

EBGN 325 - Applications of Operations Research

Fall 2017

Lectures	Monday, Wednesday, Friday	12:00pm - 12:50pm	Hill Hall 204
Instructor	Jennifer DiCarlo		
	Office:	BB 260	
	Office Hours:	Monday	1:00pm-3:00pm
		Tuesday	2:00pm-4:00pm
	email:	jldicarlo@mines.edu	
Teaching Assistant (TA)	Jesse Wales		
	Office:	BB 260	
	Office Hours:	Tuesday	9:00am-10:00am

GENERAL INFORMATION

- **Textbook:** Ragsdale. *Spreadsheet Modeling and Decision Analysis*, South-Western College Publishing, 6th edition. (Recommended)
- **Assignments:** There will be a weekly assignment due Wednesday (the following week). Please direct any homework grading questions to the TA, who will be grading the homework assignments. *Do not send email to the TA!!*
- **Exams:** There will be two midterms and a final examination. Exams are closed-book, closed-note and absolutely no calculators of any kind are permitted. You must wait 48 hours after the exam has been handed back to ask (me) any grading questions.
- **Grading:**
 - ★ Class Participation: 5%
 - ★ Homework Assignments: 25%
 - ★ Midterms: 40% (20% each)
 - ★ Final: 30%

Grading is done on a curve where 90% is sufficient but not necessarily necessary for an A, 80% is sufficient but not necessarily necessary for a B, etc.

- **Rules:**

- ★ Please do not send email regarding homework problems; come to office hours instead.
- ★ Statute of limitations for questions about grading is one week from the student's receipt of the graded work.
- ★ Do not harass the TA.
- ★ I do not want to see or hear your cell phone. Ever. This includes during office hours.
- ★ No rudeness of any kind towards anyone in the class will be tolerated.
- ★ Do not talk to your neighbor during class unless otherwise instructed.
- ★ You may confer with others regarding the homework and project, but the work you hand in must be your own. Please ensure it is done neatly.
- ★ Attendance in class is required. Be on time.
- ★ Any alternate arrangements for exams must be submitted in writing at least one week in advance of the exam. Any additional arrangements regarding disabilities must be *formally* and *legally* documented and approved.

A minor infraction of the above rules will result in a warning. A major infraction will result in expulsion from the class.

- **Important Dates:**

- ★ 9/4: Labor Day, No Class
- ★ Week of 10/9: First Midterm
- ★ 10/16 - 10/17: Fall Break (No Class)
- ★ Week of 11/13: Second Midterm
- ★ 11/10: Last Withdrawal Day
- ★ 11/22 - 11/26: Thanksgiving (No Class)
- ★ 12/7: Classes end
- ★ 12/9 -12/14: Finals Week

COURSE OUTLINE

- I. Linear Programming Models (~ 3 weeks)
 - ★ Introduction, history and background
 - ★ Formulations
 - ★ Linear programming in two dimensions
- II. Integer Programming Models (~ 2 weeks)
 - ★ General formulations
 - ★ Indicator variables and binary switches
 - ★ Model tractability (when compared with linear programs)
- III. Nonlinear Programming Models (~ 1 week)
 - ★ Problems with obtaining optimal solutions, e.g., local versus global optima
 - ★ Applications, particularly as they pertain to economic modeling
- IV. Network Models (~ 2 weeks)
 - ★ Minimum cost flow models
 - ★ Shortest path models
 - ★ Maximum flow models
- V. Queuing Models (~ 3 weeks)
 - ★ System configurations
 - ★ Arrival and service rates
 - ★ Analytical models
- VI. Simulation Models (~ 3 weeks)
 - ★ Random number generation
 - ★ Building and evaluating simulation models
 - ★ Constructing confidence intervals
- VII. Decision Analysis (~ 2 weeks)
 - ★ Value of information
 - ★ Building and analyzing decision trees