# Computer Science (CS)

## Courses

**CS 134 Programming Fundamentals (4 Hours)**
In this introductory course, students will create interactive computer applications that perform tasks and solve problems. Students will design, develop and test object-oriented programs that utilize fundamental logic, problem-solving techniques and key programming concepts. 3 hrs. lecture, 2 hrs. lab / wk.

**CS 200 Concepts of Programming Algorithms Using C++* (4 Hours)**
**Prerequisites:** CS 134 (with a grade of "B" or higher) or CIS 142 (with a grade of "B" or higher) or CS 201 or CS 205 or MATH 241 or an appropriate score on department waiver test or department approval for prior work-related experience.

This course emphasizes problem solving using a high level programming language and the software development process. Algorithm design and development, programming style, documentation, testing and debugging will be presented. Standard algorithms and data structures will be introduced. Data abstraction and an introduction to object-oriented programming will be studied and used to implement algorithms. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.

**CS 200H HON: Concepts of Programming Algorithms Using C++* (1 Hour)**
**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**CS 201 Concepts of Programming Algorithms using C#* (4 Hours)**
**Prerequisites:** CS 134 (with a grade of "B" or higher) or CIS 142 (with a grade of "B" or higher) or CS 200 or CS 205 or MATH 241 or an appropriate score on department waiver test or department approval for prior work-related experience.

This course emphasizes problem-solving using a high level programming language and the software development process. Algorithm design and development, programming style, documentation, testing and debugging will be presented. Standard algorithms and data structures will be introduced. Data abstraction and an introduction to object-oriented programming will be studied and used to implement algorithms. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.

**CS 205 Concepts of Programming Algorithms using Java* (4 Hours)**
**Prerequisites:** CS 134 (with a grade of "B" or higher) or CIS 142 with a grade of "B" or higher) or CS 200 or CS 201 or MATH 241 or an appropriate score on department waiver test or department approval for prior work-related experience.

This course emphasizes problem-solving using a high level programming language and the object-oriented software development process. Algorithm design and development, classes and inheritance, programming style, documentation, testing and debugging will be presented. Standard algorithms and data structures will be introduced. Data abstraction and object-oriented programming will be studied and used to implement algorithms. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.

**CS 210 Discrete Structures I* (3 Hours)**
**Prerequisites:** MATH 171 or both MATH 116 and CS 134 or appropriate math assessment scores.

Upon successful completion of this course, the student should be able to use fundamental discrete mathematics as it relates to computers and computer applications. The student will be exposed to a variety of discrete mathematical topics. The course will include fundamental mathematical principles, combinatorial analysis, mathematical reasoning, graphs and trees, and Boolean logic circuits. 3 hrs. lecture/wk.

**CS 210H HON: Discrete Structures I* (1 Hour)**
**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**CS 211 Discrete Structures II* (3 Hours)**
**Prerequisites:** CS 210.

Upon successful completion of this course, the student should be able to use fundamental discrete mathematics as it relates to computers and computer applications. The student will experiment with a variety of discrete mathematical topics. The course will include fundamental mathematical principles, combinatorial analysis, mathematical reasoning, graphs and trees, and Boolean logic circuits. 3 hrs. lecture/wk.

**CS 211H HON: Discrete Structures II* (1 Hour)**
**Prerequisites:** Honors department approval.

One-credit hour honors contract is available to qualified students who have an interest in a more thorough investigation of a topic related to this subject. An honors contract may incorporate research, a paper, or project and includes individual meetings with a faculty mentor. Student must be currently enrolled in the regular section of the courses or have completed it the previous semester. Contact the Honors Program Office, COM 201, for more information.

**CS 225 Digital Logic with VHDL* (2 Hours)**
**Prerequisites:** ELEC 125.

This course introduces students to the Very High Speed Integrated Circuit Hardware Descriptive Language (VHDL) used to implement digital logic designs with programmable logic devices. Students will learn the different types of programmable logic devices and how to use an industry-standard programming environment to code designs with VHDL. 1hr. lecture & 2 hrs. instuctional lab/wk.

**CS 235 Object-Oriented Programming Using C++* (4 Hours)**
**Prerequisites:** CS 200 or CS 201 or CS 205.

This course emphasizes programming methodology and problem solving using the object-oriented paradigm. Students will develop software applications using the object-oriented concepts of data abstraction, encapsulation, inheritance, and polymorphism. Students will apply the C++ techniques of dynamic memory, pointers, built-in classes, function and operator overloading, exception handling, recursion and templates. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.

**CS 236 Object-Oriented Programming Using C#* (4 Hours)**
**Prerequisites:** CS 201.

This course prepares students to develop object-oriented, C# applications that solve a variety of problems. Students will apply object-oriented concepts including inheritance, function overloading, and polymorphism and will utilize available classes as well as design their own. Event-driven programming, Windows applications, web development, common data structures, database access, and frameworks will be presented. 3 hrs. lecture, 2 hrs. instructional lab/wk.

**CS 250 Basic Data Structures using C++* (4 Hours)**
**Prerequisites:** CS 235 OR (CS 200 and CS 210 or CS 236 or CS 255 or CIS 240 or MATH 242).

This course continues developing problem solving techniques by focusing on object-oriented styles using C++ abstract data types. Basic data structures such as queues, stacks, trees, dictionaries, their associated operations, and their array and pointer implementations will be studied. Topics also include recursion, templates, fundamental algorithm analysis, searching, sorting, hashing, object-oriented concepts and large program organization. Students will write programs using the concepts covered in the lecture. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.

**CS 255 Basic Data Structures Using Java* (4 Hours)**
**Prerequisites:** CS 205 or CS 236 or CIS 240.

This course will cover advanced programming topics using Java. Files, recursion, data structures and large program organization will be implemented in projects using object-oriented methodology. Students will write programs using queues, stacks, lists and other concepts covered in the lecture. 3 hrs. lecture, 2 hrs. lab by arrangement/wk.