FLORIDA ATLANTIC UNIVERSITY

COP 3014 Course Design Blueprint

Course Prefix and No.:	**COP 3014**
Course Title:	**Foundations of Computer Science**
Course Developer:	**Lofton Bullard**

Course Level Objectives
1. An ability to apply design and development principles in the construction of software systems of varying complexity.
2. Demonstrate proficency in the concepts of an object oriented programming language.
3. Demonstrate basic understanding of commonly used data types, data structures and classes in C++.
4. Develop and implement programs using principles of software development.

Unit #	Module/Unit Topic	Module/Unit Objective(s)	Assessment(s)	Lesson Content
1	Introduction to Computers and C++ Programming	1. Define components of a computer (CO#1, CO#4) 2. Define and compare top-down design, bottom-up, object-oriented design, and design in the small (CO#1, CO#2, CO#3, CO#5) 3. Define coding, testing executing, and debugging a program (CO#1, CO#2, CO#3, CO#4)	• MyProgrammingLab (1:1-3) • Quiz 1 (1:1-3)	• Chapter 01 • Chapter 01 Slides • Videos
2	C++ Basics and Flow of Control	1. Define and review simple data types (integer, real, character, boolean) in C++ (CO #1, CO#2, CO#3, CO#4) 2. Define and review flow of control constructs (CO#3)	• MyProgramming Lab (2:1-2) • Quiz (2:1-2)	• Chapter 02 • Chapter 02 Slides • Videos
3	Flow of Control	1. Use flow of control constructs to implement logic into programs (CO#3, CO#4)	• MyProgramming Lab (3:1) • Programming Assignment 1 (3:1) • Quiz 3 (3:1)	• Chapter 03 • Chapter 03 Slides • Videos
4	Procedural Abstraction and Functions that return value	1. Review and use top-down design to develop programs (CO#1, CO#2, CO#3) 2. Implement user (programmer) defined (CO#1, CO#2, CO#3) 3. Define scope names in a program (CO#4) 4. Define and use procedure abstraction (CO#4)	• MyProgrammingLab (4:1-5) • Quiz 4 (4:1-3, 4:5)	• Chapter 04 • Chapter 04 Slides • Videos

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		5. Define and use function name overloading (CO#1, CO#2, CO#3, CO#4)		
5	Functions for ALL Subtasks	1. Define and use void functions (CO#3, CO#4) 2. Define and use the call-by-reference mechanism to pass parameters (CO#1, CO#2, CO#3, CO#4) 3. Define and use procedure abstraction in programs (CO#1, CO#2, CO#3, CO#4) 4. Use testing and debugging technique to build correct software (CO#1, CO#2, CO#3, CO#4)	• MyProgrammingLab (5:1-4) • Quiz 5 (5:1-4)	• Chapter 05 • Chapter 05 Slides • Videos
6	I/O Streams as an Introduction to Objects and Classes	1. Define and use streams and basic file I/O inside programs (CO#1, CO#2, CO#3, CO#4)	• MyProgrammingLab (6:1) • Programming Assignment 2 (6:1) • Quiz 6 (6:1)	• Chapter 06 • Chapter 06 Slides • Videos
7	Arrays	1. Define and implement arrays (CO#03, CO#04) 2. Define and use arrays in functions (CO#01, CO#03, CO#04) 3. Implement programs that use arrays (OC#01, CO#02, CO#03, CO#04)	• MyProgrammingLab (7:1-3) • Quiz 7 (7:1-3)	• Chapter 07 • Chapter 07 Slides • Videos
8	Strings	1. Review C-styles strings (CO#03) 2. Introduce and define the C++String Class (CO#01, CO#02, CO#03, CO#04) 3. Introduce and define the C++ STL Vector Class (CO#01, CO#02, CO#03, CO#04)	• MyProgrammingLab (8:1-3) • Quiz 8 (8:1-3)	• Chapter 08 • Chapter 08 Slides • Videos
9	Pointers and Dynamic Arrays	1. Define and implement programs that use pointers (CO#01, CO#03, CO#04) 2. Define and implement programs that use dynamic arrays (CO#01, CO#03, CO#04)	• MyProgrammingLab (0:1-2) • Quiz 9 (9:1) • Programming Assignment 3 (9:1-2)	• Chapter 09 • Chapter 09 Slides • Videos
10	Defining Classes	1. Review the structure data type (CO#3) 2. Develop and define classes (CO#1, CO#2, CO#3, CO#4) 3. Develop and use ADTs to define classes (CO#1, CO#2, CO#03, CO#04) 4. Define, discuss and apply inheritance	• MyProgrammingLab (10:1-4) • Quiz 10 (10:1-4)	• Chapter 10 • Chapter 10 Slides • Videos
11	More on Friends, Overloaded Operators, and Arrays in Classes	1. Develop and implement programs that use static and dynamic arrays in classes (OC#01, CO#02, CO#03, CO#04)	• MyProgrammingLab (11:1) • Quiz 11 (11:1)	• Chapter 11 • Chapter 11 Slides • Videos

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12	Separate Compilations, and Namespaces	1. Apply preprocessor directives in programs (CO#1) 2. Implement separate compilations of files (CO#1, CO#02, CO#04) 3. Apply the using class to define namespaces in programs (CO#01, CO#02, CO#03, CO#04)	• MyProgrammingLab (12:1-3) • Quiz 12 (12:1-3)	• Chapter 12 • Chapter 12 Slides • Videos
13	Recursion	1. Define recursion (CO#04) 2. Design and implement recursive algorithms to solve programming problems (CO#01, CO#02, CO#03, CO#04)	• MyProgrammingLab (13:1-2) • Quiz 13 (13:1-2) • Programming Assignment 4 (13:1)	• Chapter 14 • Chapter 14 Slides • Videos
14	Templates	1. Design and implement programs that use function and class templates (CO#01, CO#02, CO#03, CO#04)	• MyProgrammingLab (14:1) • Quiz 14 (14:1)	• Chapter 17 • Chapter 17 Slides • Videos
15	Linked List	1. Define and implement singly linked lists (CO#1, CO#02, CO#03, CO#04)	• MyProgrammingLab (15:1) • Quiz 15 (15:1) • Programming Assignment 5 (15:1)	• Chapter 13 • Chapter 13 Slide • Videos