CSE5343
Real-time Data Acquisition and Control (Embedded II)
Spring 2013

Instructor(s): Dr. Roger S. Walker

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Office Hours: TTH 2:00 – 3:30PM other times by appointment

Section Information: CSE 5343-001, CSE 5343 – 002, CSE 5343-003, CSE 4342-001 CSE 4342 - 003

Time and Place of Class Meetings: All lectures, Rm. 103 ERB

Description of Course Content: This course is the second course in the Embedded Computer System Series. With the increasing performance of the microprocessor families in conjunction with advances in power reductions, speed, cost, and high levels of integration, the high performance processors are moving into the embedded area.

The course discusses real-time data acquisition and embedded systems and how they are using the new multi-core processors. The course also discusses various sensors used in real-time data acquisition and embedded systems. The course discusses FPGAs and their uses in embedded systems

Prerequisites: senior EE or CSE student, or graduate standing.

COURSE TOPICS:
• Review of Embedded Systems.
• Evolution of High Performance Micro Processors
• Multi-core Architecture and Hyper-threading
• Threading and Parallel Programming
• Threading API’s
• Threading on Intel Multi-Core Processors
• Real-time data acquisition and embedded systems
• Data Translation and other Data Acquisition Modules
• FPGAs (field-programmable gate array) – Basic Concepts, Soft Processors

Student Learning Outcomes: Students should be able to understand basic concepts of real-time multicore systems and their uses in embedded systems,

Requirements: See CSE Catalog

Required Textbooks and Other Course Materials: ‘Multi-core Programming, Increasing Performance through Software Multi-threading’, Akhter and Roberts, Intel Press, 2006. : Lecture Notes and web links will be provided for most lectures. Lab Manual materials, Reference materials, Software Development for Embedded Multi-Core Systems, and any other needed material will be placed in the lab, on the web or in Library on reserve.
• **Descriptions of major assignments and examinations:** 2 Exams (50%)
• Homework/Labs (10%)
• Lab work (40%)
• A grade of zero will be recorded on any unexcused absence from an exam.

**Attendance:** Students are responsible for all material presented in class

**Grading:**
Assignments must be turned in by due date or will be considered late.
• 10 points will be deducted from all late home work.
• Home work two or more class days past the due date will not be accepted and a grade of zero will be recorded.

**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. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/ses/faq).

**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.

**Academic Integrity:** At UT Arlington, academic dishonesty is completely unacceptable and will not be tolerated in any form, including (but 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” (UT System Regents’ Rule 50101, §2.2). Suspected violations of academic integrity standards will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student’s suspension or expulsion from the University.

**Student Support Services:** UT 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. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may contact the Maverick Resource Hotline by calling 817-272-6107, sending a message to resources@uta.edu, or visiting www.uta.edu/resources.

**Lab Safety Training:** Students registered for this course must complete all required lab safety training prior to entering the lab and undertaking any activities. Once completed, Lab Safety Training is valid for the remainder of the same academic year (i.e., through the following August) and must be completed anew in subsequent years. There are no exceptions to this University policy. Failure to complete the required training will preclude participation in any lab activities, including those for which a grade is assigned.

**Electronic Communication:** UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking
the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory will be asked to complete an online Student Feedback Survey (SFS) about the course and how it was taught. Instructions on how to access the SFS system will be sent directly to students through MavMail approximately 10 days before the end of the term. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback data is required by state law; student participation in the SFS program is voluntary.

**Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.