

IE 5301: Advanced Operations Research
Fall 2013

Instructor: Jay Rosenberger

Office Number: Woolf 420-D

Office Telephone Number: 817-272-5787

Email Address: jrosenbe@uta.edu

Social Media: LinkedIn, Twitter (@j_rosenbe), Google+ (jaymrosenberger@gmail.com), Facebook

Office Hours: TTh 11:00 AM - 12:00 PM, W 9:15 AM – 10:15 AM

Section Information: IE 5301-001

Time and Place of Class Meetings: Woolf 404, TTh 9:00 AM -10:50 AM

Description of Course Content: A survey of quantitative topics needed for the graduate student to read journal articles in operations research. This course is designed to develop modeling skills and an ability to apply quantitative optimization to the decision-making process.

Student Learning Outcomes: At the end of this course students should be able to (1) understand the basic concepts of difference equations, decision analysis, nonlinear programming, and stochastic processes, (2) apply those concepts to solving numerical problems, and (3) use Tora and Lingo to solve decision problems.

Required Textbooks and Other Course Materials: *Operations Research* by Taha, ninth (or eighth or seventh) edition, Pearson Education.

Mailbox: IMSE Department P.O. Box 19017

GTA: Na Wang (na.wang@mavs.uta.edu)

GTA Office Hours: Woolf Hall 425-A, MW 2:00 PM-5:00 PM

Descriptions of major assignments and examinations: There are three projects, two midterm exams, and a final exam. For the projects, detailed instructions can be found on Blackboard. Each student must submit a typewritten report, written in his/her own words, for each project. Any form of copying will be severely penalized. Projects may be submitted via email with either scanned or electronic signatures. The projects involve using Tora and Lingo software and the topics are: game theory, nonlinear programming, and queuing theory. Midterm 1 is on linear difference equations and z-transforms (4 periods) and decision analysis and game theory (3 periods). Midterm 2 is on goal programming (1 period) and nonlinear programming (5 periods). The Final Exam is noncomprehensive and covers markov chains (4 periods) and queuing theory (6 periods).

Prerequisites: IE 3301 (Engineering Probability) and IE 3315 (Operations Research I), or IE 5317 (Introduction to Statistics and Operations Research), or equivalent.

Test Policies:

- **Before an exam:** Students must bring a UTA I.D. card and a calculator with them to the exam. Students are not allowed to leave the exam room and return to take the test, so students should use the restroom BEFORE the exam. The instructor will provide a seating chart and notes for the exam. Students should take the provided notes, sit in their assigned seats, and clear the desk area of all materials except: pens, pencils, erasers, calculators, and provided notes.

- **During an exam:** Students are only allowed to use pens, pencils, erasers, calculators, and provided notes. Mobile phones, computers, and other communication devices must be turned off. Students should keep their eyes on their own exams. Students are not allowed to leave the exam room and return to take the test. Exams are to be opened and closed at the times announced in class (or by the proctor). Anyone opening an exam early or closing an exam late will be deducted 5 points for each minute outside the exam period. All suspicious behavior during the exam will be noted by the instructor. In certain circumstances, students will be confronted by the instructor.
- **After an exam:** When all of the exams have been graded, the GTA will email scores to the students. The exams will be reviewed in class. Students who wish to see their graded exams must come to office hours. Students who wish to keep a copy of their exams must come to office hours and remove the exam staple, so the exam can be copied. The instructor highly encourages students who perform poorly on exams to come during office hours.

Homework and Attendance: Homework and attendance are not graded. However, students are strongly encouraged to work the assigned practice problems and participate in class. Failure to do so is likely to lead to (i) difficulty in understanding subsequent lessons and (ii) poor performance on tests.

Lecture Mastery: Students are required to master the materials presented in class. To ensure students are paying attention to the lectures, the instructor will announce a lecture code during each class. For each lecture, each student is asked to submit the following statement:

I certify that I have either attended class or watched the video for the lecture on [date of lecture] and have mastered the material. Without assistance, I could summarize the lecture content and reproduce the example problems. The lecture code is [lecture code].

The lecture certifications should be emailed to the GTA by either 12:00 PM on date of the second subsequent lecture or 12:00 PM on the date of the first lecture after census date, whichever date is later. The percentage of lecture mastery certifications will be scaled to 2% and added to your class score.

Class Courtesy: The instructor insists on a quiet classroom and asks that noise be minimized. This includes silencing cell phones before class and no whispering during class. Texting in class is fine but not during exams. Students who come to class late should try to enter the classroom as discreetly as possible. Due to noise in the hallway, the hallway door, which is may be locked, may be shut 10 minutes after class begins. Students who do not come to class within the first 10 minutes of the start of class may not be able to attend class. In this case, the student should watch the recorded video. *Do not knock on the door if it has already been shut.*

Review Classes: Certain classes will be considered review classes. During these classes, the instructor or the TA will review homework, old exams, or previously taught material based upon requests from the students. No new material will be taught during review classes.

Late Submissions: Due dates and times represent the LAST minute that you can receive full credit for your projects and lecture certifications. Projects will be reduced by 10% (one full letter grade) and an additional 10% for each 24-hour period elapsed from the due date and time. Usually, the instructor will place a box in front of his office to submit projects before the due date. You may submit your projects early by handing it to the instructor in class, placing it in the box outside the instructor's office door, sliding it under the instructor's office door, or emailing it to the instructor. Late lecture certifications will not be graded.

Grading: Grading Format: A = 90, B = 80, C = 65, D = 55, F = below 55. Exams are curved as described below, but projects and other work are not curved. The grade weights are as follows:

- Each midterm exam is 25%
- Final exam is 35%
- Each project is 5%
- Lecture mastery certifications are 2%

Observe that there is 102% available, which suggests that attendance is optional. Moreover, exams sometimes include bonus points, though they are usually on extremely challenging problems. Each exam receives a raw score based upon performance on problems and the point allocations described on the exam. Usually these points total 100 but sometimes there are bonus points. Using the average and standard deviation of the raw scores, each exam receives a preliminary curved score based upon a predetermined bell curve. Usually, the predetermined bell curve has a mean of 85 and a standard deviation of 5. Finally, each exam receives a curved score that is the maximum of the raw score and the preliminary curved score. An exam's curved score is what is used to determine the final class grade. The GTA will email exam scores as soon as the exams have been graded. Students must come to office hours to receive their graded exams.

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels.

Historical Grading: Nearly all students in this class who have submitted all of their work and not copied on an exam or project have received A's or B's. The only students to receive D's in this class were caught copying on exams.

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 9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Make-up Exams: Makeup tests will only be given for documented illnesses or emergencies. If you cannot attend a test for any reason, you should make every effort to contact me beforehand.

Grade Grievances: If you would like a test regraded, you must submit a written statement which clearly explains the reason you would like a regrade. If a test is submitted for regrading, the entire test is regraded, and it is possible your score could go down.

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: All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

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.

Instructors 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.

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 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.

Website: Blackboard (<http://elearn.uta.edu>)

Blackboard Help: Ann Hoang; Email: hoanga@uta.edu

Distance Student Test Policies: Exams must be taken with 24 hours of the regularly scheduled exam. Students who live within 50 miles of campus must come to campus to take all exams. Students should make every effort to take exams on-campus during the regularly scheduled time. If this is not possible, alternate exam times will be scheduled. Usually, the GTA will proctor an alternate exam on the evening of the day of the in-class exam. Students living more than 50 miles from campus may take the exam with an approved proctor. Students will be responsible for identifying a proctor. Proctors must be approved by the faculty at least two weeks before the first exam. The proctor should be associated with the testing facility of a community college, a library, a university, or a professional testing center such as a Sylvan Learning Center. Students are responsible for any fees charged by the testing facility. Students who choose to use the Sylvan Learning Center should call 1-888-EDUCATE to find the nearest testing center and set up appointments to take exams.

Distance Student Contact and Assignment Policies: Distance students are required to communicate with the faculty before the second class period. Distance students are expected to complete all of the regular requirements for a class. This includes submission of projects within 24 hours of the in-class students. These materials may be submitted electronically.

Course Schedule: Exam times and due dates of projects are as follows:

- Midterm Exam 1 9:30 AM - 10:50 AM Thurs. September 26th (Class 11)
- Midterm Exam 2 9:30 AM - 10:50 AM Thurs. October 24th (Class 19)
- Final Exam 3 8:00 AM - 10:30 AM Thurs. December 12th (Final)
- Project 1 12:00 PM Tues. October 1st (Class 12)
- Project 2 12:00 PM Tues. October 29th (Class 20)
- Project 3 12:00 PM Tues. December 3rd (Class 29)

The instructor for this course reserves the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.
