

EGR 126

Computer Programming for Engineers

COURSE OUTLINE

Co-requisites:

MTH 116 or equivalent

Course Description:

Introduces computers, their architecture and software. Teaches program development using flowcharts. Solves engineering problems involving programming in languages such as FORTRAN, PASCAL, or C++. Lecture 3 hours per week.

Course Goals and Objectives:

1. Introduce computer architecture
2. Examine the evolution of computer software languages
3. Introduce the steps in program development
4. Examine the basic structures of computer programming
5. Introduce object-oriented programming
6. Develop a working knowledge of C++ and its application to engineering problem solution

Semester Credits: 3 Credits Lecture Hours: 3 Hours Lab/Recitation Hours: 0 Hours

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273



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Course Outcomes

At the completion of this course, the student should be able to:

1. Understand basic computer architecture
2. Understand basic binary mathematics
3. Examine the range of computer programming languages
4. Understand the professional computer software design process
5. Understand and use the tools available for computer software programming
6. Understand and use computer software programming structures including class structures in C++
7. Write C++ programs using its range of programming structures
8. Debug C++ programs
9. Understand how to translate engineering applications into C++ programs



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Required Materials:

Textbook, Microsoft Word and Dev-C++ Editor/Compiler

Textbook:

C++ for Engineers and Scientists, 4th Edition, ISBN-13: 978-1-133-18784-4
(ISBN-10: 1-133-18784-6)

The following supplementary materials are available:

1. Dev-C++ (5.0 beta 9.2 (4.9.9.2)(9.0MB) with Mingw/GCC 3.4.2) available on line and in computer labs
2. Word software available in computer labs (.doc or .docx files)



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Topical Description:

Week	Topic	Text	Tests
1	Preliminaries	Chapter 1	
2	Problem Solving Using C++	Chapter 2	
3	Assignment, Formatting, and Interactive Input	Chapter 3	
4	Selection Structures	Chapter 4	Test 1
5	Repetition Statements	Chapter 5	
6	Modularity Using Functions	Chapter 6	
7	Arrays	Chapter 7	
8	I/O Streams and Data Files	Chapter 8	Test 2
9	Completing the Basics	Chapter 9	
10	Pointers	Chapter 10	
11	Introduction to Classes	Chapter 11	
12	Adding Functionality to Your Classes	Chapter 12	Test 3
13	Structures	Chapter 13	
14	Bit Operations	Chapter 15 (online)	
15	Review		
	FINAL EXAM		



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Notes to Instructors:

1. This course includes a capstone software project for all students.
2. Three tests and a final exam are provided.
3. Software exercises are performed in class during the semester to emphasize major software topics.
4. Homework is submitted electronically to Blackboard on a weekly basis.

