CS 2010: PROGRAMMING FUNDAMENTALS

Semester Hours: 3.0  
Contact Hours: 3

Coordinator: Jadwiga A. Carlson

Text: Starting Out With C++ from Control Structures to Objects

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Year: 2015

SPECIFIC COURSE INFORMATION

Catalog Description:

Problem solving and algorithm development. Basic programming concepts including elementary data types, arrays, strings, files, control structures, and functions. Searching and sorting algorithms. Testing and debugging strategies. Prerequisite: Math placement score of 32 or MATH 1200 or MATH 99 or higher. Approved for distance education.

Course type: REQUIRED

SPECIFIC COURSE GOALS

- I can explain the fundamental concepts of procedural programming.
- I can use a high-level language to write programs to solve problems.
- I can analyze problem requirements in order to understand what type of data and processes are involved in the system.
- I can design a solution using a modular approach and organize program code to implement the design.
- I can debug programs and verify that the output of a program satisfies the problem requirements.
- I can implement algorithms to search and sort an array.
- I can implement simple recursive functions.
STUDENT OUTCOMES ADDRESSED BY THIS COURSE

- B.1 Analyze a given problem, and identify and define the computing requirements appropriate to its solution
- B.2 Use current techniques, skills, and tools in computing practice
- B.3 Apply mathematical foundations, algorithmic principles, and computer science theory as appropriate in modeling and solving real-world problems
- B.5 Apply design and development principles in the construction of software systems of varying complexity
- B.7 Contribute effectively to professional teams in order to accomplish a common goal

LIST OF TOPICS COVERED

- Introduction (1 week)
  - Computers, programs, C++
  - Problem solving*
  - Algorithms*
  - Computer science as a career
- Data types and introductory concepts (2)
  - String, double, int
  - Assignment statement
  - Evaluating expressions
  - Simple I/O
  - Testing/debugging*
  - Documentation standards*
- Selection statements (2)
  - Relational and logical operators
  - If/else
- Loops (3)
  - FOR-loops
  - Algorithms: processing list of values to find total, average, largest, smallest
• Introduction to file I/O
• Functions and parameter passing (3)
• Arrays (4)
  • Algorithms: simple sorting and searching

* Emphasized throughout course