CSIT 211
Advanced Programming
4 Credits

Community College of Baltimore County
Common Course Outline

Description

CSIT 211 – Advanced Programming: provides skills for solving complex problems and working with advanced topics using object-oriented programming. Topics include data structures (such as lists, stacks, queues, trees, and graphs), recursion, graphical user interfaces, simple database connectivity, sorting, and searching.

Pre-requisites: A letter grade of B or higher in CSIT 210 or permission of the program director

Overall Course Objectives

Upon completion of this course, students will be able to:

1. analyze problems to determine the most appropriate data structure;
2. use an object-oriented programming language for complex problem solving;
3. develop well-written and documented programs;
4. evaluate the mathematical efficiency of algorithms;
5. examine various sorting and searching techniques;
6. analyze various abstract data types and the implementations in programming;
7. use various data structures to solve problems;
8. develop programs that can connect to a database;
9. create programs that have a graphical user interface;
10. use recursion to solve problems; and
11. explain advantages of encapsulation, inheritance and polymorphism.

Major Topics

I. Introduction to Abstract Data Types (ADT)
   a. Definition
   b. Collections
II. Recursion
III. Databases
   a. Connecting to a database
   b. Basic table manipulation
IV. ADT and implementations
   a. Lists
   b. Stacks
   c. Queues

   d. General Trees
   e. Binary Search Trees
   f. Heaps
   g. Graphs

V. Big-O Notation and Efficiency of Algorithms
   a. Definition
   b. Examples

VI. Sorting Algorithms

VII. Searching Algorithms

VIII. Object-Oriented Programming Topics
   a. Encapsulation
   b. Inheritance
   c. Polymorphism and Dynamic Binding
   d. Operations in derived classes
   e. Constructors in derived classes

IX. Advanced Graphical User Interfaces
   a. Timers
   b. Mouse events

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- Five comprehensive programming projects
- Two tests
- Comprehensive final exam or capstone programming project

Other Course Information

Many 4-year colleges recommend that students complete both CSIT 210 and CSIT 211 in sequence for transferability.

Date Revised: 12/01/2020