Introduction to Operations Research  
Economics 172B  
Winter 2008  
(as of February 4)

Calendar:
Lectures: Monday, Wednesday, Friday: 11:00 - 11:50 AM, York 2622, except no class on Monday January 21 or Monday February 18.
Problem Solving sessions: Tuesday 5:00 - 5:50 (Mr. Kim) and 6:00 - 6:50 (Mr. Siga) in Peterson 102.
Midterm Examination: Wednesday, February 27, 2008, 11:00 - 11:50 AM, York 2622.
Final Examination: Monday, March 17, 2008, 11:30 AM - 2:30 PM, probably in the same room.

Office hours:
Marshall, Economics 109, office hours Monday 12:15 - 1:15 Wednesday 12:15 - 1:15 or by appointment (email me or call 858 534 8904 (no voice mail)), or drop in. E-mail: marshall@econ.ucsb.edu (Note the E-mail is ucsB, not ucsD). The subject line should begin with "Economics 172B."

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

Teaching assistants:
Kim, Chulyoung Sequoyah 224 chk002@ucsd.edu  
Monday 10:00 - 10:50, Tuesday 11:00 - 11:50.
Siga, Lucas Sequoyah 224 lsiga@ucsd.edu  
Tuesday 12:00 - 1:50

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

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


Objectives: The following page references give an outline, not necessarily complete, of useful readings in the text:

<table>
<thead>
<tr>
<th>Topic</th>
<th>pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>convexity and concavity</td>
<td>1006-13</td>
</tr>
<tr>
<td>unconstrained optimization</td>
<td>561-571</td>
</tr>
<tr>
<td>equality constraints</td>
<td>547-560</td>
</tr>
<tr>
<td>inequality constraints (KKT)</td>
<td>572-602</td>
</tr>
<tr>
<td>dynamic programming</td>
<td>440-465</td>
</tr>
<tr>
<td>search models</td>
<td></td>
</tr>
<tr>
<td>inventory models</td>
<td>833-874</td>
</tr>
</tbody>
</table>
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, put away the consensus solution, take a blank sheet of paper or a fresh spreadsheet, and create the whole thing 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 must decide which parts are most important to write down. You should 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, *, **, ***, ...) and then referring to the labels at the proper point in the text. For instance, 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." Practice the technique.

ECONOMICS 172B
Problem Set #1, due Wednesday, January 9, 2008

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 one dollar; 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 $V \leq \min(x_1, 3x_2)$. 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 $V^* = .75$, $x_1^* = .75$, and $x_2^* = .25$.

   (c) Write the dual and show that its solution is $V'^* = .75$, $y_1^* = .75$ and $y_2^* = .25$. In fifty words or fewer describe the relation between the dual and the problem facing the hider.