Carleton University
Department of Systems and Computer Engineering

ECOR 1606 C   *Problem Solving & Computers*   *Winter 2012*

Course Outline

Instructor:

   C. Schramm ME4444 schramm@sce.carleton.ca

Course Calendar Description:

Introduction to engineering problem solving. Defining and modeling problems, designing algorithmic solutions, converting algorithms to C programs, testing, debugging. Program style, documentation, reliability. Numeric methods: representation of data, rounding and truncation errors, root finding, curve fitting.

Course Objectives:

   The course is intended to leave students capable of writing a computer program to solve simple problems involving functional abstraction, conditions and iteration, with both simple and array data.

Instructional Resources:

- Web Site: http://www.sce.carleton.ca/courses/ecor-1606/w12
- **Required** Textbook: *Problem Solving and Program Design in C*, *Sixth Edition*, Jeri R. Hanly, Elliot B. Koffman,Addison-Wesley, 2010, ISBN-10: 0321535421.
  Printed copies can be purchased at the university bookstore. An online version of the eTextbook can be rented for 180 days from CourseSmart (www.coursesmart.com) for roughly 40% of the list price of a printed copy.
  - **Exercises from this textbook can be assigned in labs and assignments directly.**
- Further Reading: There is a large number of introductory C programming texts available, both printed and online, some of which are recommended on the Resources page of the course website. Other books used in previous years and other sections are suitable as a second source:
  - *Engineering Problem Solving with C++* by Delores M. Etter and Jeanine A. Ingber (Pearson Prentice-Hall).
  - *Problem Solving with Computers*, Bryant and Marshall. This is published by the student IEEE society and will be available for purchase from the IEEE office (ME4238).
- Consulting Service: TA's will offer a consulting service. The hours and location will be posted on the website once they are determined.

Grading Scheme:

     Lab Exams: 30%
     Written Exams: 55% (Midterm 15%, Final 40%)
     Assignments: 15%

Examinations:

   There will be laboratory tests (minimally, an early feedback exam and a lab midterm) and two written tests (a midterm and a final). In the laboratory tests, students will use computers. In the written tests, students will answer questions on paper. The written midterm will be held during class time. The final will be held during the University's examination period. *The final exam is for evaluation purposes only and will not be returned to students.* All exams will be closed book. ***No questions are allowed during any exam.*** (Item 8 of Examination Regulations, http://www5.carleton.ca/exams/rules-and-procedures/)

   Students who miss an exam will receive a mark of zero unless they have a legitimate reason for being absent and provide appropriate medical documentation dated within one day of the exam and presented to their instructor within five working days. One midterm makeup and one lab exam makeup will be offered towards the end of term to those with appropriate documentation. Those who miss the make-up will receive zero.

Labs

   Labs start on Monday, January 9th, and run until Friday, March 30th with a total of 11 lab periods. With the exception of those periods used for running the lab exams, the lab period will be used for a tutorial and

practical exercises on topics currently being covered in the lectures. The exercises will be detailed and closed problems, designed to be completed in two hours.

Lab attendance is mandatory and attendance will be taken. Your work must be submitted by the end of the lab period. TAs will be on hand to help but you are also encouraged to work *cooperatively* with your peers to complete the work. There is no mark assigned to the labs themselves so "the learning is in the doing" – there is no reason to cheat. Doing the labs is the first step in acquiring the skills that you need to pass this course and in particular the lab exams. Each lab also provides you with feedback on your progress: If you cannot complete the lab within 2 hours, you are not performing satisfactorily and require immediate remedial effort on your part.

In every lab, it is your responsibility to ensure that 1) your name is on the attendance sheet 2) the TA has a written record that s/he has seen and passed your work and 3) you have submitted your work electronically.

Assignments:

Assignments will be posted on the web site approximately bi-weekly, including the deadline and the details of the grading process. Assignments are deliberately more vague and open-ended than the labs and students are expected to spend 6-8 hours in completing the assignments. Assignments are meant to challenge your proficiency. They can and should not be completed at the last moment. Doing the assignments is the best way of raising your knowledge to the level required to pass this course.

Because assignments are designed to be worked on over the course of two-weeks, students who are sick at the time of the submission deadline should have already been working on the assignment. Those who can provide appropriate medical documentation (as for the examinations, above) will be able to submit their partial work for marking against a reduced grading scheme; others will receive zero. Consequently, please do not ask for exemptions and/or extensions because of illness. Those with long-term illnesses will be handled on a case-by-case basis.

Assignment marks are conditional upon students being able to explain their work if asked to do so. **Students who are strangely unfamiliar with what is supposedly their own work will have their marks adjusted accordingly.** Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offense that will not be tolerated. Please refer to the section on instructional offenses in the Undergraduate Calendar for additional information.

Email
As required by University regulation, students are required to consistently read their Connect email. The instructor will be using this email account to communicate important and timely messages. Not reading these emails is not a valid excuse for missing a deadline.

Emails to the instructor must be professional in nature and in writing. All emails must be from the student's Connect account, titled with the course name, and contain the student's name and number. The instructor attempts to answer all emails in a timely and helpful manner but will not reply to emails concerning matters already covered in class, on the course website or discussion groups or class emails.

Students with Disabilities:
Students with disabilities requiring academic accommodations in this course must register with the Paul Menton Centre for Students with Disabilities for a formal evaluation of disability-related needs. Registered PMC students are required to contact the Centre, 613-520-6608, every term to ensure that their instructor

receives their Letter of Accommodation, no later than two weeks before the first in-class test/midterm requiring accommodations. If you require accommodation for your formally scheduled exam(s) in this course, please submit your request for accommodation to PMC by March 7th, 2012.

Health and Safety:

Every student should have a copy of our Health and Safety Manual. An electronic version of the manual can be found at http://www.sce.carleton.ca/courses/health-and-safety.pdf

Week-by-Week Outline:

This outline is intended only a general guide to what will be covered and is subject to change.

Week	Lecture Dates	Material	Text
1	Jan 9, 11	Course Introduction	
		Computer Basics: A Hardware Introduction	Ch 1
2	Jan 16, 18	Programming Overview: Data Types, Conditionals, (while) Iteration, Library Function calls	Ch 2, 3
3	Jan 23, 25	Algorithms: Sequential, Conditions, Iteration	
4	Jan 30, Feb 1	Variables: Simple, Array and Strings	Ch 2, 7, 8.1-8.3, 9.1
5	Feb 6, 8	Conditionals	Ch 4
6	Feb 13, 15	Program Development – Testing, Debugging	Ch 5.10, 6.6
7	Feb 27, 29	Loops (**Break statement is prohibited in Section C**)	Ch 5
8	Mar 5, 7	Functions: Calling and Writing	Ch 6
9	Mar 12, 14	File Input/Output	Ch 12
10	Mar 19, 21	Practice with Loops	
11	Mar 26, 28	Practice with Arrays	Ch 8.6
12	Apr 2, 4	Practice with Calling and Writing Functions	
13	Apr 9	Review	