IE220: Introduction to Operations Research

Instructor: Professor Frank E. Curtis
Office: Mohler 325
Phone: 610.758.4879
E-mail: `frank.e.curtis@lehigh.edu` (NetID `fec309`)
Textbook: F. S. Hillier and G. J. Lieberman, *Introduction to Operations Research*, 9th ed.
Lecture: Tuesdays and Thursdays, 9:20-10:35am, Mohler 375
Office Hours: Tuesdays, 10:35am-12:00pm and 1:30-2:30pm, Mohler 325
Teaching Assistant: Dan Li, `dal207@lehigh.edu`
Prerequisites: IE111 or Math231
Corequisites: IE122

Course Description: In this course you will be introduced to the processes of formulating, analyzing, and solving mathematical models of real-world problems. The models we discuss will fall into one of two categories: *deterministic* or *stochastic*. In the former case, the quantities defined in the model are assumed to be known and fixed. This section of the course covers linear, integer, and nonlinear programming problems and algorithms. In the latter case, the quantities defined in the model are assumed to be unknown (i.e. random), which in many situations is a more accurate way to model real systems. This section of the course covers Markov chains and queueing models.

Grading: Your grade will be calculated as follows:

Homeworks:	25%
Quizzes:	25% (12.5% each)
Midterm Exam:	25%
Final Exam:	25%

Homeworks: There will be regular homework assignments throughout the semester.

- Each homework must be turned in *at the beginning* of class on the day that it is due.
- *No credit* will be given for any late assignment.
- Your lowest homework grade will be dropped.
- You are free to consult with other students when working on homework. *However, the work you turn in must be your own.* Please cite any references you use.

Quizzes and Exams: There will be two quizzes (1/4 and 3/4 of the way through the course) and two exams (a midterm and final). All will be cumulative, closed-book, and closed-notes, though formula sheets may be provided.

Regrade Requests: If you disagree with a grade you receive on a homework or exam, then you may submit a regrade request. This request must be *in writing* and *submitted no more than 48 hours after you receive the graded assignment.*

Absences: Class attendance will not be recorded. However, you will be responsible for all material covered and announcements made in lecture. *It is your responsibility to contact me about any important information you might have missed in class if you were unable to attend.* If you believe you will miss numerous lectures due to illness, family emergencies, etc., then please contact me as early as possible. *Under no circumstances will I give credit for a missed homework, quiz, or exam unless you have discussed your absence with me in advance.*

Communication: Lecture slides will be posted on Blackboard within a day or two after each lecture. Homework assignments, solutions, announcements, and other important material will also be posted on Blackboard. Important information, comments, corrections, and updates about the course may also be sent via e-mail. If you have a question/concern, please feel free to submit it to me in an e-mail. However, if your e-mail requires a time-dependent response, then it is important that you *assume that I have not received any e-mail to which I do not respond within the day.*

Computers: In this class we will make use of the modeling language AMPL. You will learn how to use this software in IE122. You should download the student version of AMPL from `http://www.ampl.com/DOWNLOADS/index.html`.

Recording Devices: Voice and/or video recording devices may be used only with the approval of everyone in the classroom.

Students with Disabilities: If you have a disability for which you are or may be requesting accommodations, please contact me 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 Academic Support Services before accommodations can be granted.

Tentative Schedule:

Wk.	Tues.	Thurs.	Topics	Notes
1	8/25	8/27	Introduction, Linear Programming	
2	9/1	9/3	Linear Programming	
3	9/8	9/10	The Simplex Method	
4	9/15	9/17	The Simplex Method	
5	9/22	9/24	Duality, Sensitivity Analysis	Quiz 1
6	9/29	10/1	Transportation, Assignment Problems	
7	10/6*	10/8	Network Models	
8	10/13	10/15	Network Models, Integer Programming	Midterm
9	10/20	10/22	Integer Programming, Nonlinear Programming	
10	10/27	10/29	Nonlinear Programming	
11	11/3	11/5	Markov Chains	
12	11/10	11/12	Markov Chains	Quiz 2
13	11/17	11/19	Queueing Models	
14	11/24	11/26*	Queueing Models	
15	12/1	12/3	Review	

* indicates that no class will be held