**Course**
ENGR 22100 – C and C++ Programming for Engineers

**Replacement Course**
CS 22700 – C and C++ Programming for Engineers

**Type of Course**
Required for all undergraduate engineering programs

**Catalog Description**
Introduction to programming in C and C++ to solve engineering problems: integer and floating-point data, standard mathematics library, control structures, pointers, user-defined functions, arrays, input and output, classes.

**Credits**
2

**Contact Hours**
2

**Prerequisite Courses**
ENGR 101 and ENGR 121

**Corequisite Courses**
None

**Prerequisites by Topics**
Introduction to programming

**Textbook**

**Course Objectives**
To introduce C and C++ programming to students and to develop their ability to solve engineering problems with the computer

**Course Outcomes**
Students who successfully complete this course will have demonstrated an ability to:
1. use C/C++ to solve elementary engineering problems. *(a, e, k)*
2. understand and apply concepts unique to C/C++, including increment/decrement operators and abbreviated assignment operators. *(a, e, k)*
3. use of arrays and pointers. *(a, e, k)*
4. develop function-oriented programs. *(a, e, k)*
5. distinguish between call-by-reference and call-by-value in function references and proper application of both. *(a, e, k)*
6. implement conditional statements and loops in C/C++. *(a, e, k)*
7. understand the object-oriented concept of classes and access control mechanism for class members. *(a, e, k)*

**Lecture Topics**
1. Introduction, Definitions, C program development cycle, C
program structure, Problem solving methodology, Data types, Constants and variables, Arithmetic operators

2. Standard Input/Output, Mathematical functions, Structured programming, Conditional expressions, Selection statements (if, if/else, switch), Loop structures (while, do/while, for loops)

3. File Input/Output, User-defined functions, Arrays/matrices

4. Pointers

5. Introduction to C++, Object-oriented programming, C++ program structure, Classes

**Computer Usage**

High

**Laboratory Experience**

None

**Design Experience**

None

**Coordinator**

Elizabeth Thompson, Ph.D.

**Date**

10 May 2011