ENG M 540 Course Outline

Optimization Models and Algorithms

September 2009 – December 2009
Thursdays 6:00 PM to 9:00 PM
Room: MEC 2-1

Instructor: **John Doucette**

Office: 5-8F Mechanical Engineering Building (5th floor West)

Office Hours: my door is always open… stop by any time

Web-Site: http://www.mece.ualberta.ca/~doucette/engm540/

Textbook (available at the UofA Bookstore):

- W. L. Winston, *Operations Research: Applications and Algorithms, 4th Edition*, Thomson Learning, Belmont, CA, 2004. (ISBN 0-534-38058-1)

Marking Scheme*:

Assignments**:	15%
Project:	25%
Exam #1:	30%
Exam #2:	30%

* Grades will roughly follow the recommended grade distribution provided by the registrar's office.

** Assignments must be handed in **during class** on the due date. Complete solutions will be provided on the course web-site shortly after the due date of each assignment, and assignments will not be accepted after solutions have been posted.

Course Objectives: The purpose of this course is to introduce graduate-level engineering students to optimization and linear programming techniques. ENG M 540 is also open to senior undergraduate students as a technical elective.

Course Content: The applications of optimization methods in solving engineering management problems. Both modeling techniques and algorithms will be covered. Specific topics include linear programming, formulation and modeling techniques, the simplex method, sensitivity analysis, duality, transportation and network problems, algorithmic and heuristic methods, integer programming, and/or non-linear programming.

Course Format: This course will be lecture based, primarily using white-board instruction. This will be supplemented with PowerPoint slides for key illustrations, in-class discussion, and problem-solving examples. All recommended reading and other external resources will be contained in the course text-book, supplemental handouts, and on the course web-site, which I will endeavour to keep updated with relevant materials in advance.

<u>Tentative</u> Course Schedule (subject to change):

Lecture #	Date	Topic	Chapter
1	03 Sept 2009	Course Introduction	-
		Introduction to Optimization and Modeling	1
2	10 Sept 2009	Linear Programming - Graphical	3
3	17 Sept 2009	Linear Programming - Models	3
4	24 Sept 2009	Simplex Method	4
5	01 Oct 2009	Simplex Method (cont'd)	4
6	08 Oct 2009	More on Linear Programming - Models	3
7	15 Oct 2009	**Exam #1**	-
8	22 Oct 2009	Sensitivity Analysis	5-6
9	29 Oct 2009	Transportation Problems	7
10	05 Nov 2009	Transportation Problems (cont'd)	7
11	12 Nov 2009	Network Models	8
12	19 Nov 2009	Integer Programming	9
		catch-up, review, project help	-
13	26 Nov 2009	**Project Presentations**	-
14	03 Dec 2009	**Exam #2**	-

Note: The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.ualberta.ca/secretariat/appeals.htm) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

Policy about course outlines can be found in Section 23.4(2) of the University Calendar.