Economics 172B: Introduction to Operations Research B

Winter and Spring 2006

Syllabus and Reading List

The objective of this course is to provide you training in mathematical techniques used in optimization. These techniques can be applied in a wide variety of settings that have to do with logistics, production planning, and resource allocation. Particular topics covered in the class include linear, integer, and nonlinear programming.

Instructor:

Peter Katuscak: pkatuscak@ucsd.edu (please write ECON 172B in the email subject); Office: Economics 222

Office Hours:

Tue and Thu, 3:15-4:45pm in Economics 222 or 210, or by appointment

Teaching Assistants:

Ricardo Serrano-Padial: riserran@ucsd.edu; Office hours: Wed 1:30-3:00pm, or by appointment; Office: Economics 128
Erin Spenner: espenner@ucsd.edu; Office hours: Tue 11:00am-12:30pm, or by appointment; Office: Sequoyah 206

Lectures:

Tue and Thu, 5:00-6:20pm in Ledden Auditorium (HS&S 2250)

Discussion Sessions:

Purpose: to discuss homework problems and answer questions about lectures and readings
Mon 5:00-5:50pm in Center 222 and Tue 7:00-7:50pm in Peter 103

Principal Text:

Hillier, Frederick S. and Gerald J. Lieberman, *Introduction to Operations Research*, 8th edition, McGraw-Hill, 2005, ISBN 0-07-252744-7.

Note: The textbook should be available for sale at the UCSD Bookstore. It is also available from online merchants.

Prerequisite:

Economics 172A

Homework Assignments, Final Exam, and Grades:

An in-class midterm will be given on February 14. It will contribute 30% of your grade. The final will take place on March 20. Location will be announced in the university final exam schedule. The final will contribute 50% of your grade.

In addition, about 8 weekly homework problem sets will be assigned, and they will contribute 20% of your grade. The homework assignments will be posted on the website and due as announced. You will always have at least a week to complete your homework. There will be no homework due during the first week. From each homework assignment, one or more randomly selected problems will be graded and the score for that homework assignment will be determined based on the grade for the selected problems. Answers will be provided on the course website. Since the course builds up methods from the simplest problems to more complex settings, it is important to keep up with the material week by week. Apart from directly contributing to your grade, doing the problems will be a great practice for the midterm and the final. Not doing the problems will be risky and will significantly increase your chances of doing poorly in the course.

Homework Assignments and Solutions:

- Homework 1 (due Jan. 19); Solutions to Homework 1
- Homework 2 (due Jan. 26): Solutions to Homework 2
- Homework 3 (due Feb. 2): Solutions to Homework 3
- Homework 4 (due Feb. 9): Solutions to Homework 4
- Homework 5 (due Feb. 23): Solutions to Homework 5
- Homework 6 (due Feb. 30): Solutions to Homework 6
- Homework 7 (due Mar. 9): Solutions to Homework 7
- Homework 8 (due Mar. 16): Solutions to Homework 8

Additional Practice Problems and Solutions:

- Midterm practice problems
- Final practice problems

Exams:

- Midterm: solutions
- Midterm: results
- Final: solutions
- Final: results

Lectures, Topics, and Reading Assignments:

- **January 10, 12, 17, 22, and 24: Review of Linear Programming**
  Lecture 1, Lecture 2, Lecture 3, Lecture 4, Lecture 5
- **January 26, 31 and February 2, 7, and 9: Integer Programming**
  Lecture 6, Lecture 7, Lecture 8, Lecture 9, Lecture 10
- **February 14: In-class MIDTERM**
- **February 16: Overview of Nonlinear Programming**
  Lecture 11
- **February 21 and 23: Unconstrained Optimization**
  Lecture 12, Lecture 13
- **February 28 and March 2 and 7: Constrained Optimization with Karush-Kuhn-Tucker Conditions**
  Lecture 14, Lecture 15, Lecture 16
- **March 12, 14 and 16: Convex, Quadratic, and Non-convex Programming**
  Lecture 17, Lecture 18
- **March 20: Final Exam, 7-10pm**