Linear Programming
Math3801A, Fall 2015

Instructor: Dr. Steven Wang, 4368HP
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Lectures: Tuesday, Thursday 10:05am - 11:25pm, River Building, 3201

Tutorials: Friday, 1:35am - 2:25pm, Southam Hall 318

Office hours: Thursday 2:00-3:00pm;
                 Other time is available by appointment.

Textbook: Linear Programming, An Introduction with Applications, Academic Press, Inc., Harcourt Brace Jovanovich, Publishers, 1993 (or 2014), by Alan Sultan, reproduced by Carleton University Graphic Services.

Prerequisites: MATH 1102 OR MATH 2107, OR permission of the School.

Course Objective: The purpose of this course is to introduce students to the methods and techniques of some key areas of Mathematical Programming and Operations Research (OR). The discipline of Operations Research began just before the outbreak of World War II, and led to the introduction of the scientific method in making military and business decisions. These methods are now routinely used in Economics, Engineering, Agriculture and Transportation.

Evaluation: Midterm (20%), Tutorials (4%), Assignments (16%), and Final Examination (60 %).

Tutorials: Tutorials begin on September. 25, 2015. Tutorials are a very important part of this course. In each tutorial you will be given some questions to work on. You are grouped in a team of four or five students. You may have discussions with the TA and/or your study partners about the tutorial questions. At the end, each team submits one set of answer to the TA. Each member will have the same mark (0, or 2, or 4). TA's name and office hour

will be announced later.

Midterm: The Midterm exam (**Nov. 5**) worth 20 marks. No make up, early or delayed tests will be given. Medical excuses, other than hospitalization, will not be considered.

Assignments: Two assignments (8 marks each). Due dates: **Oct. 16 and Nov. 20**. Submit your assignments to your TA during the tutorial time on due dates.

Final Examination: This is a three hour closed-book exam scheduled by the University and will take place sometime during the examination period (Dec. 9- Dec. 21).

Academic Accommodation
You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: http://carleton.ca/equity/accommodation/student_guide.htm

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: http://carleton.ca/equity/accommodation/student_guide.htm

Students with disabilities requiring academic accommodations: in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability-related needs. Documented disabilities could include but are not limited to mobility/physical impairments, specific Learning Disabilities (LD), psychiatric/psychological disabilities, sensory disabilities, Attention Deficit Hyperactivity Disorder (ADHD), and chronic medical conditions. Registered PMC students are required to contact the PMC, 613-520-6608, every term to ensure that I receive your Letter of Accommodation, no later than two weeks before the first assignment is due or the first in-class test/midterm requiring accommodations. If

you only require accommodations for your formally scheduled exam(s) in this course, please submit your request for accommodations to PMC by the last official day to withdraw from classes in each term. For more details visit the PMC website: http://www.carleton.ca/pmc/students/acad_accom.html

Math3801 Tentative lecture schedule–subject to change

Week	Dates	Sections	Topics
1	Sep. 3	1.1-1.2	Introduction, formulation of Linear Programs
2	Sep. 7-11	2.1–2.4	Geometric Methods
3	Sep. 14-18	3.1–3.3	The Simplex Method
4	Sep. 21 - 25	3.4–3.6	The Simplex Method, Two Phase Methods
5	Sept. 28-Oct. 2	3.7, 3.9,	Alternate Optimal Solutions
6	Oct. 5-9	4.1, 4.2, 5.1, 5.2	Degeneracy, Bland's rule, Duality
7	Oct. 12-16	5.3-5.5	Duality, Complementary Slackness no class on Thanksgiving Monday Oct. 12 Assignment # 1 due on Oct. 16
8	Oct. 19-23	6.1–6.6	The Dual Simplex Method, Sensitivity Analysis
9	Oct. 26 -30		reading week, no class
10	Nov. 2-6	9.1–9.3, 9.5	The Transportation Problem, The U-V Method Midterm (Nov. 5)
11	Nov. 9-13	9.8, 10.1–10.2	Assignment Problem, Integer Programming
12	Nov. 16-20	10.3-10.4	Cutting Methods, Branch and Bound Methods Assignment # 2 due on Nov. 20
13	Nov. 23-27	8.1-8.5	Two person zero sum games, Saddle points, connection with linear programming
14	Nov. 30-Dec. 4	8.5-8.7	Solving matrix games; course review.