

MATH 340: LINEAR PROGRAMMING

Sometimes called LINEAR OPTIMIZATION

Course Outline, January 2012

(2 pages)

SCHEDULE: Section 201, 9:30-11:00 MWF in MATH 104

INSTRUCTOR: Richard Anstee

Office: Math Annex 1114, phone 604 822-6105

email anstee@math.ubc.ca

Home: phone 604 325-8877

OFFICE HOURS: 4-5 Wed in MATX 1118 (I will have to cancel Jan 18, Feb 15 and Mar 14 for Senate meetings) but you can try anytime (I usually arrive by 9:00am). I suggest Tuesday 3-4 would also work. I have chosen a late afternoon time because that has proven convenient for most students but I am happy to arrange other times. I will email the class and try to post on our website changes to this schedule.

WEBSITE: <http://www.math.ubc.ca/~anstee/math340/math340.html>

TEXT: *Linear Programming* by Vašek Chvátal. The book is a rather poor quality reprint. The textbook is short of examples and is rather dense for novices but it has excellent supplementary material and made the excellent choice of the dictionary format. I will be posting a significant amount of material on the web to supplement the text. The 'extra' chapters beyond the basics (Chapter 11 and later) make good reading. It is a superb reference although not always the perfect text.

OUTLINE:

Simplex Method (chapters 1-4,8)

2 weeks

Duality Theory (chapters 5,9)

2 weeks

Revised Simplex Method (chapters 6,7)

2 weeks

Sensitivity Analysis (chapter 10)

2 weeks

Optional topics: (note: students can influence the choice of topics) Applications and some modelling techniques (chapters 11-14), Game theory (chapter 15), Non-linear Programming and the Karush-Kuhn-Tucker conditions, General Upper Bounding (chapter 25).
3 weeks

GRADING: The grade will be computed as 55% final; 15% midterm; 30% quizzes and assignments.

QUIZZES: Emphasis on computational problems. They will be 20 minutes in length. Practice questions will be posted in advance.

ASSIGNMENTS: There will be 5 assignments. They will have an emphasis on theory. Some assignments will give computational questions and you will be able to utilize LINDO and LINGO software for Linear programming (available in the computer lab in LSK 310; you will be given accounts) or software of your choosing. Students may work together on assignments but must write up their solutions independently. Copying is forbidden. Any 2 (or more) assignments with some virtually identical answers deemed the result of copying will be given 0 total credit. The students are reminded of the plagiarism policies of the University.

MIDTERM: In class, scheduled for Thursday Feb 16.

FINAL: 3 hours.

MISSED WORK: From time to time students may be unable to finish assignments or attend midterms or the final exam. In the case of the Final Exam, the students should contact the Faculty of Science office and the missed final will be handled in a formal way. In the case of assignments,

please contact me before class time on the due date, and give your reasons for the missed work. Assuming the reasons are legitimate, I will note that you will be missing the assignment. A missed midterm/quiz can be handled in a similar way, if you contact me before the test time. In such circumstances your grade is computed out of a smaller number than 100 and then scaled appropriately to get a grade out of 100. For example, if a midterm counts 15% and a student informs me in advance of legitimate reasons for missing the midterm, the student would have a grade computed out of 85 and then this would be scaled to a grade out of 100 by multiplying by $100/85$. Without advance notice (to me by email or phone message to Math Office etc) the default will be a grade of 0 in the missed work but you may contact me. A student must finish a significant amount of term work in order to pass.