

Math 340: Linear Programming

September–December 2016

Instructor: Omar Antolín Camarena, oantolin@math.ubc.ca

Course website: <http://www.math.ubc.ca/~oantolin/math340>

Description: Linear Programming means maximizing or minimizing linear functions of variables subject to linear equations or inequalities (“Linear Optimization” would be a more descriptive name).

Classes: Monday, Wednesday and Fridays from 2pm to 3pm in Mathematics Annex 1100.

Office Hours: These will all be held in LSK 300, *tentatively* scheduled as follows: Wednesdays 12:30pm–1:30pm, Thursdays 11am–12pm, Fridays 3pm–4pm. Or by appointment: just email me with 340 somewhere in the subject line.

Textbook: *Linear Programming* by Vašek Chvátal.

Course Outline: Basic topics:

- Simplex Method (chapters 1–4 & 8)
- Duality Theory (chapters 5,9)
- Revised Simplex Method (chapters 6,7)
- Sensitivity Analysis (chapter 10)

After that we will cover some of the following 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)

Grading: 55% final, 15% midterm, 15% quizzes and 15% assignments.

Quizzes: These will be mostly computational problems. There will be 5 quizzes of 25 minutes in length. Practice questions will be given 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 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.

Midterm: There will be one hour long midterm, during class.

Final: The final will be 3 hours long.