

Business 9802 – Management Science I

Winter 2024

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Fridays 09:00 a.m. – 12:00 noon
Location: Room 2348
(12 Sessions)

COURSE DESCRIPTION

The class meets once a week for 3 hours. Each 3-hour class includes both leading lectures and articles. This course will focus on topics in deterministic optimization including linear programming, duality and sensitivity analysis, non-linear programming, integer programming, etc. In addition, students will also learn applications of the techniques and tools and how to identify, formulate, and investigate a research problem which can be analyzed through the tools under each technical topic. Students are expected to have read both the assigned chapter and article reading before each class and be prepared to engage in the class discussion.

LEARNING OUTCOMES/OBJECTIVES

Students are expected to actively participate and contribute to the class-room discussion. The students will hand in written assignments and will be expected to have read technical chapter(s) and article(s) specified for the week. The term project consists of completing a formal literature review on a potential research topic. By the end of this course students should have a clear understanding of how to approach modeling in OR, as linear, nonlinear or integer programming; know popular optimization methods for solving these models and be familiar with applications of different models.

METHODS OF EVALUATION (subject to adjustment)

- 20% Class contribution
- 30% Assignments
- 20% Article Discussion
- 30% Report & Presentation

MATERIALS/REQUIRED READING

Hillier & Lieberman “Introduction to Operations Research” (11th Edition)

Additional material and articles will be specified well in advance of sessions where necessary.

COURSE TIMELINE AND FORMAT

(Subject to change or reorder)

| Week | Date | Topic | H&L chapter |
|------|------------------|-------------------------------------|-------------|
| 1 | Fri Jan 12, 2024 | Intro to OR, Modeling | Ch. 1, 2 |
| 2 | Fri Jan 19, 2024 | Linear Programming | Ch. 3, 4 |
| 3 | Fri Jan 26, 2024 | Duality | Ch. 5, 6 |
| 4 | Fri Feb 2, 2024 | Duality | Ch. 6 |
| 5 | Fri Feb 9, 2024 | Integer Programming | Ch. 12 |
| 6 | Fri Feb 16, 2024 | Integer Programming/Specific topics | Ch. 12 |
| 7 | Fri Feb 23, 2024 | Nonlinear Programming | Ch. 13 |
| 8 | Fri Mar 1, 2024 | Nonlinear Programming | Ch. 13 |
| 9 | Fri Mar 8, 2024 | Network Optimization | Ch. 10 |
| 10 | Fri Mar 15, 2024 | Game Theory | Ch. 15 |
| 11 | Fri Mar 22, 2024 | Lecture/Term Project Presentations | - |
| 12 | Fri Apr 5, 2024 | Term Project Presentations | - |

ENROLLMENT RESTRICTIONS

Enrollment in this course is restricted to graduate students in the Ivey PhD Program, as well as any student that has obtained special permission to enroll in this course from the course instructor as well as the Graduate Chair (or equivalent) from the student's home program.

ACADEMIC OFFENCES: PLAGIARISM AND ACADEMIC INTEGRITY

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

HEALTH AND WELLNESS SERVICES

As part of a successful graduate 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 graduate degree. See <https://www.uwo.ca/health>.

Students who are in emotional/mental distress should refer to Mental Health Support at <https://www.uwo.ca/health/psych/index.html> for a complete list of options about how to obtain help. Additionally, 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 or program coordinator.

ACCESSIBLE EDUCATION WESTERN

Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are strongly encouraged to register with [Accessible Education Western \(AEW\)](#), a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AEW and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

A FINAL WELCOME AND REQUEST OF STUDENTS

I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability, and other visible and nonvisible differences. I consider this classroom to be a place where you will be treated with respect. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. If it is appropriate to our learning and you feel comfortable doing so, I ask that you share your unique point of view as we explore the course content.