OR/MATH 441: Deterministic Operations Research

Fall 2009
Innovation Hall 136
Monday & Wednesday, 1:30-2:45pm

Professor: Stephen G. Nash
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Office hours: Monday 10am-noon, 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*	
8/31	Introduction to Operations Research	1	
9/2	Linear Programming (I)	3.1-3.2	
9/7	[no class; Labor Day]		
9/9	Linear Programming (II)	3.3-3.4	
9/14	Linear Programming (III)	3.5-3.9	
9/16	The Simplex Method (I)	4.1-4.2	
9/21	The Simplex Method (II)	4.5	
9/23	The Simplex Method (III)	4.6-4.8	
9/28	The Simplex Method (IV)	4.12	
9/30	Sensitivity Analysis & Duality (I)	6.1-6.2	
10/5	Sensitivity Analysis & Duality (II)	6.3	
10/7	Sensitivity Analysis & Duality (III)	6.5-6.7	
10/13	Sensitivity Analysis & Duality (IV)	6.8-6.9	**[NOTE: Tuesday class]**
10/14	Review		
10/19	The Transportation Problem (I)	7.1	
10/21	*Midterm* (Transportation problem NOT on midterm)		
10/26	The Transportation Problem (II)	7.2	

10/28	Networks (I)	8.1-8.2
11/2	Networks (II)	8.3, 8.6
11/4	Integer Programming (I)	9.1-9.2
11/9	Integer Programming (II)	9.3
11/11	Integer Programming (III)	9.5
11/16	Integer Programming (IV)	9.7
11/18	Nonlinear Programming (I)	11.1-11.3
11/23	Nonlinear Programming (II)	11.4, 11.6
11/25	[no class; Thanksgiving break]	
11/30	Nonlinear Programming (III)	11.8
12/2	Nonlinear Programming (IV)	11.9
12/7	Nonlinear Programming (V)	11.10
12/9	Review	
12/16	*Final Exam (1:30pm-4:15pm)*	

Grading:

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