# Math 4240 Course Outline Form: Fall 2020

**Disclaimer**
Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website

https://news.uoguelph.ca/2019-novel-coronavirus-information/

and circulated by email.

**Illness**
The University will not normally require verification of illness (doctor's notes) for Fall 2020 or Winter 2021 semester courses. However, requests for Academic Consideration may still require medical documentation as appropriate.

## General Information

**Course Title: Advanced Topics in Modeling and Optimization, Math 4240**

**Course Calendar Description:**
This course is a study of advanced topics in the areas of optimization and modeling. Topics may include continuous and discrete models together with techniques for their analysis and design, and optimization topics such as game theory, networks, nonlinear problems, Markov chains, queuing theory, agent-based models, computational intelligence based techniques and computational optimization techniques.

**Prerequisite(s):** 0.50 credits in Mathematics at the 3000 level.
**Credit Weight:** 0.5
**Academic Department (or campus):** Mathematics and Statistics
**Campus:** University of Guelph Main Campus
**Semester Offering:** Fall 2020
**Class Schedule and Location:** Lectures will be offered online in an asynchronous mode of delivery and they will be posted on CourseLink.

### Instructor Information
**Lectures' Instructor Name and office location :** Prof. Anna Lawniczak, MacN 522
**Instructors' Emails:** Prof. Anna Lawniczak, alawnicz@uoguelph.ca
**Office location and office hours:** Office hours will be held online and their schedule will be posted on CourseLink.
**GTA Information:**
**GTA Name: Harry Gaebler**
**GTA Email:** gaeblerh@uoguelph.ca

## Course Content

**Specific Learning Outcomes:** (1) demonstrate understanding of foundation of mathematical modeling and optimization, such as model formulation, techniques of model analysis and interpretation of results; (2) select, implement and interpret appropriate mathematical models; (3) discuss optimization of model performance; (4) demonstrate ability to formulate mathematical abstraction and select proper methodologies; (5) exhibit critical thinking and scientific judgement; (6) learn to read independently mathematical literature extending the material

presented in during lectures; (7) accurately and effectively communicate ideas, arguments and analyses to range of audiences in written form.

**Lecture Content:** The lecture content consists of case studies of mathematical modeling and optimization in physical, biological and engineering sciences. It will cover advanced topics in mathematical modelling, such as model formulation, techniques of model analysis, interpretation of results and some topics from optimization, e.g. continuous, cellular automata and agent-based models, some computational intelligence based techniques. All relevant resource course material will be posted on CourseLink at the time when the corresponding topic is covered. Not all course topics will be covered at the same level of depth.

**Course Assignments**: There will be 3 written term assignments. There will be the Final Take-Home assignment. The Take-Home Assignments I, II and III will be given at least one week in advance. The Final Take-Home Assignment will be given not later than Thursday, November 12, 2020.

**Course Evaluation:**
Take-Home Assignment I – 20%, due on Tuesday, October 06, 2020
Take-Home Assignment II – 20%, due on Tuesday, October 27, 2020
Take-Home Assignment III – 20%, due on Tuesday, November 17, 2020
Final Take-Home Assignment - 40%, due on Thursday, December 03, 2020

**Submission format of your take-home assignments**: Take-Home Assignment I, II, III and the Final Take-Home Assignment must be submitted as pdf files via CourseLink Dropbox.

**Course Resources**
All relevant resource course material will be posted on CourseLink at the time when the corresponding topic is covered.

**Grading Policies**
Requests for academic consideration because of illness or of a compassionate nature when an in-course requirement is missed must be made in writing and be accompanied by official certificate whenever possible. See the academic calendar for information on regulations and procedures for Academic Consideration:
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

## University Policies

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

**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 in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for Academic Consideration:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

**Drop Date:**
The last date to drop one-semester courses, without academic penalty, is ***Friday***, **December 04, 2020.** For regulations and procedures for Dropping Courses, see the Academic Calendar:
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

**Copies of out-of-class assignments:**
Keep back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

**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. More information: www.uoguelph.ca/sas

**Academic Misconduct:**
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 discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection, including, but not limited to, plagiarism detection software.
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.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

**Course Policy regarding use of electronic devices and recording of lectures:**
*Presentations which are made in relation to course work—including lectures—cannot be recorded, copied and distributed without the written permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with written permission is restricted to use for that course unless further written permission is granted. When recordings are permitted, they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor, or presenter.*

**Privacy Guide Recording of Lecture Material**:
By enrolling in a course, unless explicitly stated and brought forward to their instructor, it is assumed that students agree to the possibility of being recorded during lecture, seminar or other "live" course activities, whether delivery is in-class or online/remote.
If a student prefers not to be distinguishable during a recording, they may:

1. turn off their camera
2. mute their microphone
3. edit their name (e.g., initials only) upon entry to each session
4. use the chat function to pose questions.

Students who express to their instructor that they, or a reference to their name or person, do not wish to be recorded may discuss possible alternatives or accommodations with their instructor.

**Course Evaluation Policy:**
Please see: https://courseeval.uoguelph.ca/files/Provosts%20Protocol%20for%20teaching%20evaluations%20-%20updated%20March%202010.pdf

**Additional Course Information**

**Resources**:
The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations, which apply to undergraduate, graduate and diploma programs: https://www.uoguelph.ca/registrar/calendars/undergraduate/current/

**University Netiquette about Online Behaviour:**

**Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:**

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student
- Stating false claims about lost quiz answers or other assignment submissions
- Threatening or harassing a student or instructor online
- Discriminating against fellow students, instructors and/or TAs
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management system
- Sharing your user name and password
- Recording lectures without the permission of the instructor