MATH*3240 Operations Research

Fall 2019
Section(s): C01

Department of Mathematics & Statistics
Credit Weight: 0.50
Version 1.00 - September 03, 2019

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1 Course Details

1.1 Calendar Description

This is a course in mathematical modelling which has applications to engineering, economics, business and logistics. Topics covered include linear programming and the simplex method, network models and the shortest path, maximum flow and minimal spanning tree problems as well as a selection of the following: non-linear programming, constrained optimization, deterministic and probabilistic dynamic programming, game theory and simulation.

Pre-Requisites:	(1 of MATH*1160, MATH*2150, MATH*2160), 0.50 credits in statistics
Co-Requisites:	MATH*2200

1.2 Timetable

MWF 12:30-1:20 in CROP SCIENCE 117

1.3 Final Exam

Wednesday Dec 4th at 8:30. Exam location is to be determined. Please see WebAdvisor for the latest information.

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2 Instructional Support

2.1 Instructional Support Team

Instructor:	Rajesh Pereira
Email:	pereirar@uoguelph.ca
Telephone:	+1-519-824-4120 x53552
Office:	MACN 519
Office Hours:	TBA. Will be announced in class and placed on courselink.

3 Learning Resources

3.1 Required Resources

A Gentle Introduction to Optimization by Guenin, Konemann and Tuncel. Cambridge University Press 2014 (Textbook)

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Construct mathematical formulations of a large class of real world problems.
2. Understand the theoretical basis of some of the key algorithms in Operations Research including the Simplex Algorithm.

4.2 B.Sc. Honours Degree

Successfully completing this course will contribute to the following:

#	Outcome	Learning Outcome
1	Problem Solving & Critical Thinking	1, 2
1.1	Critically evaluate ideas and arguments by gathering and integrating relevant information, assessing its credibility, and synthesizing evidence to formulate a position.	2
1.2	Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth and breadth of knowledge/expertise.	1, 2
1.3	Accurately interpret and use numerical information to evaluate and formulate a position.	1
2	Communication	1, 2
2.1	Accurately and effectively communicate ideas, arguments and analyses, to a range of audiences, in graphic, oral and written form.	1, 2
4	Scientific Method	1, 2
4.1	Apply scientific methods and processes by formulating questions, designing	1, 2

#	Outcome	Learning Outcome
	investigations and synthesizing data to draw conclusions and make scientifically-based decisions.	
4.2	Generate and interpret scientific data using quantitative, qualitative and analytical methodologies and techniques.	1
5	Breadth & Depth of Understanding in a Particular Scientific Discipline	1, 2
5.1	Apply the core concepts of math, physics, chemistry and biology to a chosen scientific discipline.	1, 2
5.3	Interpret current scientific concepts and gaps in knowledge (and methods) in light of the historical development of a chosen discipline.	2
6	Scientific Technology & Techniques in a Scientific Discipline	1
6.1	Apply contemporary research methods, skills and techniques to conduct independent inquiry in a chosen scientific discipline.	1

5 Teaching and Learning Activities

We will cover Chapters 1-5 and 7 of the textbook.

6 Assessments

6.1 Marking Schemes & Distributions

Assignments 20%, Two Midterms 30% (15% each), Final 50%. There will be six assignments. Midterm Dates are Thursday October 10th and Tuesday November 5th both from 5:30-6:50 with locations TBA. The locations of the two midterms will be announced in class and on the MATH 3240 Courselink webpage.

7 University Statements

7.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

7.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

7.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Graduate Calendar - Registration Changes
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml

Associate Diploma Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml

7.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

7.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be

noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website
https://www.uoguelph.ca/sas

For Ridgetown students, information can be found on the Ridgetown SAS website
https://www.ridgetownc.com/services/accessibilityservices.cfm

7.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Graduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

7.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

7.8 Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

https://www.uoguelph.ca/academics/calendars