EE 6314-001 Advanced Embedded Microcontrollers
Spring 2014
2:30-3:50pm MW, 106 NH
7:00-9:50pm MTWThF, 148 or 148A NH Lab

Instructor:
Jason Losh, Ph.D.
jlosh@uta.edu
Office Hours are after 6:50pm MW outside the room for EE5313 (currently 100GS)
E-mail is the quickest method of contacting me on non-class days.
No phone or office has been assigned by the University.

Textbook:
No textbook will be required for this course. Extensive references, datasheets, application notes, and class notes will be provided on the course web site at http://omega.uta.edu/~jlosh/.

Listserv:
Please sign up for the EE6314-L listserv to receive the latest updates (go to http://listserv.uta.edu for details)

Catalog Course Description:
6314. ADVANCED EMBEDDED MICROCONTROLLER SYSTEMS (3-0). Study of advanced microcontroller system designs with an emphasis on multi-tasking, real-time control of devices. Topics include: design of real-time control systems, programmable logic controller (PLC) hardware, USB peripherals, and network appliances. Prerequisite: EE 5314 or consent of instructor.

Comments on the Course:
As in EE5314, all topics will be accompanied with working hardware and software. A common prerequisite and smaller class size allow this class to be conducted in a collaborative team style, where system design, specification, and implementation are accomplished through a combination of individual and group tasks, with different members of the team having responsibility for varying parts of the design. Some flexibility in grading may be provided in students wishing to solve more difficult assignments.

Requirements:
Completion of EE5314 Embedded Microcontrollers is required. Alternatively, a leveling exam may be taken on the first day of class to determine eligibility for taking the course.

A good understanding of ANSI C is also required. On the PIC controller, code will be written using the Microchip MPLAB® C compiler and several Win32 applications will be written using Microsoft Visual C++® version 6.0 or later.

Measurable Student Learning Outcomes:
- Selection of a class project topic
- Review of 33FJ architecture, assembly code, and C programming
- Development of a bootloader
- Determination of the need for a real-time operating system (RTOS)
- Benefits and drawbacks of RTOS and alternatives to RTOS implementations
- Study of RTOS problems (i.e. priority inversion on Mars Pathfinder, blocking threads)
- Converting device drivers from blocking to RTOS-friendly handlers
- Construction of a real-time operating system (preemptive and cooperative)
- Development of ethernet stack with ARP/RARP, ICMP (ping, ack, nack), IP, and UDP
- Class Project specific topics

Important Dates:
First Class (Monday, 1/13), No Class (Monday, 1/20), Census Date (Wednesday, 1/29), Project 1 Defense (Wednesday, 3/5 @ 2:30pm), Spring Break Week (3/10-14), Last Drop Date (Friday, 3/28), Test (Wednesday, 4/16), and Project 2 Defense (Wednesday, 4/30 @ 2:30pm)

Performance Assessment:
- Grade scale: A (90-100), B (80-89), C (70-79), D (60-69), and F (0-59)
- Standard grade calculation: (Test + Project 1 + Project2) / 3
- The instructor reserves the right to make reasonable changes in performance evaluation as needed.

Graduate Teaching Assistant:
This information will be announced in class.

Cost:
No textbook will be required.

An in-circuit debugger will be provided to check out for the semester to teams of 3 and off-campus students. If adequate numbers of programmers are available, teams of 1 and 2 members will also be provided in-circuit debuggers for check out. Programmers are also available for use in 148NH. For students unable to utilize the provided programmers, a programmer will need to be purchased.

Parts required for the project will generally be less than $60 per team and many times are provided by the Department, dependent on the class project chosen for Project 2.

Projects:
- Project 1 (rtos) will consist of project teams of up to 3 members and will require that simple hardware be constructed.
- Project 2 (class project) will consist of project teams of varying sizes and will require some hardware and use of the common class hardware for some portions of the development process.
- Project deadlines may change slightly depending on the type of class project chosen.

Attendance Policy:
Attendance is not required, but a grade of zero will be provided for any quiz, test, or project deadline that is missed. The student is responsible for obtaining notes on any material missed.

Academic Integrity:
It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. According to the UT System Regents' Rule 50101, §2.2, "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts."

EE Department Policy requires that you sign and return a letter acknowledging the College of Engineering Ethics policy.

Drop Policy:
Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. Students will not be automatically dropped for non-attendance**.**

Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. Contact the Financial Aid Office for more information.

Americans with Disabilities Act:
The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Student Support Services:
The University of Texas at Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. These resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals to resources for any reason, students may contact the Maverick Resource Hotline at 817-272-6107 or visit www.uta.edu/resources for more information.

Electronic Communication Policy:
The University of Texas at Arlington has adopted the University “MavMail” address as the sole official means of communication with students. MavMail is used to remind students of important deadlines, advertise events and activities, and permit the University to conduct official transactions exclusively by electronic means. For example, important information concerning registration, financial aid, payment of bills, and graduation are now sent to students through the MavMail system. All students are assigned a MavMail account. Students are responsible for checking their MavMail regularly. Information about activating and using MavMail is available at http://www.uta.edu/oit/email/. There is no additional charge to students for using this account, and it remains active even after they graduate from UT Arlington.

To obtain your NetID or for logon assistance, visit https://webapps.uta.edu/oit/selfservice/. If you are unable to resolve your issue from the Self-Service website, contact the Helpdesk at helpdesk@uta.edu.

Lab Safety Training:
EE department policy requires that students utilizing 148NH attend a safety orientation session.