directed studies are contained in the petition by which the learning experience was approved. Students should file the Directed Study Petition prior to registration. This petition must be signed/approved by the Instructor, Department chair, and Academic Dean. Regular tuition is charged, and additional fees may apply.

CSC-4450 Programming Languages (4 semester hours)
This course explores the fundamental concepts and paradigms of programming language to better understand how they are used to solve programming problems and manipulate data. Students will learn to identify the key differences among imperative, functional, and logical programming languages, understanding their best applications in software development. Primary emphasis is on imperative languages and compiler design. Extensive programming is required.
Prerequisite(s): CSC-3250.

CSC-4500 Database Design and Implementation (4 semester hours)
This course focuses on the design and implementation of relational databases, while also introducing non-relational databases. Key topics include data modeling techniques (such as ER modeling, functional dependencies and normalization), optimization, SQL, security, triggers, stored procedures, and transaction management. Students will complete projects that involve designing a comprehensive database and developing an integrated software application.
Prerequisite(s): CSC-2150.

CSC-4810-9 Selected Topics in Computer Science (Variable semester hours)
This course will address a specific area of study in computer science not already covered by other course offerings. Prerequisites vary by topic.

CSC-4830 Directed Study in Computer Science (0.5-17 semester hours)
This is a course in which a student or students study on campus under the close supervision of an Aurora University faculty member. This is not "field experience," does not cover material in the regular curriculum, and is not as research and/ or independently oriented in its instructional methodology as an independent study. Descriptions of directed studies are contained in the petition by which the learning experience was approved. Students should file the Directed Study Petition prior to registration. This petition must be signed/approved by the Instructor, Department chair, and Academic Dean. Regular tuition is charged, and additional fees may apply.

CSC-4940 Computer Science Internship (1-4 semester hours)
An advanced academic internship experience for credit requires the student to be at least a junior in standing, although individual programs may require senior standing. The academic internship experience requires a faculty sponsor, educational criteria, and a current executed affiliation agreement and Schedule A on file. Internships can be designated as either credit/no credit or letter grade, depending on the school or program. Regular tuition is charged, and additional fees may apply.
Grading Type: Credit/No Credit

CSC-4990 Computer Science Capstone (4 semester hours)
This course involves a team-based design and development of a large-scale application from conception to deployment. The team will function as a complete software development group; beginning with requirements gathering from external users, to modeling and architecting the application, to implementation, and concluding with user acceptance testing. The course is based on the culmination of knowledge and skills of the students, in an effort to simulate a real-world application development scenario.
Prerequisite(s): CSC-3700 or CSC-3350; CSC-4500; Senior Standing.