

**IE 5307 – 001, 002
Queueing Theory
Spring 2015
TTh 3:30 - 4:50 p.m.
Woolf Hall 404**

Instructor: Bill Corley

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Office Hours: MTTh 2:00 - 3:00 p.m

GTAs: Alireza Noroziroshan (alireza.noroziroshan@mavs.uta.edu)

GTA Office Hours: 12:00 - 3:00 p.m. in ELB 308 (COSMOS).

Description of Course Content: The fundamentals of queueing theory including Markovian birth-death models, networks of queues, and general arrival and service distributions.

Student Learning Outcomes: At the end of this course the student should be able to analyze and model real-world queueing systems, as well as read journal articles on queueing theory. These outcomes will be evaluated with two take-home quizzes and a group project involving a practical application of queueing.

Prerequisite: IE 3301 (Engineering Probability) or IE 5317 (Introduction to Statistics) or equivalent.

Required Text: *Fundamentals of Queueing Theory*, fourth edition, Gross & Harris, John Wiley, 2008.

Changes to Syllabus: The instructor reserves the right to make reasonable modifications to this syllabus as needed during the semester when circumstances arise. Students will be notified in advance of such changes both in class and by email. All students are responsible for such changes.

Attendance: It will not be taken after the first two weeks of class, but class attendance is strongly encouraged. You are responsible for any information given in class.

Homework: Homework will not be graded. However, students are strongly encouraged to work suggested problems.

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 6 hours per week of their own time in course-related activities. This time amounts to two hours outside class for every hour in it. The take-home exams and projects will require further time.

Class Courtesy: To enhance learning, the instructor insists on a quiet classroom. Silence cell phones before class and refrain from talking during class. Late students should enter the classroom as discreetly as possible. If students persist in arriving late, the classroom will be locked 10 minutes after class begins as to prevent such behavior. In that case students arriving later will not be allowed to enter. In general, students who are disruptive in class will be asked to leave.

Late Submissions: Late submissions of any type will be graded down 10 points per hour late rounded up to the next whole hour.

Description of Major Assignments and Examinations:

1. There will be two take-home exams on the dates in the schedule below. The problems on each exam will be equally weighted even though some may be easier or harder than others. In-class students must turn in their exams in class at 3:30 p.m. on the due date. Distance students may submit a pdf via email by 3:30 p.m. on the due date. Exams will be returned on the period following the due date.
2. Individual Projects:
 - (a) One student's project will be a survey of queueing software with simple examples. Another student's project will be a basic explanation of computer simulation for queues with a simple example. A third student's project will be a survey of computer simulation software with a simple example. These presentations will be 25 minutes long. Please let me know if anyone wants one of these topics during the first period. Otherwise, they will be assigned.
 - (b) For the remaining students, the goals of the project are to identify a practical queueing situation worthy of a minor study, to model the situation analytically, to learn the basics of writing a project proposal, to complete the study and do necessary computations using queueing software, to learn the basics of writing a project report, and to make a 15-minute PowerPoint presentation to the class. Students must work alone. This project will be graded on the basis of the report's content, the report's organization and proper style, and the presentation's organization and professionalism. The proposal must be submitted via email on February 12. The presentations will begin on April 30.

Exam Grading Complaints: If you disagree with your grade on any test problem when the exam is returned, you must submit after that class a written statement on the back of the returned exam that clearly explains the reason you wish the problem to be regraded. Remember that only what you systematically wrote on the exam paper can be considered in grading a problem – not what you meant or claim to know. Moreover, answers that are submitted without supporting work will receive no credit. If a test is submitted for regrading, the entire test will be regraded. Finally, a student may request that an exam be regraded only on the day the exam is returned.

Schedule:

- Overview – 1 period
- Background material – 4 periods
- Basics of queueing theory – 5 periods
- Take-home exam 1 – take-home exam given out February 20 and due March 3.
- Chapter 1 – 2 periods
- Chapter 2 – 5 periods
- Spring break – March 9 - 13.
- Chapter 3 – 4 periods
- Chapter 4 – 4 periods
- Chapter 5 – 1 period
- Chapter 8 – 1 period
- Take-home exam 2 given out – Take-home final given out on Tuesday, April 21 and due at noon on Tuesday, May 12.
- Student presentations – April 30 - May 7.

Course Grade: Each exam and the project count 1/3 of the grade. The two exam grades are not curved. Typical Grading Format: A = 90 - 100, B = 80 - 89, C = 65 - 79, D = 55 - 64, F = below 55.

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 withdraw officially 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/aao/fao/>).

Distance Education Policy: See the IMSE Departmental distance education policy at <http://www.uta.edu/ie/current-students/distance-learning.php>. Distance students are required to communicate with the faculty before the second class period. For any problems viewing ClassRev (Echo360) recordings, contact classroomsupport@uta.edu.

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>.

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.

Title IX: The University of Texas at Arlington is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

Academic Integrity: UTA expects all students, whether in-class or distance, to abide by its Honor Code posted at <http://www.uta.edu/engineering/current-students/academic-honesty.php>.

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System Regents' Rule 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) 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 visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete a Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

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.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located across the hallway through the double doors on the right. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

Inclement Weather Policy: If the University is closed, this class will not meet. Any scheduled assignments or examinations will be rescheduled to the next class period that the class meets. You can get information by dialing 972-601-2049 or checking the main website at www.uta.edu.