ISYE 3133
Engineering Optimization
Summer 2015

Instructor: Dawn Strickland, dawn.strickland@gatech.edu

- Office hours: Wednesday, 1-2:30pm or by appointment, 203F Groseclose

Teaching Assistant: Yufeng Cao, cao.yufeng@gatech.edu

- Office hours: Tuesday, 1-4pm or by appointment, 449 Main

Exams and Grading

Your final grade will be computed as follows:

Homework, 10%
Midterms, 25% each (dates are given in the calendar below)
Final Exam, 40%

The final exam is scheduled for Thursday, July 30th, 2:50-5:40pm. All exams are closed-book and closed-notes. Calculators (and other electronic devices) are not permitted.

Absences

If you miss an exam for an excused reason, the weight of that exam will shift to the final. An unexcused absence will result in a grade of 0 for the exam. All excused absences must be verified by the Dean of Students. No makeup exams will be given.

Homework policy

Homework assignments are an important component of the course. You are welcome to collaborate with each other on homework problems, but the final write-up must be your own. It is in your interest not to copy someone else's work. The purpose of the homework assignment is for you to gain a mastery of the material covered during the lecture.

Textbooks

1) *Introduction to Mathematical Programming* by Wayne Winston (ISBN 0534359647)
2) (Recommended) *Applied Mathematical Programming* by Bradley, Hax, Magnanti; http://mit.edu/15.053/www

Tentative Schedule of Topics	
Tue 5/12	LP Formulation, Graphical Solutions
Thu 5/14	
Tue 5/19	
Thu 5/21	
Tue 5/26	Simplex
Thu 5/28	
Tue 6/2	Sensitivity
Thu 6/4	Review
Tue 6/9	**Midterm Exam 1**
Thu 6/11	Duality
Tue 6/16	
Thu 6/18	Networks
Tue 6/23	
Thu 6/25	
Tue 6/2	Integer Programming
Thu 6/30	
Thu 7/2	
Tue 7/7	Review
Thu 7/9	**Midterm Exam 2**
Tue 7/14	More IP
Thu 7/16	
Tue 7/21	Additional Topics
Thu 7/23	Review
Thu 7/30	**Final Exam 2:50-5:40pm**

Outcomes and their relationships to ISyE Program Outcomes

At the end of this course, students will be able to:

- Formulate deterministic mathematical programs in various practical systems
- Understand basic optimization techniques
- Be able to interpret the results of a model and present the insights (sensitivity, duality)
- Know the limitations of different solution methodology
- Use software to solve problems

Course outcome \ Program Outcomes	**a. apply math**	**b. Design, conduct experiment, analyze interpret data**	**c. Design system**	**d. team**	**e. problem solving**	**f. prof/ and ethical responsibilities**	**g. communication**	**h. global, eco, envi and soc context**	**i. Life-long learning**	**j. Contemporary issues**	**k. use tools for eng. practice**
Formulate math programs	H	H			H						
Understand optimization techniques	H										H
Interpret results		H			H						H
Know limitations of method					H					M	H
Use software		H			H			L		L	

- H, M and L denote high, moderate and low relationships.
- P: Team projects are sometimes conducted

Evaluation of the important outcomes

Four or more important outcomes will be evaluated from direct questions on the final exam:

1. Students are able to identify real-world objectives and constraints based on actual problem descriptions;
2. Students are able to create mathematical optimization models;
3. Students are able to work through proper solution techniques;
4. Students are able to make recommendations based on solutions, analyses, and limitations of models

ISyE ABET Student Outcomes a - k

a) an ability to apply knowledge of mathematics, science, and engineering

b) an ability to design and conduct experiments, as well as to analyze and interpret data

c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

d) an ability to function on multidisciplinary teams

e) an ability to identify, formulate, and solve engineering problems

f) an understanding of professional and ethical responsibility

g) an ability to communicate effectively

h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

i) a recognition of the need for, and an ability to engage in life-long learning

j) a knowledge of contemporary issues

k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.