



DEPARTMENT OF MATHEMATICS AND COMPUTER & INFORMATION SCIENCE

SYLLABUS

## **C++ IN OBJECT ORIENTED DESIGN CS3911**

**Prerequisite:** Grade of C or higher in Computer Programming II–**CS 2511** and Discrete Mathematics–**MA 3030**.

**COURSE DESCRIPTION:** This course introduces the student to object-oriented programming and design using C++ through a study of the concepts of program specification and design, algorithm development, and coding and testing using a modern software development environment. Topics covered include programming concepts, control structures, string manipulation, arrays/vectors, classes/objects, user-defined Functions, pointers, streams, inheritance, recursion, exceptions, and containers.

**COURSE OBJECTIVES:** This course introduces the programming skill development using object-oriented programming concepts using C++. It utilizes all of the skills developed in CS 2510 and CS 2511 and facilitates the students programming skills to a level where they are prepared to work on OOPs-based projects. Students will continue to use these skills in all of the courses in the computer science track.

At the end of the semester, students should be able to do the following:

1. Plan, design, implement, test and debug, and deploy a complete object-oriented software solution using C++
2. Create user-defined functions and manipulate strings and arrays.
3. Understand the importance of pointers and implement them.
4. Define recursion and apply it as a problem-solving technique.
5. Define inheritance and apply it in a software project.
6. Implement exception-handling in software projects and explain the importance.

**TEXTBOOK: ZyBooks: C++ and Object-Oriented Programming and Design**

**In addition, class notes will be made available on BrightSpace.**

## **TOPICS TO BE COVERED\***

1. Introduction to C++ & the Basic Elements of C++ (variables and assignments)
2. Control Structures (Selection and Repetition)
3. Arrays / Vectors
4. User-defined Functions
5. Objects and Classes
6. Inheritance
7. Streams
8. Pointers
9. Recursion
10. Exceptions
11. Templates
12. Containers
13. Searching and Sorting Algorithms

\* The topics may vary slightly and need to be adjusted as we move through the semester.