ENGR200 16

Course Summary

Course : ENGR200 **Title :** Introduction to Engineering and Computing
Length of Course : 16
Prerequisites : ELEN100 **Credit Hours :** 3

Description

Course Description: This course provides an overview of the engineering profession and introduces the student to writing computer programs. The course provides information about different engineering disciplines and gives an overview of electrical engineering. The APUS electrical engineering concentrations are introduced and it describes what career opportunities are available in those concentrations. Additional Engineering subjects are presented including Engineering Ethics and Management. The class presents the principles of structured programming using the C++ language. The course is designed for engineering students without previous programming experience. Topics include: Introductions to computers, C++ programming, classes, objects, strings, control statements, recursion, functions, arrays, vectors, and pointers. Finally, an introductory engineering design problem will be presented which gives the students an opportunity to solve a problem. Prerequisite: ELEN100.

Course Scope:

At the conclusion of this course, the student will be able to create an algorithm and code the algorithm in C++ to solve numeric problems in a variety of technical disciplines.

Objectives

After completing the course, the student should be able to accomplish these Learning Objectives (LO):

1. Summarize basic software usage in engineering disciplines
2. Describe basic C++ program structure and variables, constants, and operators
3. Demonstrate the use of classes, objects, and strings
4. Use selection structures such as if and If/else, and repetition constructs such as looping with while statements
5. Use other selection structures such as switch, and other repetition constructs such as looping with for and do-while statements
6. Create program modules using functions
7. Use arrays and vectors
8. Use pointers

Outline

Week 1: Introduction to Computers and C++

Learning Objective(s)

LO-1

Readings

Chapter 1

Assignment(s)

Week 1 introduction forum due end of week

Week 2: Introduction to Computers and C++ continued

Learning Objective(s)

LO-1

Readings

Chapter 1 continued

Assignment(s)

Weekly assignment 1 due end of week

Week 3: Introduction to C++ Programing

Learning Objective(s)

LO-2

Readings

LO-2

Assignment(s)

Weekly assignment 2 and programming exercise 1 due end of week

Week 4: Introduction to C++ Programing continued

Learning Objective(s)

LO-2

Readings

Chapter 2

continued

Assignment(s)

Weekly assignment 3 and programming exercise 2 due end of week

Week 5: Introduction to Classes, Objects and Strings

Learning Objective(s)

LO-3

Readings

Chapter 3

Assignment(s)

Quiz 1 due end of week

Week 6: Introduction to Classes, Objects and Strings continued

Learning Objective(s)

LO-3

Readings

Chapter 3

continued

Assignment(s)

Weekly assignment 4 due end of week

Week 7: Control Statements

Learning Objective(s)

LO-4

Readings

Chapter 4

Assignment(s)

Programming exercise 3 due end of week

Week 8: Control Statements continued

Learning Objective(s)

LO-4

Readings

Chapter 4

continued

Assignment(s)

Weekly assignment 5 due end of week

Week 9: Control Statements: Part 2

Learning Objective(s)

LO-3

Readings

Chapter 5

Assignment(s)

Week 9 Engineering Majors forum due end of week; Programming exercise 4 due end of week

Week 10: Control Statements: Part 2 continued

Learning Objective(s)

LO-5

Readings

Chapter 5

continued

Assignment(s)

Weekly assignment 6 and programming exercise 5 due end of week

Week 11: Functions and an Introduction to Recursion

Learning Objective(s)

LO-6

Readings

Chapter 6

Assignment(s)

Quiz 2

Week 12: Functions and an Introduction to Recursion continued

Learning Objective(s)

LO-3, LO-6

Readings

Chapter 6

continued

Assignment(s)

Weekly assignment 7 due end of week

Week 13: Arrays and Vectors

Learning Objective(s)

LO-6

Readings

Chapter 7

Assignment(s)

Week 13 Engineering Ethics forum due end of week;

Programming exercise 6 due end of week

Week 14: Arrays and Vectors continued

Learning Objective(s)

LO-6, LO-7

Readings

Chapter 7

continued

Assignment(s)

Weekly assignment 8, programming exercise 7 due end of week

Week 15: Pointers

Learning Objective(s)

LO-6, LO-8

Readings

Chapter 8

Assignment(s)

Week 15 Forum Sharing Education Goals forum due end of week; Weekly assignment 9 due end of week

Week 16: Pointers continued

Learning Objective(s)

LO-8

Readings

Chapter 8

continued

Assignment(s)

Quiz 3, weekly assignment 10,

and programming exercise 8 due end of week

Evaluation

****Instructor announcements:** Weekly announcements will appear on Monday of each week in the online classroom. The announcement will discuss the assignments for the week along with any other pertinent information for the week.

This is an introductory course; all students' work is to be presented as such in terms of quality and content. The grading system will be based on weekly forums (10%), ten weekly assignments (20%), three quizzes (30%) and eight programming exercises (40%).

Reading Assignments: Please refer to the Course Outline section of this syllabus for the weekly reading assignments.

Week 1 Introductions: Within 7 days of course start, each student must log into the classroom and introduce yourself to the class. This assignment is worth 1.25 percent of your course grade. Your response is due by Sunday of Week 1. Your response must be 250-300 words (a requirement) and include the following information.

   a. Your name
   b. Your university major or program
   c. Where you are in the program of study
   d. Your academic goals, to include why you are taking this class
   e. Information that you would like to share about yourself

Weekly Forums: We have eight (8) forums that are 1.25% each (total 10%). The Q&A weekly discussion forum is for students to post their questions on course content for that week. This forum should not be used to discuss specific quiz questions prior to receiving feedback from the instructor (after the quiz is graded). If there is a question on a specific quiz question, find a similar problem in the book and ask a question on that problem or concept. Asking specific questions on quiz questions creates an unfair advantage and defeats the purpose of the assessment tool.

Weekly Assignments: There will be ten weekly assignments during the course, each worth 2 percent of your course grade. Each weekly assignment will cover one or more chapters in the book used in this course. For all problems requiring mathematical calculations, all work must be shown.

Quizzes: There will be three quizzes, each worth 10% of your final grade. They will all be open book, open note quizzes. It will be administered without a proctor. Students must complete the numbered quiz by the end of the week indicated in the schedule.

Programming Exercises: There are eight programming exercises that must be completed in order to pass the course. Despite having completed all other requirements for the course, you must complete all of the programming exercises in order to pass the course. You must demonstrate that you are competent using the C++ programming language to build your programs.

Grading:

Name	Grade %

Materials

Book Title: C++ How to Program (Early Objects Version), 9th ed - the VitalSource e-book will be provided via the APUS Bookstore.

Author: Deitel

Publication Info: Pearson

ISBN: 9781269594738

Book Title: You must validate your cart to get access to your VitalSource e-book(s). If needed, instructions are available here - http://apus.libguides.com/bookstore/undergraduate

Author: N/A

Publication Info: N/A

ISBN: N/A

Websites
Site Name- Book Site

Website URL/Address- http://www.pearsonhighered.com/product?ISBN=0133378713

BSEE Course Materials List (Not Covered by Undergraduate Book Grant)

Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- Tutor.com offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to

exceed 5 days.

- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- "Substantive" means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says "I agree" is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

Identity Verification & Live Proctoring

- Faculty may require students to provide proof of identity when submitting assignments or completing assessments in this course. Verification may be in the form of a photograph and/or video of the student's face together with a valid photo ID, depending on the assignment format.
- Faculty may require live proctoring when completing assessments in this course. Proctoring may include identity verification and continuous monitoring of the student by webcam and microphone during testing.

University Policies

The mission of American Public University System is to provide high quality higher education with emphasis on educating the nation's military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society.

STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.