

CSE 6324: Advanced Topics in Software Engineering
Fall 2013

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Office Hours: 10:00 – 11:00am & 2:00 – 3:00pm, Tue and Thu

Section Information: CSE 6324 Section 001

Time and Place of Class Meetings: 12:30pm – 1:50pm, Tue and Thu, ERB 130

Description of Course Content:

Recent years have seen a proliferation of concurrent software systems. Allowing multiple threads/processes to execute simultaneously increases resource utilization and leads to improved computing efficiency. However, concurrent software systems are inherently nondeterministic. As a result, it is notoriously difficult to build these systems and ensure their correctness.

The focus of this course is on the construction of concurrent software systems with high assurance. The topics covered by this course can be divided into two parts. The first part highlights basic concepts, principles, and techniques that are underlying the design, development, debugging, and testing of concurrent software systems. The second part provides an introduction to formal methods in modeling, specification and verification of concurrent software systems.

Student Learning Outcomes:

- A solid understanding about the basic concepts, principles, and techniques of concurrent programming.
- A solid understanding about a set of classic synchronization problems as well as their solutions.
- Ability to analyze, design, code, and test concurrent code for solving common synchronization problems.
- A broad view about the latest development in design, analysis and verification of concurrent programs.

Requirements:

Basic understanding about software engineering and operating systems. Moderate proficiency in Java programming.

Required Textbooks and Other Course Materials:

Textbook:

Richard H. Carver and Kuo-Chung Tai, Modern Multithreading, John Wiley & Sons, 2005, ISBN: 0-471-72504-8

Reference:

Maurice Herlihy, *The Art of Multiprocessor Programming*, Morgan Kaufmann, 2008, ISBN: 0-123-70591-6

Robin Milner, *Communication and Concurrency*, Prentice Hall, 1989, ISBN: 0-13-115007-3

Descriptions of major assignments and examinations:

There will be several homework assignments, a midterm exam, and a team project.

Attendance: Strongly encouraged. The instructor reserves the right to change this policy as needed.

Grading:

Tentatively, the final grade will be determined according to the following percentages:

Homework Assignments - 20%

Midterm Exam - 50%

Project - 30%

Make-up Exams: No make-up exams will be given.

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://www.uta.edu/ses/fao>).

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.

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.