

EE 335 Advanced Microcontroller Engineering Course Overview

Oregon Institute of Technology, Wilsonville, Winter 2013

INSTRUCTOR: Tom Almy

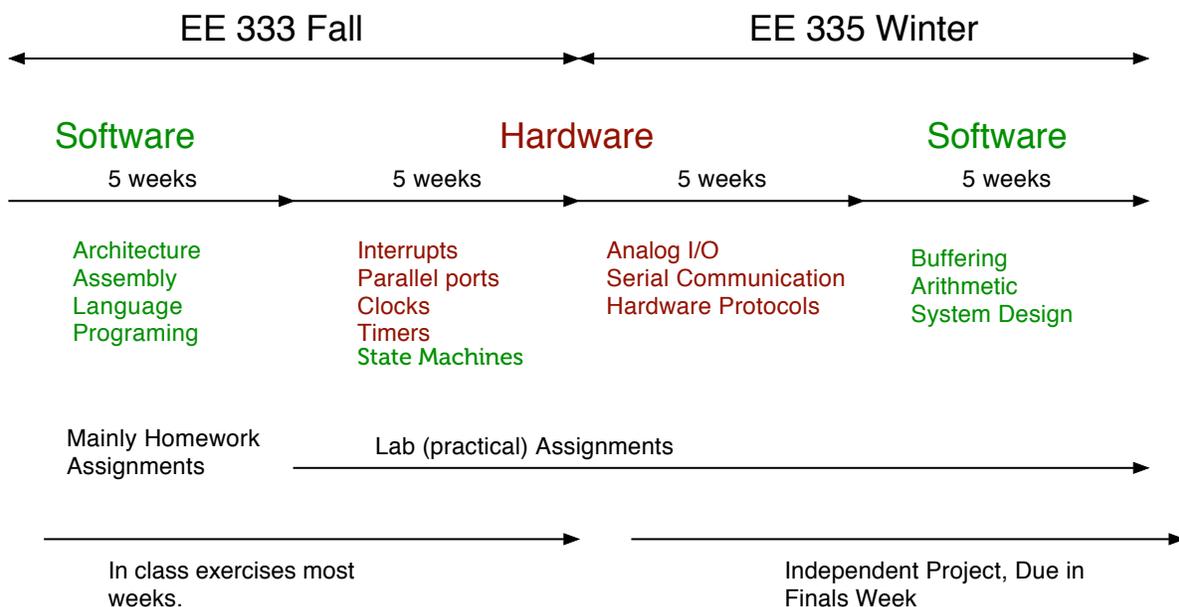
PHONE: XXXXX

E-MAIL:XXXX assignments to XXXXX

OBJECTIVES:

Upon completion of this course the student will be able to program and use the various features of the 68HCS12 to perform specific tasks: will be able to utilize serial interfaces, analog signal interfaces, and EEPROM memory. Will be able to explain and utilize fixed point (non-integer) arithmetic and floating point arithmetic. Will be able to write and utilize exception (interrupt) routines. Will be able to design, program, and test a working microprocessor system having both a hardware and user interface. Will demonstrate communication skills by writing a project report covering the lab project and skills and knowledge gained from the lectures and homework.

The course catalog states "Second course Microcontroller Engineering, further use programmable microcontroller peripherals, A/D conversion, PWM, synchronous serial. Prerequisite: EE 333 with grade "C" or better." The course ties in with EE333 to provide fairly thorough coverage of current microcontroller usage.



CLASS MEETINGS: We will meet on Tuesdays from January 8 through March 19, starting at 5:30 PM, sharp, in room 252. There will generally be 2 to 2.5 hours of lecture, sometimes with class exercises, followed by lab time, during which the instructor will be available for assistance and to answer questions. Classes end at 9:50 PM. The project and report are due March 19 at 5:30 PM, with project presentations following that evening.

REQUIRED TEXTBOOK AND HARDWARE: *Designing with Microcontrollers – The 68HCS12*, by Tom Almy, which is on the software package supplied to students for free. Printed copies will be available for \$10. Dragon12-Plus2-DB board and documentation available at www.evbplus.com. The board is \$169 (plus shipping). You can also use earlier Dragon12P-USB-DB but should not use earlier boards because they are missing features used in the lab assignments.

COMPUTER USAGE: The text, 68HCS12 documentation, and all assignments are accessible in the provided software package. There is also a 68HCS12 simulator program, assembler, and C compiler for use in class or at home. Computer access is necessary outside of class. I strongly recommend doing all work on your own computer. Some weeks there will be (ungraded) in-class exercises which are best done using a computer with the 68HCS12 simulator or the Dragon12 board.

READING ASSIGNMENTS: There are weekly reading assignments from the text and 68HCS12 documentation. Because of time constraints, not all the material is planned to be covered in class, but questions will be answered about all the material so please read in advance of class and have questions ready.

HOMEWORK AND LAB ASSIGNMENTS: All homework is in the form of lab assignments. For convenience, all assignments are given the same weight even though they will vary in difficulty. In general, there is an assignment due in the week following that which the material is covered in class. It is advantageous to start the assignment in the lab time after lecture in the class period.

All assignments are discussed in class on the day they are due, and must be turned in at the start of the class sessions. Manage your time carefully! All assignments are to be submitted via E-MAIL to XXXXXX.

Assignments should be submitted as a single file, PDF preferred, or Microsoft word DOC or DOCX otherwise. The name of the file should be your name and the assignment number.

While students can help each other on the assignments, each student is expected to develop and submit their own individual solution. You may also ask the instructor for advise if you are having difficulties.

Because the unexpected may happen, every students gets a virtual Late Card:

Late Card

Good for one late lab assignment being accepted up to one week late.

Limitations: Only one card per student per term. Cards not transferable. Valid only for EE335, Fall 2013, Tom Almy Instructor. No cash value. Void where prohibited by law

Use it wisely.

QUIZZES AND EXAMS: There are no quizzes or exams. There will be some in-class exercises which will not be graded, but participation is encouraged since it will help in completing the lab assignments.

THE COURSE PROJECT: There is a course project assignment be to develop a complete 68HCS12 application of the students choosing, using the Dragon12 and external components. Grading will be based on a project demonstration, and the project report. The requirements are listed in the assignment

You need to decide on a project and submit a proposal the second week of the term, January 15. The proposal isn't formal -- just an email describing your plans will suffice. The instructor must approve the project. You should gather all necessary components early in the term to avoid problems later with unexpected unavailability.

THE PROJECT REPORT: A project report is to be written following the guidelines listed in the assignment. The report is to cover all the development, including design decisions, for the lab project as well as other topics covered in the course but not directly used in the project.

ABSENCES: Students are expected to attend all class sessions except for illness, personal emergencies, or job requirements. That does not mean students are excused from missed assignments. All assignments are due according to schedule. A grade of Incomplete is generally not available for this course.

CELL PHONES: Please turn off cell phones (or have them on "vibrate") during the lectures to avoid disrupting the class.

STUDENT FEEDBACK: For my own benefit in improving my teaching style, there will be a 30 second student feedback form to fill out at the end of each class. In return you will get 0.5% of the final lecture grade no matter what you say. That works out to 4.5% of the final EE 335 grade available for 10 minutes of work. What a deal! As an additional bonus, you get a chance to ask an anonymous question. Answers to questions are posted on the class forum.

ON-LINE CLASS FORUM: A class forum is used for communication to the entire class or for students posing questions or comments about the course for the class to read. The site is XXXXXXX and you will have to create an account in order to use the forum. It is recommended that you check the forum on a daily basis to check for new postings.

C LANGUAGE OPTION: Students with a working knowledge of C may use the C compiler provided on the CD for all assignments except for the homework assignment on floating point. Those students will find that using C will save time. However students with little or no C knowledge should use the assembler. Instructions and software are in the GNU folder, but also read *Creating a C Program*.

GRADING: Numeric grades are converted to letter grades based on the chart, below. Each of the 9 lab assignments is worth 7% of the grade (63% total), the lecture evaluations are worth 4.5% total, the project proposal (submitted on time) is 2.5%, successful project demonstration is 10%, and the project report is 20%.

Numeric Grade	Letter Grade
90 and up	A
at least 80, but less than 90	B
at least 70, but less than 80	C
at least 60, but less than 70	D
less than 60	F