

# 16.216: ECE Application Programming

Fall 2012

## Syllabus

### Course Meetings

Section 201: MWF 12-12:50, Kitson 301

Section 202: MWF 1-1:50, Ball 328

### Course Website

<http://mgeiger.eng.uml.edu/16216/f12>

### Course Discussion Group

All course announcements will be posted on the discussion group—you are responsible for checking the board regularly or enabling direct e-mail updates from Piazza.

Sign up link: <http://piazza.com/uml/fall2012/16216>

### Instructor

Dr. Michael Geiger

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Office: Perry Hall 118A

Phone: 978-934-3618 (x3618 on campus)

Office hours: TBD (*likely Monday, Wednesday, Thursday*)

Once finalized, my office hours are the minimum that I will be available—I will (usually) be on campus five days a week. Feel free to stop by my office, e-mail me questions, or schedule a one-on-one appointment. Office hours are subject to change.

### Textbook

K.N. King, *C Programming: A Modern Approach*, 2nd edition, 2008, W.W. Norton.

ISBN: 978-0-393-97950-3

### Course Overview

Catalog Description: Introduces C programming for engineers. Covers fundamentals of procedural programming with applications in electrical and computer engineering and embedded systems. Topics include variables, expressions and statements, console input/output, modularization and functions, arrays, pointers and strings, algorithms, structures, and file input/output. Introduces working with C at the bit manipulation level. Laboratories include designing and programming engineering applications.

Credits: 3

Prerequisites: 25.108 (Intro to Engineering II) and ECE major

### Course Overview (cont.)

Course Objectives: By the end of this course, you should understand and be able to use all of the following:

1. **Basic C Language Concepts:** constants, variables, operators, expressions and assignment statements
2. **Input and Output:** Reading data from the keyboard and displaying formatted results on the screen
3. **Flow of Control 1 – Decisions and selection:** `if` and `switch` statements
4. **Flow of Control 2 – Repetition:** `while`, `do-while`, and `for` loops
5. **Functions:** Defining and calling functions. Using arguments to pass data to a function. Using arguments to obtain results from a function. Return values.
6. **Data Structures 1:** One and two-dimensional arrays. Character strings.
7. **Data Structures 2:** Structures, collections of data components of differing types.
8. **File Input / Output:** Writing programs which obtain input from a file rather than the keyboard, and which write results to a file rather than to the screen

Grading: Grades will be computed on an A to F scale; no A+ grades will be assigned, in accordance with UMass Lowell policy. The weights assigned to the various items are:

Programming assignments	60%
Exam 1	10%
Exam 2	15%
Exam 3	15%

Incomplete grades will only be given in exceptional situations, and the student must be passing the class at the time the grade is requested.

Programming assignments: Typically, you will have one week to complete each assignment. All assignments will be graded according to the program grading guidelines, to be distributed separately. Late assignments will lose  $2^{n-1}$  points per day, including weekends and holidays. You will submit your work via e-mail directly to Dr. Geiger.

For each assignment, you will be allowed one resubmission to improve your grade without penalty. However, you must resubmit your assignment within 24 hours of your grade being posted. Note that late penalties still apply to resubmitted assignments for which the original submission is late. See the grading guidelines for more details.

Exams: Make-up exams will only be offered in exceptional circumstances. You must notify Dr. Geiger as early as possible in order to determine an appropriate make-up date.

Class participation: You are responsible for all material discussed or announced in class. You are expected to attend class regularly and participate in any in-class discussions, as such exercises are essential to your learning. Although lecture attendance is not explicitly required, regular attendance will improve your understanding of the course concepts.

### **Academic Honesty**

All assignments and exams must be completed individually unless otherwise specified. You may discuss concepts or material covered in class, but may not share any details of your solutions to assigned problems, including algorithms and code. Plagiarism (in this course, copying code from an outside source) is also unacceptable and will be treated as an instance of cheating.

Students are allowed to discuss assignments in general terms and to help one another fix specific errors—examples include compiler errors or output formatting. In this case, students are required to note that they received assistance from a classmate by listing that person's name and the nature of their assistance as part of their assignment header.

Any assignment or portion of an assignment that violates this policy will receive a grade of zero for all parties concerned. Depending on the severity of the infraction, or in cases of repeat violations, additional penalties may be given at the instructor's discretion, up to and including a failing grade in the course.

Note that all instances of academic dishonesty will be reported to the Provost's Office, as required by the University's Academic Integrity Policy. Further information on this policy can be found at:

[http://www.uml.edu/catalog/undergraduate/policies/academic\\_dishonesty.htm](http://www.uml.edu/catalog/undergraduate/policies/academic_dishonesty.htm)

### Course Schedule

This schedule contains a tentative schedule of topics we will cover throughout the term; the course website will contain the most up-to-date version. The web page will also describe which section(s) of the textbook are associated with each lecture.

Please note that several days are denoted as "PE#"—in these classes, we will do an in-class programming exercise. While students will be able to participate even if they do not have a computer, I suggest anyone with a laptop bring it to class on these days.

Please note that the first two exam dates are fixed—the first exam will be held on **Wednesday, October 3 in class**, and the second exam will be held on **Wednesday, November 7 in class**. The third exam will be held **during finals (date/time TBD)**.

Week	Date (M)	Lecture Topics	Programs
1	9/3	<i>No Monday lecture—Labor Day</i> Lec. 1: Course introduction/overview; C programming cycle Lec. 2: Basic C program structure; data in C	Program 1 (due 9/10)
2	9/10	Lec. 3: Data in C: Number systems, data types, constants, variables Lec. 4: Input/output: printf() and scanf() Lec. 5: PE1 (Flowcharts and debugging)	Program 2 (due 9/17)
3	9/17	Lec. 6: Operators Lec. 7: Conditional statements: if Lec. 8: Conditional statements: switch	Program 3 (due 9/24)
4	9/24	Lec. 9: Loops: while, do-while Lec. 10: Loops: for Lec. 11: PE2 (Conditionals, loop)	Program 4 (due 10/9)
5	10/1	Lec. 12: Exam 1 Preview <b>Wednesday, 10/3: Exam 1</b> Lec. 13: Intro to functions; Exam 1 Review	
6	10/8	<i>No Monday lecture—Columbus Day</i> Lec. 14: Pointers; pointer arguments Lec. 15: Function/pointer examples	Program 5 (due 10/15)
7	10/15	Lec. 16: PE3 (Functions) Lec. 17: One dimensional arrays Lec. 18: Two dimensional arrays	Program 6 (due 10/22)
8	10/22	Lec. 19: Arrays, pointers, and functions Lec. 20: Character arrays and strings Lec. 21: PE4 (Arrays and strings)	Program 7 (due 10/29)
9	10/29	Lec. 22-24: Topics TBD	Program 8 (due 11/13)
10	11/5	Lec. 25: Exam 2 Preview <b>Wednesday, 11/7: Exam 2</b> Lec. 26: File/unformatted I/O, Exam 2 Review	

**Course Schedule (cont.)**

<b>Week</b>	<b>Date (M)</b>	<b>Lecture Topics</b>	<b>Programs</b>
11	11/12	<i>No Monday lecture—Veterans’ Day</i> Lec. 27: Structures <i>Wednesday, 11/14—Last day to withdraw</i> Lec. 28: Structures (cont.)	Program 9 (due 11/19)
12	11/19	Lec. 29: PE5 (Structures) Lec. 30: Topics TBD <i>No Friday lecture—Thanksgiving Break</i>	Program 10 (due 12/3)
13	11/26	Lec. 31: Dynamic memory allocation Lec. 32, 33: Topics TBD	
14	12/3	Lec. 34-36: Topics TBD	Program 11 (due 12/10)
15	12/10	Lec. 37: Exam 3 Preview <i>Classes end Monday, 12/10</i>	
	TBD	<b>Exam 3 (common final for both sections; will be scheduled by early December)</b>	