

Overview for Math 441 (Mathematical Modeling: Discrete Optimization Problems)

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Class: MWF 4:00–4:50pm
Math Building, room 102
Office Hours: TBA or by appointment

<http://www.math.ubc.ca/~jf/courses/441> is currently the location of the most up-to-date versions of all handouts for this course, homework, deadlines, etc.

Overview: This course focuses on a research project that is an application of linear programming (from Math 340); there will also be some new material taught in linear programming, beyond what you have seen in Math 340. For B.A. students, this course counts as a “research intensive approved course.”

Prerequisite: Math 340 is a prerequisite for this course.

Grading and Project Deadlines: Your grade will be based on:

Research proposal: 10%, due October 6. Who is in your group, what are you modelling, what data will you use, list three questions you want to investigate; motivate and clearly write this up in a formal report.

Progress report: 10%, due October 27: you should have a formal writeup of (1) your introductory section (non-technical), (2) precise framework of your problem, (3) explain where your data comes from, (4) partial results, (5) any obstacles you have encountered, (6) your plan for the rest of the project. You should have partial results to present to the class.

Presentations to the class: 10%, during part of class time, from mid October onward; each member of your group must present some material. Presentations will be based on the progress report; time permitting, some groups may be able to give a short, earlier presentation based on the proposal.

Final written project: 50%, due November 22; (nine days before the course ends).

Homework on new material: 20%, assigned throughout the course.

As in previous years, the grading and grade distribution will be reminiscent of an Arts course; historically the average has been in the low 70's, and top marks are only given for projects with clear and interesting writeups of difficult research. Historically projects usually obtain good results, but only occasionally have a stellar writeup.

Research Projects: Research projects can be done in groups of 3 students; depending on enrolment, there will be some flexibility in group sizes. Projects generally model something in the real world and involving linear programming (e.g., simplex method for solving LP's, branch and cut method for solving integer LP's, etc.). Most projects involve some data, real or (partially) synthetic; finding the real data or generating realistic synthetic data can be a significant part of the problem.

See the course website for more details.

Homework: Late homework will not be accepted. Your two lowest scores will be dropped in the overall homework computation.

Midterm and Final: There are no exams in this course.