

ESE 380 Embedded Microprocessor Systems Design I

Fall 2007 - KLS/FST August 28, 2007 2:54 pm (V2)

Course Syllabus

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Office Hours: Light Engineering, 2nd floor, room 251
9:30 AM to 11:30 AM, Tuesdays and Thursdays

Objectives

An enormous variety of electronic systems, ranging from trivial to extremely complex, are designed around an embedded microprocessor or microcontroller. This course presents the fundamental hardware and software concepts used in the design of such systems. The device to be used in this course is Atmel's ATmega16, a modern 8-bit RISC microcontroller.

The four primary Atmel reference documents used in this course are:

1. ATmega16 Datasheet *
2. Atmel 8-bit AVR Instruction Set *
3. AVR Assembler User Guide (Section 4 of Development Tools User Guide)
4. Welcome to AVR Studio

These documents can be found on Blackboard under Course Documents > Atmel Documents. Other documents, will also be available for download from Blackboard. You should also have access to a good introductory digital logic design textbook. Your textbook from ESE 218 should suffice.

* For the purposes of this course it will be quite helpful to have the first two items listed above, the ATmega16 Datasheet (~350 pgs) and the AVR Instruction Set individually bound for use in the course. **However, due to cost considerations, you will only be required to print and bind a full copy of the ATmega16 full datasheet. Use the version of this datasheet that is posted on BB. You must have this document printed and bound, and with you for your first ESE-380 lab session.**

Blackboard

The URL for Blackboard is <http://blackboard.stonybrook.edu>. If you are unfamiliar with Blackboard try "<http://www.ic.sunysb.edu/Help/bbstudent.html>". **It is imperative that you check Blackboard very regularly (e.g., daily) for possible announcements and course related postings. This is a very important resource, which provides access to many useful documents.**

Lecture

The purpose of the course lectures is to clarify and extend concepts from the lecture slides, reading assignments, and to elaborate on subjects and concepts required for the laboratory design work. Lectures are held in room 102 of the Light Engineering Building from 12:50 to 2:10 p.m. on Tuesdays and Thursdays. Lectures and or quizzes will start on time. Please be prompt!

Lectures are presented based upon the assumption that you have completed all assigned reading prior to the lecture. Reading assignments are taken primarily from reference material that is available on Blackboard or at Atmel's web site (<http://www.atmel.com>). Handout copies of the PowerPoint presentations used in the lectures will generally be available on Blackboard at least one week before being covered in lecture. **Accordingly, each presentation should be carefully reviewed before lecture.** Material from reading assignments and PP presentations may appear on weekly quizzes. **This may be the case even before these items/concepts are formally discussed in lecture.**

AVR Studio

The software development environment used in this course is AVR Studio. Programs for this course will be written in assembly language. Studio provides an assembler and simulator for developing and debugging programs for Atmel's AVR family of microcontrollers including the ATmega16. This software will be available for use in the Embedded Systems Design Laboratory and in the CAD Laboratory. You can download a copy for use with your personal computer from the Atmel web site. A link is provided on Blackboard under Course Documents > Link to Studio 4 download page.

Laboratory

Laboratory sections meet once a week in the Embedded Systems Design Laboratory (room 230 of the Light Engineering building). Laboratory assignments are performed by groups of two students. **Laboratory activities start the week of September 17th.** Laboratory sessions during this first full week of classes will consist of an orientation, and an introduction to wiring techniques. In addition, during this initial laboratory session you must select a partner who you will work with for the entire semester. Groups of more than two students are not permitted. Attendance during the first laboratory session is mandatory, and the circuit constructed will be needed for the following laboratory experiment(s). You are not required to prepare any pre-laboratory work for your first laboratory session.

You must be registered for one of the following laboratory sections:

Lab. Sec. 1	Tuesday	2:30 to 5:30 pm
Lab. Sec. 2	Tuesday	6:00 to 9:00 pm
Lab. Sec. 3	Wednesday	3:45 to 6:45 pm
Lab. Sec. 4	Thursday	2:30 to 5:30 pm

Laboratory section changes will be permitted during the first two weeks of class if space is available in the section to which you wish to change. To change sections, you must see Ms. Huggins in room 267 of the Light Engineering Building.

Laboratory assignments are generally provided 5 to 7 days before your laboratory session - typically by the end of the day on the Wednesday of the Week before the experiment is to be performed. This is the case as a portion of your pre-laboratory design work must be submitted at the very beginning of your assigned lab-

oratory session. **Your completed laboratory report must be submitted, to your TA, by the end of your laboratory session. No work will be accepted late or after that time.**

Make-up Labs and Switching Sections

Due to staff and equipment limitations, it will not be possible for you to make up missed laboratory work. One of the first eight (8) laboratory grades will be dropped, even if that grade is a zero.

Due to course enrollment levels, it is generally not possible accommodate requests to switch sections for a given week. If a switch is to be attempted, such requests must be of an emergency or very serious nature (e.g., your birthday is NOT serious), and must be made at least one week in advance.

Grading

Grading for ESE380 will be based on four components, as listed and defined below:

Quizzes	25%	(Unannounced, approx. weekly, 15-30 minutes max.)
Midterm Exam	20%	(Oct. 23rd - Don't Miss This One!)
Final Exam	25%	(Thursday, December 20th, 11- 1:30 p.m, MANDATORY)
Labs	30%	(Approx. 10 or 11 labs)

Any questions you have regarding grading of exam or laboratory work must be resolved within one week from the day the work is made available for return. **After one week, no grade changes will be made for any reason.**

One of the earlier lab grades may be dropped. A decision will be made later in the semester. Please note that no quizzes or Exams will be dropped. You must take all of these. If one is missed you will receive a grade of zero (0).

Academic Integrity - Academic Dishonesty:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

Provost's Statement

If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, you are urged to contact the staff in the Disabled Student Services office (DSS), Room 133 Humanities, 632-6748/TDD. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate.