EBGN525 - Operations Research: Deterministic Optimization

Fall 2015

Lectures   Tuesday, Thursday 8:00am - 9:15am 326 Marquez Hall
Instructor  A. M. Newman
Office:     312 Brown Building
Office Hours: Tuesday 10:50am-11:50am
            Wednesday 5:00pm-8:00pm
email:      newman@mines.edu

Teaching    Mojtaba Rezakhah
Assistant   Office: W478 Brown Building
(TA)        Office Hour: Monday 9:00am-10:00am

GENERAL INFORMATION

• **Credit:** This course is a three-hour lecture and credit-hour class. It is required for Engineering and Technology Management students; it is an elective in other programs. Please consult your program of study for further details.

• **Textbook:**


• **Blackboard:** There is a blackboard site for this course, listed as EBGN525, Deterministic Optimization. The bulletin description, policy on academic integrity and misconduct, solution sets, class handouts, and grades can be found there.

• **Assignments:** There will be a weekly assignment, handed out on Thursday every week, due the following Thursday in class, and handed back (graded) the Tuesday after that. 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. The second midterm will be held on Tuesday, November 3. You may bring one sheet of paper to the exams. You must wait 48 hours after an exam has been handed back to ask (me) any grading questions.
• Grading:
  * Class Participation: 5%
  * Homework Assignments: 25%
  * Midterms: 40%
  * 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.

COURSE OUTLINE

• I. Linear Programming Models (~ 4 weeks)
  * Introduction, History and Background
  * Formulations
  * Linear Programming in Two Dimensions
  * Sensitivity Analysis

• II. Network Models (~ 4 weeks)
  * Transportation Models
  * Assignment Models
  * Transshipment Models
  * Minimum Cost Flow Models
  * Shortest Path Models
  * Maximum Flow models

• III. Integer Programming Models (~ 4 weeks)
  * General Formulations
  * Logical Constraints
  * Indicator Variables and Binary Switches
  * Set Packing, Partitioning, and Covering
  * Model Tractability (when compared with linear programs)

1Students will be required to know the following material as the “learning outcome” of the class.
• IV. Nonlinear Programming Models (∼ 4 weeks)
  
  ⋅ Problems with obtaining optimal solutions, e.g., Local versus Global Optima
  
  ⋅ Applications, particularly as they pertain to economic modeling

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 TAs.

• 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.

• 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.