

METROPOLITAN STATE UNIVERSITY OF DENVER
Office of Academic and Student Affairs

REGULAR COURSE SYLLABUS

College of: Professional Studies

Department: Engineering and Engineering Technology

Prefix & Course Number: CPE 2350 Crosslisted With*: _____

Course Title: C Programming for Engineer

Transcript Course Title (30 characters): C Programming for Engineer

Check All That Apply: Required for Major: X Required for Minor: _____ Specified Elective: _____
Required for Concentration: _____ Elective: _____ Service Course: _____

To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliance with this definition.

Federal Credit Hour Definition: A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:
(1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practica, studio work, and other academic work leading toward to the award of credit hours. 34CFR 600.2 (11/1/2010)

Credit Hours: 3 (3+0) Schedule Type: L Grade Mode: L

Face-to-Face or Equivalent Hours per course:

Lecture 45 Lab _____ Internship _____ Practicum _____ Other (please specify type and hours): _____

Additional Student Work Hours per course: 90

Variable topics umbrella course: No X Yes _____ If yes, number of credits/repeats allowed _____

Specified repeatable course: No X Yes _____ If yes, number of credits/repeats allowed _____

Prerequisite(s): MTH 1400 or (MTH 1110 and MTH 1120) or higher level math course (with a grade of "C" or better for all prerequisites)

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

APPROVED:

Department Chair OR Program Director Date

Dean OR Associate Dean Date

Associate VP, Academic and Student Affairs Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Prefix and Course Number:

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Banner Enforced Coding:

Prerequisite(s): MTH 1400 or (MTH 1110 and MTH 1120) or higher level math course (with a grade of "C" or better for all prerequisites)

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Registration restrictions: Level _____ Class _____ Program/Major _____ Student attribute _____

Catalog Course Description:

This is an advanced-level programming course using the C programming language. Methods for solving circuit and electronics problems using the C programming language are studied. The fundamental of UNIX Operation System and shell scripts are also introduced.

Specific Variable Topics Course Description (if applicable, umbrella course description included above):

Required Reading and Other Materials will be equivalent to:

Cheng, Harry H., (2009) *C for Engineers and Scientists: An Interpretive Approach*. New York, NY: McGraw-Hill.

Kernighan, Brian W., and Ritchie, Dennis, (1988) *C Programming Language (2nd Edition)* (Optional reading book), Prentice-Hall.

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Analyze and solve basic engineering problems
2. Decompose a problem into a flowchart of constituent tasks and decisions
3. Write and run programs in the C Programming language using variables, arrays, strings, files, flow control statement, recursion and pointers
4. Create top-down designs and construct modular programs using functions, parameters, local variables, and scope rules
5. Develop solutions for topical problems
6. Identify and correct program errors using standard debugging methods
7. Understand the basic concepts of UNIX system, write simple Makefile and Shell scripts.
8. Develop a sense of proper programming style in the C idiom, and will be exposed to cross-platform portability issues

Detailed Outline of Course Content or Outline of Field Experience/Internship (experience, responsibilities and supervision):

- I. Structured Programming Using C
 - A. Concepts
 - B. Applications
- II. Data Structures
- III. Arithmetic and Logic
 - A. Pointers
 - B. Operations
- IV. Conditional, branching and control flow
- V. Subprograms

- VI. Library
 - A. Math Functions
 - B. PC Libraries
 - C. Third party engineering libraries (i.e. National Instruments CVI Library)
- VII. Numerical Methods
 - A. Sorting
 - B. Searching
- VIII. Circuit Applications
 - A. Series Circuits
 - B. Parallel Circuits
 - C. Series-Parallel Circuits
- IX. Electronics Applications
 - A. Analysis of Circuits Containing
 - 1. Resistors
 - 2. Inductors
 - 3. Capacitors
 - 4. Combinations of Above
 - B. Design
 - 1. Filters
 - 2. Oscillators
- X. Efficient Programming
 - A. Multiple Indirection
 - B. Bit-Structures and Units
 - C. Indexing vs. Address
- XI. Introduction to UNIX System
 - A. Concepts of UNIX System
 - B. Makefile
 - C. Shell scripts

Evaluation of Student Performance:

1. Examinations
2. Programming Assignments
3. Team and individual projects