CSC118 Introduction to Programming two

COURSE CODE: CSC118

COURSE TITLE: Introduction to Programming II

COURSE SESSIONS: There will be two classroom sessions of 75 minutes each plus use of web and email based instruction. A 50 minute tutorial will also be made available.

CREDITS: 4

COURSE DESCRIPTION:
This second course in programming represents a continuation of the basic language features and elementary problem solving of the course Introduction to Programming I. Criteria for well-formed problem definitions are examined and increasingly sophisticated problem solving strategies are explored as more advanced programming elements are introduced. Recursion is introduced and compared to iterative solutions in terms of program efficiency and program simplicity. Data files of more complex types, the use of pointers, dynamic structures, and basic data types are introduced. Top-down development of programming solutions as well as concepts in program modularity are further emphasized. The processes of program documentation, production, testing and maintenance are exemplified. This course establishes a foundation for professional programming and software engineering design skills.

PRE-REQUISITES: CSC117

TEXT: Problem solving with C++, third edition, Savitch (Purchase is optional but recommended as a reference.)

COURSE OVERVIEW:
This course will use C++ as a language tool, and will therefore start with introducing this language and the program production software for this environment. The course will develop problem solving strategies and program production techniques through examples and assignments that require increasingly complex data structures and algorithms.

The course is divided into four sections: a) reading/writing simple C++ programs, b) classes and objects, c) pointers and data structures, d) recursion. Students should note that this course is no longer "modular" – a student who does not pass the course will be required to repeat the entire course.

COURSE OBJECTIVES:
Students will be able to:
1. Write and debug complex programs in C++
2. Use a variety of problem solving strategies to arrive at appropriate algorithms and data structures in several application areas
3. Produce well documented and tested programs
4. Use classes and objects appropriately.

5. Implement problem solutions that involve pointers and linked lists
Use recursion appropriately in problem solutions.

CONTENT (TOPIC) OUTLINE:
Part I. Introduction: Programming in C++
       Compiling and debugging
       Loops, arrays, files
       Structures, functions
Part II. Classes and Objects
       Declarations of classes, member functions
       Constructor and friend functions, operator overloading
Part IV. Pointers and Linked Data Structures
       Stacks and queues
       Ordered queues
Part V. Recursion
       Tree searching

TEACHING AND LEARNING METHODS:
Concepts will be presented in class and extensive examples given. Further examples will be provided on the Web. Reading assignments of web materials and examples will review and provide reference information. Discussions will provide practice in critical thinking, expression and communication. Dialog over email and the BBS will supplement and replace some class time. Assistance will be provided in a tutorial and by using email and telephone.

STUDENT RESPONSIBILITIES:
Students must attend class sessions. (Students may be excused from classes and take the course entirely online by prior arrangement or with permission from the instructor.)
Students must study the course notes and other materials, complete assignments in a timely manner and submit results.
Students will be expected to ask questions of the instructor in class and by email.
Students will be expected to submit drafts of assignments to get assistance.
Students must either attend testing sessions on a UVI campus or arrange for approval of a test proctor and site.

METHOD OF EVALUATION:
Assignments   45%
Tests   55%

It should be noted that solutions to assignments will be posted soon after they are due and assignments submitted after the solution is presented cannot be given a grade. Alternate assignments and makeup tests will only be given for medical or serious personal problems.

REFERENCES
On-line C++ Information:
http://www.ecst.csuchico.edu/~juliano/C++/res-txt.html

Online Book
Object-Oriented Software in ANSI C++, Michael Smith, McGraw-Hill, 2000
Additional C++ Books:
Teach yourself C++, Herbert Schildt, McGraw-Hill 1995.
The C++ Programming Language, Special Edition, Bjarne Stroustrup, 2000.
Addison-Wesley Publishing, Inc., Reading, Massachusetts
C++ From the Ground Up, 2/e Herbert Schildt, 1998.
 Osborne McGraw-Hill, Berkeley, California
C++: The Core Language, Gregory Satir and Doug Brown, 1995.
O'Reilly & Associates, Inc., Sebastopol, California