Introduction to Operations Research
IE 220 — Spring 2012

Class Schedule	Tue and Thu 1:10-2:25
Instructor:	Katya Scheinberg
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office hours:	Tue and Thu 12:00pm – 1:00pm,
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Evaluation

Homework:		30%
Quiz #1:		17.5%
Quiz #2:		17.5%
Final exam:		25%
Class participation	(discretion of the instructor)	10%

Scope of the course

This course will introduce you to deterministic and stochastic models in operations research. You will learn to formulate, analyze, and solve mathematical models that represent real-world problems. In the first two-thirds of the course, we will discuss deterministic models, in which no uncertainty exists. This section of the course will cover linear programming and the simplex algorithm, as well as related analytical topics. It will also introduce other types of mathematical models, including transportation, network, integer, and non-linear models. The remaining third of the course will cover stochastic models that handle the randomness inherent in most real systems. Topics will include Markov chains and queuing models.

Course material

"Introduction to Operations Research" by F.S. Hiller and G.J. Lieberman, 9th ed., McGraw-Hill: New York, NY, 2005;

We will cover Chapters 1-6, 8-9, 11-12, and 16-17 of the textbook, with additional chapters added as time permits.

Prerequisites

IE 111 or Math 231 (probability and statistics).

Corequisites

You must take IE 122, Software Tools, while you are taking IE 220, unless you have taken it already.

Modeling tools/language

In this class we will make use of modeling language AMPL. You will learn this software packages in IE 122. You should download the student version of AMPL from http://www.ampl.com/DOWNLOADS/index.html.

Coursesite

Lecture slides, homework assignments and solutions, and other important materials will be posted on Coursesite. Please check there regularly. Exams: You will have two 75min in-class midterm exams and a three-hour final exam. The final exam will be cumulative. The exams will be closed-book, closed-notes. You may be allowed to bring in one handwritten sheet if I decide it is appropriate. I will announce this ahead of time. No make-up exams will be given, and no credit will be given for any missed exam. Homework: You will have regular homework assignments consisting of problems from the book.

Late Assignments

Homework assignments must be turned in during class on the day the assignment is due, unless otherwise specified. Homeworks will be penalized of **one third** for each day they are late. After three days, they will not be accepted. No exception.

Legibility

Homework must be typed or written neatly and with problems in the correct order. If we have difficulty reading or following your homework, we will not go to great lengths to decipher it!

Plagiarism Policy

I strongly encourage you to consult with your colleagues when you're working on homework. However, you will not understand the material thoroughly or do well on the exams unless the work that you turn in is ultimately your own. Therefore, you must write up your answers alone, and without looking at anything you wrote down while working with your group. This means that if you solved the problem with a friend, you're going to have to go home and solve it all over again, by yourself. If you wrote AMPL code with a friend, you're going to have to re-write it by yourself. The work you turn in must be your own. In your write-up, you must cite everyone with whom you worked or consulted about each problem, as well as any books or other references (other than Hillier and Lieberman and the lecture slides) that you used to solve the problem. For example: "I worked with Friendly McPal on this assignment, or I got help from Smarty McPants about problem #3, I consulted Linear Programming for Dummies, Section 4.2, by Dopey McBrain when solving question #2." Any breach of this policy will be considered an act of plagiarism, and no credit will be given for such assignments. Repeat offenses will be grounds for failure for the course.

Re-grade Requests

If you disagree with the grade you received on a homework or exam problem, you may submit a request for that problem to be re-examined. This request

must be turned in no more than 48 hours after you receive the graded assignment. Once we re-examine your work and decide whether to change your grade, our decision will be final.

Class Preparation and Participation

You are expected to come to class regularly and to be prepared for each class by reading the relevant sections of the textbook ahead of time. I will post slides on Blackboard in advance so that you may bring them to class if you wish. In addition, you are expected to participate in class discussions and ask questions when you are confused. A portion of your grade will be based on class participation.

Extended Absences

If you believe you will miss two or more consecutive lectures due to illness, family emergencies, etc., please contact me as early as possible so that we can develop a plan for you to make up the missed material. Under no circumstances will I give credit for missed homework or exams unless you have discussed your absence with me sufficiently in advance.

Accommodations for Students with Disabilities

If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted. For more information, please visit the student support services website:
http://www.lehigh.edu/~inacsup/disabilities.

Note: this syllabus is subject to change.

Topic	Week of
Introduction to Model Building Linear Programming	Jan 16
Linear Programming	Jan 23
Linear Programming	Jan 30
Simplex Method	Feb 6
Simplex Method	Feb 13
Duality and Sensitivity Analysis	Feb 20
Duality and Sensitivity Analysis	Feb 27
Spring Break	Mar 5
Transportation and Assignment Problems	Mar 12
Network Models	Mar 19
Network Models and Integer Programming	Mar 26
Integer Programming	Apr 2
Nonlinear Programming	Apr 9
Markov Chains	Apr 16
Queuing Models	Apr 23