

**ENGR 1213 Engineering Computing**

Fall 2008

Department of Engineering and Physics

University of Central Oklahoma

<b>Location</b>	Howell Hall 118E
<b>Time</b>	MWF Noon - 12:50 p.m.
<b>Instructor</b>	Evan Lemley, Ph.D.; Prof., Department of Engineering and Physics
<b>Office</b>	Howell Hall 221L
<b>Web</b>	<a href="http://evan.lemley.org/">http://evan.lemley.org/</a>
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<b>Phone</b>	(405)974-5473
<b>Office Hours</b>	MW 10:00 – 11:00 a.m. and R 10:00 – 11:00 a.m. or by appointment.
<b>Final</b>	W Dec 10, 2008 from 11:00 a.m. - 12:50 p.m.

**Course Description**

This course focuses on the use of the *C* programming language to solve engineering problems from the algorithm development stage to program implementation stage. In this course student teams design and implement computer programs to solve engineering and related problems.

**Prerequisites**

PHY 2014 Physics for Scientists and Engineers I and Lab or concurrent enrollment in PHY 2014.

**Textbook**

*Engineering Problem Solving with C*, Dolores M. Etter, ISBN: 0-13-142971-X, Pearson-Prentice Hall, 2005.

**Objectives****Students will**

- 1) Develop algorithms and create computer programs to solve engineering or related problems.
- 2) Demonstrate an understanding of programming control structures, and input/output of data to/from these programs.
- 3) Demonstrate an understanding of multidimensional arrays and their use in engineering computing problems.
- 4) Demonstrate an understanding of the engineering design process.
- 5) Demonstrate the ability to prepare written engineering documents including reports and homework.
- 6) Demonstrate the ability to give an oral technical presentation on an engineering computing problem.

- 7) Demonstrate the ability to function as part of an engineering design team by participating in team meetings and completing assigned tasks.

### **Calculator**

For exams in this course (unless specifically indicated otherwise) you may use any calculator on the following list:

<http://www.ncees.org/exams/calculators/index.php#approved>

### **Engineering Paper**

Engineering Paper -- available from the UCO bookstore and at Thompson's Bookstore. Please use engineering paper for all handwritten homework assignments.

### **Internet & E-mail**

Access to the Internet and ability to send and receive E-mail are required for the class. If you do not have a computer at home or a laptop you can use machines on the UCO campus: Look at

<http://technology.ucok.edu/support/microcomplab.htm>

for a full list of available general use computers on campus.

Note: E-mails directed to the entire class such as class announcements will go to your official UCO e-mail address (the address that ends in *ucok.edu*).

### **Portable Electronic Devices - including cell phones/pmp's/laptops**

Please turn off any portable electronic devices during class. You may not access any portable electronic device during exams except calculators that are on the approved list.

### **Laptops**

Access to laptop computers during lectures is not prohibited. If it appears you are using your laptop for reasons other than those related to the lecture or class activities you will be asked to put the laptop away.

Abuse of this privilege could result in a complete ban of laptops in the course.

### **Instruction Techniques**

Lecture will be used two days per week and a work session will usually occur one day per week.

### **Class Polices**

- Prepare before you arrive in class by reading sections ahead of time.
- Come to class (some lecture info will be placed on the course website – which you should review as well as attend class). Attendance in lecture sessions is **very strongly recommended and VVVV!** This is not the only one way you learn, but come prepared for the session and you will learn as much as possible.
- Take notes.
- Listen carefully.

- Keep background conversation and noise to a minimum in class and lab.
- You are responsible for paying attention to all class announcements and notes. Sometimes the course web-site may not have the latest announcements.
- Attendance is mandatory for all exams or other graded activities (e.g. project competitions or presentations).
- Cheating or academic dishonesty of any kind will not be tolerated (see Code of Student Conduct – [http://evan.lemley.org/courses/2006\\_2007\\_cosc.pdf](http://evan.lemley.org/courses/2006_2007_cosc.pdf) )
- Attendance in lab sessions is required. One excused absence per semester is allowed. Please e-mail the instructor to let him know you will be gone and why within one week of the missed lab session.

### Errors

It is possible given the amount of information covered that the instructor may occasionally make a mistake in the course of a lecture or there will be either a poorly grasped or poorly explained topic. The instructor will attempt at the earliest possible opportunity to either correct the mistake or issue a different or better explanation of a particular topic.

### Lab Sessions

Much of the process of learning to write programs involves guided hands-on practice – kind of like a laboratory in other courses. So we will have about 10 lab sessions throughout the semester. The class will meet in Howell Hall 118E on the dates indicated on the course schedule in this document. There are only 14 computers in this room, so some sharing may have to occur. If you have a laptop it could be a good idea to bring it to use for these sessions.

### Homework/Team Design Project/Programming Projects

Working HW problems in a timely manner is the best way to do well on exams and in the class as a whole. Homework is due at the beginning of the class period on the due-date or due-day. Each HW problem you turn in is worth ten points. Some problems will be graded on detailed solutions and others will be graded on effort. I will **not** tell you ahead of time which or how many problems will be graded relative to a detailed solution, but on the returned and graded HW paper a check mark next to the problem number will indicate full effort (or ten points) and a numerical score (e.g. 8/10) next to the problem number will be used on those problems under more scrutiny.

### Paper Homework

Homework papers should be folded length-wise with your name written on the outside of the folded pages before turning it in. Each problem should fit all of the following criteria: clearly labeled, **one problem per sheet of paper**, legible and organized. HW papers that do not fit these criteria will be penalized accordingly. See the following link ( [http://evan.lemley.org/courses/hwk\\_format.php](http://evan.lemley.org/courses/hwk_format.php) ) for details on the presentation of HW problems.

## Electronic Assignments

These may be homework, design projects, or programming projects. What will need to be turned in will vary, but whatever documents you need to submit should be attached to an e-mail message to Dr. Lemley. File names should be distinct from other students – following is the general format for file names:

***date\_assignment\_lname.ext***

where

*date* =

current date in MMDDYY format

*assignment* =

assignment (e.g. *hwk* for a homework, *dpr* for design project, *ppr* for a programming project, *lab* for a lab assignment)

*lname* =

last name

*ext* =

file extension that indicates the type of file (e.g. *c* for program source, *xls* for a spreadsheet, *ppt* for a PowerPoint presentation, etc...)

For example if your last name is Jones, you have completed an assignment called programming project 1, you are submitting on 09/12/07, and you are submitting C source code and a related header file, then your filenames need to be:

***091207\_ppr1\_jones.c & 091207\_ppr1\_jones.h***

## Late Homework

Homework is generally due at the **beginning of class**. HW turned in after this time will have 20% deducted per late class period. For example: if a paper is turned in at 12:01 p.m. on the day it is due, 20% will be deducted. If it is turned in at 11:59 a.m. just as the next class meeting is about to begin, 20% will also be deducted. Dr. Lemley will check e-mail just before class – any electronic assignment must be received by this time, or 20% will be deducted.

## Project

There will be team design project in this course. This will incorporate some of the work you do throughout the semester into a single piece of software. You will be working in a team with other students. We will have some early exercises so you get to know your team.

**Grading Policies**

The following table shows the breakdown of credit for this course.

HW	10%
Mid-Term Exam	25%
Projects	30%
Final	35%
<b>Total</b>	<b>100%</b>

**Tentative Grading Scale**

90-100% -- A, 80-90% -- B, 70-80% -- C, 60-70% -- D, <60% -- F

**Final Exam Policy and Exam Attendance**

The final exam in this course will be comprehensive and will take place as shown in the tentative schedule included in the syllabus. In the case that a student scores higher on the final exam than their lowest regular exam, the lowest regular exam score will be replaced by the final exam score. In no event will the final exam score be discarded. Attendance for all exams is required unless an event beyond the student's control intercedes. A missed exam may be excused if the student notifies the instructor as soon as possible (before the exam occurs if possible). Official notification of the reason for the missed exam should be sent via e-mail.

**STUDENT INFORMATION SHEET / SYLLABUS ATTACHMENT**

Go to: <http://www.busn.ucok.edu/academicaffairs/StudentInfoSheet.pdf>

**DISABILITY SUPPORT SERVICES**

[http://www.ucok.edu/disability\\_support/](http://www.ucok.edu/disability_support/)

<b>ENGR 1213 Tentative Schedule for Fall 2008</b>			
<b>Week</b>	<b>Date</b>	<b>Day</b>	<b>Planned Activities</b>
1	08/18/08	Mon	Syllabus & Computer Hardware/Software and Problem Solving
	08/20/08	Wed	Text Editor & Cygwin & gcc & Linux/bash
	08/22/08	Fri	Lab Session (HOH 118E)
2	08/25/08	Mon	Basics of C – Structure, data types, assignment, I/O
	08/27/08	Wed	Math Functions & basic algorithms
	08/29/08	Fri	Lab Session (HOH 118E)
3	09/01/08	Mon	<b>NO CLASS – Labor Day</b>
	09/03/08	Wed	Algorithms – Linear Interpolation
	09/05/08	Fri	Lab Session (HOH 118E)
4	09/08/08	Mon	Standard I/O
	09/10/08	Wed	Control Structures – Structured Programming & Conditional Exp.
	09/12/08	Fri	Lab Session (HOH 118E)
5	09/15/08	Mon	Control Structures – Selection & Loops
	09/17/08	Wed	Control Structures – Selection & Loops
	09/19/08	Fri	Lab Session (HOH 118E)
6	09/22/08	Mon	File I/O
	09/24/08	Wed	Functions
	09/26/08	Fri	Lab Session (HOH 118E)
7	09/29/08	Mon	Functions
	10/01/08	Wed	Root Finding
	10/03/08	Fri	Lab Session (HOH 118E)
8	10/06/08	Mon	Recursive Functions
	10/08/08	Wed	<b>Mid-term Exam</b>
	10/10/08	Fri	Lab Session (HOH 118E)
9	10/13/08	Mon	Arrays – 1D
	10/15/08	Wed	Stats and Sorting w/ Arrays
	10/17/08	Fri	<b>NO CLASS – Fall Break</b>
10	10/20/08	Mon	Arrays – 2D
	10/22/08	Wed	Matrices, Vectors and Operations
	10/24/08	Fri	Lab Session (HOH 118E)
11	10/27/08	Mon	Pointers and Arrays
	10/29/08	Wed	Pointers and Arrays
	10/31/08	Fri	<b>Lab Session (HOH 118E) – Last Day to Drop</b>
12	11/03/08	Mon	Addresses and Pointers
	11/05/08	Wed	Pointers and Arrays
	11/07/08	Fri	Lab Session (HOH 118E)
13	11/10/08	Mon	Gauss Elim.
	11/12/08	Wed	Gauss Elim.
	11/14/08	Fri	Lab Session (HOH 118E)
14	11/17/08	Mon	Strings and String Functions
	11/19/08	Wed	Strings and String Functions
	11/21/08	Fri	Lab Session (HOH 118E)
15	11/24/08	Mon	Structures
	11/26/08	Wed	<b>NO CLASS – Thanksgiving</b>
	11/28/08	Fri	<b>NO CLASS – Thanksgiving</b>
16	12/01/08	Mon	Structures
	12/03/08	Wed	<b>Design Presentations</b>
	12/05/08	Fri	High Performance Computing
17	12/10/08	Wed	<b>FINAL – 11:00 – 12:50 a.m. HOH 118E</b>