COMPUTER SCIENCE MAJOR

Courses

MATH 1122 Applied Calculus II   **3 Credits**
Prerequisites: MATH 1121 or MATH 1141 or MATH 1171.
Topics in this course include: applications of the derivative, including implicit differentiation, related rates and linear approximation; integration of algebraic, transcendental and trigonometric functions; differentiation of trigonometric functions; techniques of integration; applications of the definite integral; infinite series. A graphing calculator and Wolfram Alpha are among the technologies that may be used. Students who receive credit for MATH 1142 or MATH 1172 may not receive credit for this course.

CPSC 1101 Introduction to Computing   **3 Credits**
In this course, students learn computational problem-solving techniques through the process of design, implementation, testing, and documentation using the programming language Python. The main ideas of computing are explored and students learn the most essential information about computers and technology in today's digital world and the latest computing trends and skills. Students will get an understanding of the breadth of computing as a discipline and how it exists in the world by identifying computing applications in society and exposing them to a variety of computing topics.

CPSC 1131 Fundamentals of Programming   **3 Credits**
Attributes: BUEL Business Elective, ENPC Digital Journalism Production Component
This course introduces programming constructs and techniques in a logical progression beginning with small problems and basic algorithms through larger scale programs and design. While not an object oriented course, classes and objects are used in an ancillary capacity while working on broader topics of software architecture. Complete programs will be designed, coded, and debugged in both Java and the C programming language, developing skills necessary to work with more complex software systems.

CPEG 2245 Digital Design I   **3 Credits**
Corequisite: CPEG 2245L.
An introduction to computer hardware design. Topics include: digital design principles, Boolean algebra, combinational logic design, sequential logic design, registers, counters, memory, multiplexers, finite state machines, radix conversion, and programmable logic devices. Students learn to write, implement, and simulate elementary digital design.

CPSC 2231 Programming Workshop   **3 Credits**
Corequisite: CPSC 2231L.
Prerequisite: CPSC 1131.
This course covers advanced programming concepts in one or more current object-oriented programming languages, including syntax , OOP principles, collections, and coding best practices. It prepares students for adapting to various programming environments and coding in an efficient manner. Lab work will accompany the course.

CPSC 3333 Introduction to Cybersecurity   **3 Credits**
Prerequisite: CPSC 2231.
In this course, students will be given an extensive overview of the various components of cybersecurity, including software development, operating systems, databases, and networks. Students will learn cybersecurity concepts, issues, and tools that are critical in solving problems in the computing security domain. The course will use lectures, reading assignments, and interactive lab exercises to reinforce the concepts that are introduced. Graduate equivalent: SWEG 5333.

CPSC 4314 Network Security   **3 Credits**
This course is intended for individuals who need an understanding of the client-server environment, with any emphasis on network security. The OSI Model, network concepts, and network architecture are discussed. The components that make up a network, including cabling, wiring hubs, file servers, bridges, switches, routers, network interface cards, network operating systems, and network software and hardware configurations are discussed. Network architectural concepts, wide area networks, remote access, and segmentation are discussed. Operating systems will be discussed and demonstrated. Featured is the seven-layer OSI model, the foundation of today's communication protocols. Students will work with various security protocols and configure routers and switches with security methods.

CPSC 2232 Data Structures   **3 Credits**
Corequisite: CPSC 2232L.
Prerequisite: CPSC 2231.
This course provides an in-depth exploration of fundamental and advanced data structures, focusing on their design, implementation, and application. Students will develop a strong understanding of key data structures such as linked lists, stacks, queues, trees, heaps, and graphs. The course revisits recursion and discusses algorithm efficiency. The course may also include sorting, reachability, and minimal paths in graphs and their algorithms. By the end of the course, students will have the skills to design custom data structures and apply them effectively in solving complex problems in software development and computer science.

CPSC 2232L Data Structures Lab   **1 Credit**
Corequisite: CPSC 2232.
This lab accompanies the Data Structures course for hands-on practice with course concepts.