Introduction to Operations Research
Economics 172B

Winter 2009

(as of late January 22, 2009)

Calendar:

Lectures: Monday, Wednesday, Friday: 10:00 - 10:50 AM, Ledden Auditorium. First class: January 5: Last class, March 13. No class on Monday, January 19 or Monday, February 16.

Midterm Examination: Wednesday, January 28, 2009, 10:00 - 10:50 AM, Ledden Auditorium.

Midterm Examination: Wednesday, February 25, 2009, 10:00 - 10:50 AM, Ledden Auditorium.

Final Examination: Friday, March 20, 8 – 11 a.m. , probably in Ledden Auditorium. Expect a review lecture the last day of class and a review session or sessions (question and answer only, no lecture) on Wednesday or Thursday, March 18 or 19.

Office hours and teaching assistants:

J. M. Marshall, Economics 109, office hours Monday and Friday 11:00 - 11:50 or by appointment (email me or call 858 534 8904 (no voice mail)), or drop in. E-mail: marshall@econ.ucsb.edu (Note Marshall's e-mail is ucsB, not ucsD). The subject line should begin with "Economics 172B" and your name.

Tom Daula, (tdaula@ucsd.edu) Tuesday 2:30 – 3:20, Economics 100, the computer room.

Daniel Lima, (dflima@ucsd.edu) Monday 2:30 – 3:20, Sequoyah 235.

Myungkyu Shim, (mkshim@ucsd.edu) Tuesday 4:00 - 4:50, Economics 100, the computer room.

Communications: Grades will be posted on WebCT. Please check them occasionally. A web site for the class will be at www.econ.ucsd.edu/~jmmarsha and follow the link.

Problem sets: due at the start of class on Wednesdays.

Grading: Midterms, each, 20%; Homework 10%; Cumulative Final 50%.

Text: Hillier and Lieberman, *Introduction to Operations Research*, McGraw-Hill, New York, recent editions.

Objectives: The following page references give an outline, not necessarily complete, of useful readings in the text. Page citations are to the eighth edition, which is the latest available to me.

Topic	pages
convexity and concavity	1006-13
unconstrained optimization	561-571
equality constraints	547-560
inequality constraints (KKT)	572-602
dynamic programming	440-465
search models	
inventory models	833-874
queuing models	765-784

Economics 172B Winter 2009

Some ground rules for problem sets and exams: I encourage you to work together on problem sets, but you must write up solutions on your own. You may not copy solutions or provide solutions to be copied. After working together or with the teaching assistants or with the off-campus tutor, put away the consensus solution, take a blank sheet of paper or a fresh spreadsheet, and create the whole thing yourself. Anything less is cheating yourself.

Many homework and examination items are answered with a limitation on space and words. Write the best answer that you can within the limits. Given the limits, you decide which parts are most important to write down. Outline the answer for yourself before writing it out for us, whether on homeworks or examinations. It also helps to connect the text to the diagrams and equations, which you do by labeling points in the diagrams (for instance by A, B, C, ...) or labeling equations (for instance by *, **, ***, ...) and then referring to the labels at the proper point in the text. You might write, "From the initial equilibrium of supply and demand, point A in the figure, the increase in demand leads to a new equilibrium at point B. Equation (*) gives the coordinates of point B." Practice the technique.

ECONOMICS 172B

Problem Set #1, due Wednesday, January 7, 2009

1. Consider the following modification of the hide-and-seek game discussed in class on Monday. If the prize is in door one it is **two** dollars; if it is in door two it is **three** dollars. Answer the questions below **on a excel spreadsheet** and print as a single page in portrait format with your name in the upper right hand corner.

   (a) The seeker's objective is to maximize V subject to $V \leq \min(2x_1, 3x_2)$. In fifty words or fewer explain why this objective might make sense.

   (b) Write the seeker's problem as a problem in linear programming and solve diagrammatically (using the drawing package in excel or similar). The answer is $V^* = 1.2$, $x_1^* = .6$, and $x_2^* = .4$.

   (c) Write the dual and show that its solution is $V'^* = 1.2$, $y_1^* = .6$ and $y_2^* = .4$. In fifty words or fewer describe the relation between the dual and the problem facing the hider.