Course Description and Objectives

The mission of this course is to study the modeling and solution of decision problems with deterministic parameters using operations research techniques with a particular emphasis on solution algorithms.

Course Outline

i. Introduction to decision making, modeling, and operations research. Common concepts in optimization.

ii. Linear programming.
   a. Linear programming models.
b. Very brief review of linear algebra.
c. Simplex method for solving linear programming models.
d. Duality and sensitivity analysis.

iii. Special types of linear programming problems.
   a. Transportation and assignment problems.
   b. Network optimization problems.

iv. Integer linear programming problems and solution methods.

Recitations

During the recitation sessions, we will cover the assignment solutions in detail, and additional exercises may be provided.

Grading

1. Assignments (0%). Assignments will not be graded. However, we strongly recommend that you complete the assignments and you complete them individually. You are still expected to submit your completed assignments.

2. Quizzes (7%). There will be several pop quizzes during the lecture hours. Only the best three out of the first four will contribute to your final grade. Quizzes will be graded on a 0, 1, 1 basis.

3. Midterms (93%). There will be 3 midterm exams during the semester. The dates are March 17, April 21, and May 12. All exams are scheduled for 17:40-20:30.

4. There is no final.

5. There will be a single comprehensive makeup exam after the completion of the semester. Your makeup grade will replace your missing midterm grade(s). NO medical report is required to attend the makeup if you miss an exam.

6. You may opt for taking the makeup exam even if you do NOT miss any of the midterms. The makeup grade will replace your lowest midterm grade.

7. IBM ILOG CPLEX Optimization Studio project (8%). This project is optional, and by completing it successfully you may add up to 8 bonus points to your total course grade.

SUCourse

All content, assignments, announcements, etc., will be administered through SUCourse.

1. Follow all important dates pertaining to this course (exam dates, assignment deadlines) under “Schedule.”

2. All lecture slides, recitation notes, and assignment solutions will be available under “Resources.”

3. The assignment guidelines and the associated files will be provided under “Assignments.”
Textbook


Books on Reserve


Software

Information and support for all academic software provided by the university can be found at this link. Some homework problems may require formulating an integer or linear programming model and actually solving it with mathematical programming software. Several vendors offer such software, but in this course you are required to install and use IBM ILOG CPLEX Optimization Studio. We may briefly demonstrate this software during the lecture hours or the recitations, but it is primarily your responsibility to learn how to use it.

The installation files of IBM ILOG CPLEX Optimization Studio are at this link. You can only access the link from within the campus network or through a VPN connection if you are off-campus. Download the setup file (CPLEX_OPT_STUD_12.6.1_WIN_X86-32.exe if you have a 32-bit operating system, and CPLEX_OPT_STUD_12.6.1_WIN_X86-64.exe otherwise) and install the software. Documentation is installed automatically. For more information on this software product visit this link.