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 1210 or higher.

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*