Common Course Outline

CMSC 144

Introduction to Programming

4 Semester Hours

The Community College of Baltimore County

Description

Introduction to Programming
Discusses data types, function, relations, algorithmic and program design, proofs of correctness, recursion, control statements, arrays, and loop structures with scientific applications. Note that there is some duplication of the material between CMSC 144 and CINS 123; upon successful completion of both CMSC 144 and CINS 123, a student will be awarded only 6 credits. Also unless a student has had prior computing experience, it is recommended that CMSC 144 be taken prior to CMSC 201.

Overall Course Objectives

Upon successfully completing the course, students will be able to:

1. analyze problems to determine appropriate programming solutions.
2. use an object-oriented or structured programming language for problem solving.
3. debug logic-based programming errors.
4. develop well-written and documented programs up to a few hundred lines in length.
5. recognize common programming structures in other languages.
6. convert input from the user or files.
7. create arrays and loops to handle large files of input and output.
8. organize code into sub procedures.
9. work in teams to develop a large program.
10. continue the study of computer science and Pascal.

Major Topics

I. Introduction to a Structured Language
   A. Syntax diagrams
   B. Use of Integrated Development Environment
II. Arithmetic Expressions
   A. Integer storage and operators
   B. Floating point arithmetic and storage
   C. Math library functions
III. Modularization
   A. Use of value and reference parameters
   B. Scope of variables
   C. Function return types
IV. Handling Text Files
   A. Reading from a text file
   B. Writing to a text file
V. Control Structures
   A. Loops: while, for, Branches:

B. If then else statements; case statements

VI. Simple Data Types
- A. Char variables
- B. Boolean variables and operators
- C. Enumerated types

VII. Data Structures
- A. One Dimensional Arrays
- B. Multi Dimensional Arrays
- C. Records

VIII. Introduction to Sorting and Searching
- A. Bubble Sort
- B. Insertion Sort
- C. Selection Sort
- D. Linear search
- E. Binary search

IX. Implementation of Abstract Data Types
- A. Data members
- B. Operations

X. Debugging Techniques
- A. Use of loop invariants
- B. Use of function or procedures, preconditions and postconditions
- C. Program tracing, testing, documentation and verification

Course Requirements

Grading: Grading procedures will be determined by the individual faculty member, will be provided the first week of class, and will include the following:

1. Computer Projects: Students will develop at least five computer programming projects, ranging from introductory labs to complex multi-layered scientific or mathematical projects. Programming time outside of class is required to complete projects.
2. At least two Tests, Exams, and/or Quizzes: Individual faculty will notify students of the testing procedures to be used.
3. Comprehensive Final Exam: The course will include a comprehensive final exam, which may include a final project.

Final Grades: Grades will be determined by individual faculty members.

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.

The Community College of Baltimore County is committed to providing a high-quality learning experience that results in growth in knowledge, attitudes, and skills necessary to function successfully as a transfer student, in a career and as a citizen. To accomplish this goal, we maintain high academic standards and expect students to accept responsibility for their individual growth by attending classes, completing all homework and other assignments, participating in class activities and preparing for tests.

We take seriously our responsibility to maintain high-quality programs and will periodically ask you to participate in assessment activities to determine whether our students are attaining the knowledge, attitudes and skills appropriate to various courses and programs. The assessment activities may take many different forms such as surveys, standardized or faculty-developed tests, discussion groups or portfolio evaluations. We ask that

you take these activities seriously so that we can obtain valid data to use for the continuous improvements of CCBC's course and programs.

Other Course Information

This course is the beginners course in the Computer Science Program at CCBC, and prepares students for CMSC 201, the first transfer course.