OR/MATH 441: Deterministic Operations Research

Spring 2009
Science & Technology I, room 212
Monday & Wednesday, 10:30-11:45am

Professor: Stephen G. Nash
Office: Science & Technology II Bldg., room 122A
Phone: 703-993-1678
E-mail: snash@gmu.edu

Office hours: Monday 2-4pm, and by appointment; via e-mail at other times

Prerequisite: MATH 203

All course materials will be posted at http://courses.gmu.edu

Textbook: *Operations Research Applications and Algorithms*, Wayne L. Winston (4th edition)
Software: *MPL*, available from www.maximal-usa.com

Overview: This course will introduce the basic mathematical ideas and methods of Deterministic Operations Research. We will discuss modeling real life problems, the basic concepts of Linear Programming (LP), and methods for solving LP problems. We are going to discuss briefly some concepts of nonlinear optimization and their applications. There will be a project, which requires modeling real life problems using MPL languages available for downloading from the Internet (www.maximal-usa.com).

Tentative Course Schedule

Date	*Topic*	*Chapters*
1/21	Introduction to Operations Research	1
1/26	Linear Programming (I)	3.1-3.2
1/28	Linear Programming (II)	3.3-3.4
2/2	Linear Programming (III)	3.5-3.9
2/4	The Simplex Method (I)	4.1-4.2
2/9	The Simplex Method (II)	4.5
2/11	The Simplex Method (III)	4.6-4.8
2/16	The Simplex Method (IV)	4.12
2/18	Sensitivity Analysis & Duality (I)	6.1-6.2
2/23	Sensitivity Analysis & Duality (II)	6.3
2/25	Sensitivity Analysis & Duality (III)	6.5-6.7
3/2	Sensitivity Analysis & Duality (IV)	6.8-6.9
3/4	Review	
3/9	[no class; spring break]	
3/11	[no class; spring break]	
3/16	The Transportation Problem (I)	7.1
3/18	*Midterm* (Transportation problem NOT on midterm)	

3/23	The Transportation Problem (II)	7.2
3/25	Networks (I)	8.1-8.2
3/30	Networks (II)	8.3, 8.6
4/1	Integer Programming (I)	9.1-9.2
4/6	Integer Programming (II)	9.3
4/8	Integer Programming (III)	9.5
4/13	Integer Programming (IV)	9.7
4/15	Nonlinear Programming (I)	11.1-11.3
4/20	Nonlinear Programming (II)	11.4, 11.6
4/22	Nonlinear Programming (III)	11.8
4/27	Nonlinear Programming (IV)	11.9
4/29	Nonlinear Programming (V)	11.10
5/4	Review	
5/6	*Final Exam (10:30am-1:15pm)*	

Grading:

10%	Class Participation
20%	Homework
25%	Midterm exam
15%	Computational project
30%	Final exam