



Optimization Methods for Financial Modelling 2014/2015

[Financial Modelling 3817B Section 001](#)

Course Outline

Instructor Information

Instructor	Zinovi Krougly
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Office Hours	TBA

Course Information

Course Description	An introduction to linear programming, simplex method, duality theory and sensitivity analysis, formulating linear programming models, nonlinear optimization, unconstrained and constrained optimization, quadratic programming. Applications.
Prerequisites	Mathematics 1600A/B or the former Linear Algebra 1600A/B and one of Calculus 2303A/B, 2503A/B or 2402A/B. Mathematics 1600A/B or the former Linear Algebra 1600A/B and one of Calculus 2303A/B, 2503A/B or 2402A/B
Antirequisites	The former Applied Mathematics 3817A/B
Pre,Co-requisites	Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. You can be deregistered at any time even after writing the final exam. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites
Warning	
Lecture Hours	Mon,Wed,Fri 9:30 AM-10:30 AM UCC 67;

Book Information

Text Book(s)

Introduction to Operations Research, by F. Hillier and G. Lieberman, McGraw Hill, 10th ed., 2014.

Reference Books

Optimization in Operations Research, by R. Rardin, Prentice Hall, 1998

Library Reserved Books

Rardin's text will be held the Taylor library on a reserve basis

Course Objectives

Timings given are approximate

- Classification of Optimization Problems, Introduction to Linear Programming,



Graphical Solutions (1/2 week) Solving Linear Programming Problems: Simplex Method (1 weeks)

- Simplex Method in Matrix Form, Revised Simplex Method (1 week)
- Sensitivity Analysis and Duality, Economic Interpretation of Duality (1 week)
- Nonlinear Programming and Multi-variable Optimization, Nonlinear Equations (3 weeks)
- Constrained Nonlinear Optimization, Lagrangian, Penalty and Barrier Methods (2 week)
- Optimization Using Quadratic Forms, Quadratic Programming (1.5 weeks)
- Discrete Optimization, Branch and Bound Methods (1 week)
- Applications: Portfolio Optimization, Optimization Toolbox (1 week)

Assessment

Assignments and/or Quizzes

Assignment 1 - February 4, 2015

Assignment 2 - February 25, 2015

Assignment 3 - March 11, 2015

Assignment 4 - April 1, 2015

Midterms or Tests

Wednesday, February 11, 2015

Final Exam

TBA

Evaluation

5% Assignment 1

30% Midterm

5% Assignment 2

5% Assignment 3

5% Assignment 4

50% Final Exam

The final exam will cover the entire course but with greater emphasis on the topics taught after the midterm. Class participation will be considered in assessing final grades, and may result in up to a 2% bonus in certain situations.

Department Policy on Missed Course Requirements and Student Health and Wellness

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your Dean's office as soon as possible, and contact your instructor immediately. If accommodation is approved by your Dean's office, your instructor will be notified, then it is your responsibility to make alternative arrangements with your instructor. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see:



http://www.stats.uwo.ca/accommodation_medical.pdf. A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility. The form can be found at: <http://www.stats.uwo.ca/medicalform.pdf>. Or, request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services.

Missed Midterm or Test: The policy of the department of Statistical and Actuarial Sciences is that there will be no make-up exams for a missed midterm. For those that do legitimately miss a midterm and provide the required supporting documentation, the standard practice will be that the weight of the midterm will be reassigned to the final exam. If your reason is not deemed valid, then you will receive a mark of 0.

Student Health and Wellness: As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page <http://www.music.uwo.ca/>, and our own McIntosh Gallery <http://www.mcintoshgallery.ca>. Information regarding health- and wellness-related services available to students may be found at <http://www.health.uwo.ca/>.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.html.

To help you learn more about mental health, Western has developed an interactive mental health learning module, found here: http://www.health.uwo.ca/mental_health/module.html. This module is 30 minutes in length and provides participants with a basic understanding of mental health issues and of available campus and community resources. Topics include stress, anxiety, depression, suicide and eating disorders. After successful completion of the module, participants receive a certificate confirming their participation.

Email Communication

You are welcome to communicate with your instructor by email, but email communication should only be used to provide them with information or to ask a question that requires a brief response. For more lengthy discussions and for discussions on lectures/course material please see your instructor during their scheduled office hours or by appointment. If you do email them, please use your UWO account, as these are often the only emails read (as emails sent from other addresses often get spammed).

Attendance

Classroom attendance is viewed as an important part of the learning process. Students are advised that excessive absenteeism may result in the student being disbarred from the final exam (see Western Academic Calendar).

Classroom Environment

The Department has adopted a "Mutual Expectations" policy governing the classroom environment and all work submitted by students. The full text of the policy can be found at: http://www.stats.uwo.ca/mutual_expectations.pdf. In summary, the policy was developed under the premise that all interactions between students and faculty should be governed by the principles of courtesy, respect and honesty. Students who are in emotional/mental distress should refer to Mental



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Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.