

Syllabus for SA401

LINEAR MODELS AND OPTIMIZATION

Spring Semester, 2005-2006

TEXT: *Linear Programming with the Voyage 200 and MS Excel's Solver*, Thomas J. Sanders and W. Charles Mylander

Prerequisites: A course in linear or matrix algebra. (SM261)

NOTES:

1. A web site at <http://www.usna.edu/MathDept/website/courses/spring2005-2006.html> will have the most up to date information about the course, including this syllabus, practice exams, web links, etc.
2. All students in this course are expected to have a calculator like the VOYAGE 200 with the capabilities to do symbolic calculations. There will be assignments that use such a calculator as well as questions on the common final exam on which it is expected that the student has such a calculator. The above web site also has a list link to a file with a list of the minimal competences expected of all students.
3. If you would like help in the course, you should contact your instructor for extra-instruction.
4. Exercises that ask for verbal explanations should be answered with complete sentences.

Reference Books:

1. R. L. Rardin, *Optimization in Operations Research*, Prentice Hall, 1998.
2. C. T. Ragsdale, *Spreadsheet Modeling and Decision Analysis* (3rd edition), South-Western College Publishing, 2001.
3. W. L. Winston, *Operations Research: Applications and Algorithms*, PWS-Kent Publishing Company, 1987.

CALCULATOR NOTES

The latest version of the VOYAGE 200 guidebook in PDF format is at <http://education.ti.com/us/product/tech/89ti/guide/guidesgsVoy.html>

Syllabus

No.	Date	Topic	Problems	M&S Reading
1	1/9/2006	Overview of LP	M&S 1.2 a,b,c	1.1 & 1.2
2	1/11/2006	Dual problem Farmer Brown	M&S 1.1, 1.3	1.3 - 1.6
3	1/13/2006	LP model outcomes	M&S 1.4	
4	1/16/2006	Matrix Algebra Review		
5	1/18/2006	Standard & Basic Canonical forms	M&S 2.1, 2.2, 2.3	2.1-2.2, 6.1-6.3
..	1/20/2006	King Holiday		
7	1/23/2006	Pivoting in standard tableau	M&S 2.8,2.9, 6.6, 6.7	6.4
8	1/25/2006	Pivoting on Voyage 200	M&S 2.1	2.3-2.5
9	1/27/2006	The Dual Simplex Method	M&S 2.5,2.6	2.6
10	1/30/2006	Activity Analysis and LP Models	M&S 6.9	2.7-2.11
11	2/1/2006	2-Phase Simplex Method	M&S 2.10, 2.11a	6.5-6.6
12	2/3/2006	Review		
13	2/6/2006	Hour Exam #1		
14	2/8/2006	Model Formulation	M&S 3.1	3.1
15	2/10/2006	EXCEL Solver	M&S 3.2	3.2
16	2/13/2006	Scheduling	M&S 3.5	3.3
17	2/15/2006	Multiperiod Planning	M&S 3.7	3.4
18	2/17/2006	Blending	M&S 3.10	Handout
19	2/20/2006	President's Day Holiday		
20	2/22/2006	Review	M&S 3.9	
21	2/24/2006	Review		
22	2/27/2006	Hour Exam #2 Part I		
23	3/1/2006	Hour Exam #2 Part II Modeling in CH119		
24	3/3/2006	Review Test		
25	3/6/2006	Transportation model	Handout	Handout
	3/8/2006	No Class	MORS Education Colloquium	
	3/10/2006	Assignment Problem	Handout	Handout
	3/11-3/19	Spring Break		
26	3/20/2006	Generalized Assignment Model	Handout	Handout
27	3/22/2006	Network Flows	Handout	Handout
28	3/24/2006	Sensitivity Analysis	M&S 4.5	4.1-4.2
29	3/27/2006	Sensitivity Analysis	M&S 4.7	4.3-4.4
30	3/29/2006	Cost Ranging	M&S 4.6, M&S 4.8	4.5-4.7
31	3/31/2006	Cost Ranging		4.5-4.7
32	4/3/2006	Duality	M&S 5.2, 5.3	5.1-5.3
33	4/5/2006	Duality	M&S 5.4	5.1-5.3
34	4/7/2006	Duality		5.1-5.3
35	4/10/2006	Review		
36	4/12/2006	Hour Exam #3		
37	4/14/2006	Min Project presentations		
38	4/17/2006	Min Project presentations		
39	4/19/2006	Min Project presentations		
40	4/21/2006	Min Project presentations		
41	4/24/2006	Xpress Introduction		
42	4/26/2006	Review		
43	4/28/2006	Review	Last day of Classes	