

# 16.216: ECE Application Programming

Fall 2015

## Syllabus

### Course Meetings

Section 201: MWF 12-12:50, Ball 314

Section 202: MWF 1-1:50, Ball 314

Section 203: MWF 1-1:50, Ball 208

### Course Website

Main page: <http://mjgeiger.github.io/16216/f15/>

Schedule: <http://mjgeiger.github.io/16216/f15/schedule.htm>

### 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/fall2015/16216>

### Instructors

Dr. Michael Geiger (*Sections 201 & 202*)

E-mail: [Michael\\_Geiger@uml.edu](mailto:Michael_Geiger@uml.edu)

Office: Perry Hall 118A

Phone: 978-934-3618 (x43618 on campus)

Office hours: Monday 9-10:30, Wednesday 9-10:30, Thursday 1:30-3

During the above hours, student questions are my top priority. I will also be in my office MW 10:30-11:45 and F 9-11:45, and I am available by appointment at other times.

Feel free to stop by my office, e-mail me questions, or schedule a one-on-one appointment. Office hours are subject to change.

Nasibeh Nasiri (*Section 203*)

E-mail: [Nasibeh\\_Nasiri@student.uml.edu](mailto:Nasibeh_Nasiri@student.uml.edu)

Office hours: Monday 3-4, Wednesday 3-4, Friday 3-4 in ECE small conference room (Ball 301)

### 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. 3 credits.

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. You must resubmit your code by the given deadline for that assignment; late penalties will apply to late resubmissions. Note that the resubmission policy does not allow you to avoid penalties when the original submission is late (e.g., an assignment losing 4 points for a late initial submission has a maximum possible score of 96 for the resubmission). 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. However, any sharing of code—even when used strictly to help a classmate solve a specific error—is a violation of the academic honesty policy.

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.

Further information on the university Academic Integrity policy can be found at:

<http://www.uml.edu/Catalog/Undergraduate/Policies/Academic-Policies/Academic-Integrity1.aspx>

## 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 exam dates are fixed—the first exam will be held on **Wednesday, September 30 in class**, the second exam will be held on **Wednesday, November 4 in class**, and the third exam will be held **during finals, at a date/time to be determined**. Please note that the final exam **will likely be a common final for all sections**.

Week	Date (M)	Lecture Topics	Programs
1	8/31	<i>No Monday lecture—classes start 9/1</i> 1. Course introduction/overview; basic C program structure 2. Data in C: data types, constants	Program 1 (due 9/9)
2	9/7	<i>No Monday lecture—Labor Day</i> 3. Variables 4. Operators; output with printf()	Program 2 (due 9/17)
3	9/14	5. Input with scanf() 6. PE1 (Flowcharts, debugging) 7. If statements	Program 3 (due 9/24)
4	9/21	8. Switch statements 9. While and do-while loops 10. PE2 (Conditionals, while loops)	Program 4 (due 10/7)
5	9/28	11. Exam 1 Preview <b>Wednesday, 10/1: EXAM 1</b> 12. For loops -or- Exam 1 Review	
6	10/5	13. Exam 1 Review -or- For loops 14. Functions 15. Function examples	Program 5 (due 10/15)
7	10/12	<i>No Monday lecture--Columbus Day</i> 16. Pointers; pointer arguments ( <i>Tuesday, 10/13</i> ) 17. PE3 (Functions) 18. One dimensional arrays	Program 6 (due 10/26)
8	10/19	19. 2-D arrays; arrays and functions 20. 2-D arrays and functions 21. Character arrays and strings	
9	10/26	22. More string examples 23. File I/O 24. Character and line I/O	Program 7 (due 11/9)

**Course Schedule (continued)**

Week	Date (M)	Lecture Topics	Programs
10	11/2	25. Exam 2 Preview <b>Wednesday, 11/5: EXAM 2</b> 26. PE4 (File I/O) -or- Exam 2 Review	
11	11/9	27. Exam 2 Review -or- PE4 (File I/O) <i>No Wednesday lecture—Veterans Day</i> 28. Bitwise operators <i>Friday, 11/13: Last day to withdraw</i>	Program 8 (due 11/18)
12	11/16	29. Common bitwise operations 30. Structures 31. Structures (continued)	Program 9 (due 11/30)
13	11/23	32. Dynamic memory allocation <i>No Wednesday, Friday lecture--Thanksgiving Break</i>	Program 10 (due 12/9)
14	11/30	33. Dynamic memory allocation (continued) 34. Dynamically allocated data structures 35. Dynamically allocated data structures (cont)	
15	12/7	36. Dynamically allocated data structures (cont) 37. Exam 3 Preview <i>Classes end Wednesday, 12/9</i>	
	TBD	<b>EXAM 3 (DATE/TIME TBD)</b>	