

# MATH 340: LINEAR PROGRAMMING

January 2018

**SCHEDULE:** Section 202, 12:00-1:00 MWF in BUCH A201

**INSTRUCTOR:** Richard Anstee

Office: Math Annex 1114, phone 604 822 6105  
email [anstee@math.ubc.ca](mailto:anstee@math.ubc.ca) Home: phone 604 325 8877

**OFFICE HOURS:** 11:00-11:50 MW, but you can try anytime (I usually arrive by 9:00am). I will try to post on the website any changes to this schedule. I hope to have office hours Thursday 5-6 if there is a quiz or assignment due the following day.

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

**TEXT:** *Linear Programming* by Vašek Chvátal. The textbook is short of examples and is rather dense for novices but it has 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 on) 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), Branch and Bound, 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. There will be 5 quizzes. They will be 25 minutes in length. Practice questions will be given in advance. Students, at the beginning of term, can opt out of quizzes if they wish and grades will be computed accordingly.

**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 the computer Lab and the 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 Friday 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 given 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.