21-257 Models and Methods for Optimization
Fall, 2004

General Information

Time of Lectures:  MWF 2:30-3:20
Place:  PH 100
Prentice-Hall
Instructor:  Kasper Larsen
Office:  WEH, Room 6102
E-Mail:  kasper1@andrew.cmu.edu
Office Hours:  M 1:30-2:15 and W 4:30-5:30
Information:  All information (including homeworks, solutions and grades) can be found at http://www.cmu.edu/blackboard.

Substitute

Kelley Burgin will lecture the course the first two weeks.

Recitations

Recitation is scheduled in a way to help you answer questions about class and homework. Examples done in recitation will complement lectures. You should plan to attend all recitations and participate actively. Active participation will help foster understanding. Quizzes may also be given during recitation.
Recitation Schedule

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>R 11:30AM - 12:20PM</td>
<td>PH A22</td>
</tr>
<tr>
<td>B</td>
<td>R 12:30PM - 01:20PM</td>
<td>PH A20</td>
</tr>
<tr>
<td>C</td>
<td>R 12:30PM - 01:20PM</td>
<td>BH 235B</td>
</tr>
<tr>
<td>D</td>
<td>R 01:30PM - 02:20PM</td>
<td>DH 1209</td>
</tr>
<tr>
<td>E</td>
<td>R 02:30PM - 03:20PM</td>
<td>DH 2122</td>
</tr>
<tr>
<td>F</td>
<td>R 04:30PM - 05:20PM</td>
<td>WEH 6423</td>
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Prerequisites

21-256 Multivariate Approximation and Analysis or sufficient ability to use matrix operation such as row operations to solve linear systems of equation also known as Gauss-Jordan elimination.

Course Description

Operations Research (OR) originated as a branch of mathematics which was developed to solve economic and military logistic problems that arose during WW II. After the war, many other applications of OR were found in the business industry, the sciences, the stock market and even sports. Due to advancements in the field and in computer technology, more elaborate and sophisticated applications are considered now than during WW II.

Models and Methods of Optimization is an introduction to the basic methods of OR and is intended primarily for Business Administration and Economics majors. The course material contains a review of linear systems; a study of linear programming, including the simplex algorithm, duality, and sensitivity analysis; an introduction to integer programming, including the transportation and knapsack problems; and other structured problems. The course will emphasize applications of the techniques learned.

At the conclusion of the course, students will be expected to have gained the ability to

- Recognize a problem appropriate for solution by mathematical programming.
- Formulate a problem as a mathematical program when appropriate.
- Understand some of the mathematics underlying mathematical programming.
• Understand some of the algorithms and software used in mathematical programming.

Schedule

The schedule contains information about reading assignments and due dates for homework assignments. The schedule will be updated frequently. Check the Blackboard for the latest edition.

Class Procedures

There will be a reading assignment for each class - see the schedule. All materials will be posted on the Blackboard web site. In some lectures there will be a brief in-class quiz.

Evaluation

The components of the course will be weighted as follows in determining the course grade:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Test 1</td>
<td>20%</td>
</tr>
<tr>
<td>Test 2</td>
<td>20%</td>
</tr>
<tr>
<td>Homework and Quizzes</td>
<td>30%</td>
</tr>
<tr>
<td>Final</td>
<td>30%</td>
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All the tests will be in-class, closed book and note, but calculators allowed. All homeworks and quizzes will be weighted equally and graded on a ten point scale. The two lowest grades of both homeworks and quizzes will be dropped. For instance, if a student misses two in-class quizzes, those two zeros will be dropped and all the other quizzes and homeworks will be averaged to generate the Homework and Quizzes part of the grade. As a result, no make-up quizzes will be given for any reason, nor will any homework assignments be accepted late.

The letter grades are computed as follows: A 100-90; B 89-80; C 79-70; D 69-60; E 59-50.

Policies

Class attendance is expected. Make-up exams will be given for tests only in case of a documented legitimate excuse (illness, athletic event, etc.) You
should contact me as soon as you know you will miss the test. Make-up for
the final will only be given in exceptional circumstances, with approval of
the Assistant Department Head.

Academic honesty standards will be enforced. No collaboration on in-class
tests is allowed. All grades will be available online through the Blackboard
system. If you believe that a score has been recorded incorrectly, you have
one week from the time the assignment is returned to contact me about the
problem.

Homework

Doing problems is essential for understanding, and there will be frequent
homework assignments. See the schedule for due dates, e.g. homework as-
signment #1 is due on September 3.

Homework will be due at the beginning of class, and
access to the submitted homework will not be permitted
following the start of class. Make sure to include your
section letter.

The homework assignments will be posted at least one week in advance and
the solutions will be posted on the Blackboard the day after the homework
assignment is due. You will be expected to use Excel to do some homework
problems. The use of Excel to solve linear programming problems will be
discussed in class.

The teaching assistants have mailboxes located in WEH, Room 6113. You
can turn in your work there in advance of the lecture if you will be unable
to attend.

You are encouraged to discuss the assignments with other students. How-
ever, all the work submitted for grading must be written up individually, you
should not copy from anyone else or allow anyone to copy from your work. In
particular, you are expected to generate electronic documents from scratch.
You should mention the names of your collaborators on the front of your
paper, or next to the problem(s) you discussed with them.

Tests

Some students qualify for special accommodations such as extra time on
tests or special seating arrangements. If you have documentation supporting
such a request, please present it as soon as possible, and certainly well before
the first test. I will try to assist with reasonable requests.