
SYLLABUS CMPE 311

C PROGRAMMING AND EMBEDDED SYSTEMS - FALL 2014

COURSE DESCRIPTION

In this course, students learn about hardware and software aspects of embedded systems. Students learn C programming language through use in an embedded platform. The course builds on CMPE 310, introducing advanced topics including communication interfaces, advanced IO devices and other peripherals, multitasking, firmware, real-time operating systems/embedded operating systems and device drivers. The course will provide a hands-on experience in designing and programming an embedded system using a microcontroller-based development platform

COURSE DETAILS

MEETING TIMES

Lecture: Monday, Wednesday 4:00-5:15 Sherman 151
Discussion: Monday or Wednesday 5:30-6:45 ITE 375

INSTRUCTOR

Alexander Nelson
Graduate Student, CSEE
ITE 201F
Email: anel1@umbc.edu
Office Hours: 3:00-4:00 Monday, Wednesday

TEACHING ASSISTANTS

Deepak Krishnankutty
Graduate Student, CSEE
Email: deepakk1@umbc.edu
Office Hours: 12:00 – 1:00 Monday, Wednesday
ITE 375 or ITE 240 (TBD)

Rebecca Baldwin
Graduate Student, CSEE
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TEXTBOOK

Embedded Systems: A Contemporary Design Tool by James K Peckol 7th edition
ISBN: 9780471721802

COURSE MATERIALS

All materials will be posted to my website at <http://www.csce.umbc.edu/~alnel1/cmpe311>

PREREQUISITES

REQUIRED: CMPE 310 – Systems Design and Programming

MAJOR LEARNING OBJECTIVES

At the conclusion of this course, students will:

- Have developed programming skills in the C language
- Understand the hardware and software requirements for a microcontroller-based embedded system
- Be familiar with , and be able to use built-in microcontroller peripherals including coding and building external hardware
- Be able to develop code for multi-tasking applications, and be familiar with process synchronization, resource sharing, and task scheduling
- Be able to install and use a real-time operating system on embedded hardware
- Be able to design and build a real-time system performing data-capture, communications, and user interface

COURSEWORK, GRADING, AND ASSESSMENT

GRADE DISTRIBUTION

Grading will be based on the following scheme, though I reserve the right to make minor changes to the distribution as I see fair and appropriate during the semester. All changes will be announced in class and reflected in a syllabus change

- In Class Quizzes, Assignments, and Exams: 30%
- Projects: 50%
- Class Participation: 5%
- Discussion Section Participation: 15%

Final grades will be assigned according to the following scores:

- A: 90% or greater
- B: 80%-89.9%
- C: 70%-79.9%
- D: 60%-69.9%

F: 59.9% and below

I reserve the right to change this scale as I see fair, but I guarantee that you will earn at least the grade given by these scores.

QUIZZES, ASSIGNMENTS, AND EXAMS

There will be one exam on the date assigned for the final worth 10% of the final grade. It will be cumulative for material learned over the entire semester. A review day will be given the class period before finals day.

A cheat sheet will be allowed so that code constructs do not have to be memorized.

There will be two in-class assignments worth 5% of the final grade each. They will be in the form of short C programming assignments to gauge understanding of the C programming language. You will have full access to your laptops for these assignments, but there will be no collaboration.

There will be about 10 short quizzes given throughout the semester. I will throw out the lowest 2 grades from the quizzes (non-attendance will be a zero for these). This will count as 10% of your final grade.

PROJECTS

Five projects will be assigned throughout the semester. These projects are long, and require a significant effort on the part of the student. I suggest starting them when they are assigned and getting help from the TAs and instructor whenever necessary. This is not a software class, hacking a solution together at the end of the homework period will likely run you into hardware issues which you cannot resolve in time.

The distribution of the grades across the projects will be based on their length, and are not necessarily 10% for each project.

DISCUSSION SECTION

Discussion section grades are based off of attendance and performance in the discussion sections, with grades assigned by the TA of that section. Each meeting will be assigned with a pass/fail grade according to meeting a certain criteria for that meeting. The final grade for this section will be the number of passes earned divided by the number of meetings.

If you must miss for a good reason, contact the TA and ask how you may make it up. Unexcused absences will receive a fail for that meeting.

QUESTIONS AND FORUM

We will be using Piazza for this class. You can sign up for the course forum at piazza.com/umbc/fall2014/cmpe311. Look for and post questions here first so that the TAs or instructors can answer them without redundancy.

DO NOT post code on this site. If you post code for a project/homework on this site, I will treat it as an academic integrity issue. DO NOT post your code on other sites where it may be grabbed by the class(stackoverflow, googlegroups, etc...). Try to come to instructor or TAs with direct code questions, or ask single line/pseudocode questions if the need arises.

LATE POLICY

Late projects will be assessed the following penalties based on their lateness

1 day late – 5% off

2 days late – 15% off

3 days late – 30% off

4 or more days late – A zero will be assigned

This policy is rigid and will not change excepting extreme circumstances

COLLABORATION POLICY

Unless otherwise given in the project/assignment statement, all homework, quizzes, assignments, and exams are to be completed alone. This includes the sharing of code. Any code taken from websites must be CITED according to policy on the website. Discussion of projects among the class is expected and you may minimally discuss approaches to projects.

ACADEMIC INTEGRITY AND MISCONDUCT

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult UMBC policies, or http://www.umbc.edu/undergrad_ed/ai/students.html