University of Guelph
Department of Mathematics and Statistics
MATH 1080 – Elements of Calculus I: Fall 2019

Course Information

Instructors:

Sec.	Instructor	Office	Email	Lecture Times
01	Dr. Nagham Mohammad	MACN 513	naghamm	Tuesday, Thursday 01:00PM - 02:20PM WMEM, Room 103
02	Dr. Daniel Kraus	MACN 511	dkraus	Monday, Wednesday, Friday 09:30AM - 10:20AM ROZH, Room 101
03	Dr. Nagham Mohammad	MACN 513	naghamm	Tuesday, Thursday 10:00AM - 11:20AM ROZH, Room 104
04	Dr. Rajesh Pereira	MACN 519	pereirar	Monday, Wednesday 05:30PM - 06:50PM ROZH, Room 104

You can expect a response to emails within 48 hours Monday-Friday.

Instructors and TA Office Hours: Will be posted on CourseLink.

Textbook/Course Materials

Required textbook: Math 1080 Elements of Calculus Course Notes and Laboratory Manual, 8th. Edition.
Author: Joseph Cunsolo, Publisher: Pearson Custom Publishing, © 2015. **You are required to bring this manual to every lecture and lab session.**

CourseLink:

Course information and material (such as lab assignments, tests, etc.) will be available on CourseLink. Students are responsible to check the website regularly for updated information and announcements.

Course Description

This course provides an introduction to the calculus of one variable with emphasis on mathematical modelling in the biological sciences. The topics covered include elementary functions, sequences and series, difference equations, differential calculus and integral calculus.

Learning Outcomes:

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

- Describe the differences between sequences and series, and use formulas resulting from finite and infinite series to solve problems involving payments, deposits, dosage of drugs, and population size.

- Compute basic limits of functions and understand the importance of limits to the process of differentiation. Explain the notion of continuity as related to functions.

- Explain what a derivative is in terms of the idea of a tangent line to the graph of a function and how a derivative can be used to describe the rate of change of one quantity with respect to another.

- Understand the rules of differentiation. Learn the derivatives of the elementary functions.

- Use derivatives to explore the behaviour of a given function. And understand the information that the first and second derivatives of a function give you about that function. This includes locating and classifying its extrema, and graphing the function.

- Understand the notion of an implicitly defined function and finding linear approximations to implicit functions using "implicit differentiation.

- Understand the idea of optimisation and be able to solve extreme-value problems.

- Break down a composition of two functions into basic functions. Apply the chain rule to find derivatives of functions raised to a power, exponential functions, and logarithmic functions.

- Find intervals where a function is concave up or concave down. Find inflection points. Use the second derivative test to find local extrema.

- Calculate indefinite integrals of basic polynomial, radical, and exponential functions.

- Evaluate definite integrals to find net area between a curve and the x-axis using the Fundamental Theorem of Calculus. Use definite integrals to find the area between two curves.

Top Hat

To facilitate discussion and to enhance your learning in and out of class, we will be using educational software called *Top Hat*. *Top Hat* allows you to answer questions and engage in discussion using your smartphone, tablet or laptop. You will need to purchase the *Top Hat* app. instructions for purchasing, downloading and setting up the *Top Hat* software will be provided by e-mail.

You must attend the lecture section you are registered in to receive Top Hat **marks.** If you do not attend your registered lecture section, you will not get any Top Hat marks. **Answering** Top Hat **questions for another student is an academic offence.**

For each Top Hat question asked during class, there will be two marks: one for answering (any answer), and another for a correct response. Only the best 75% of the Top Hat marks will be used to determine your Top Hat final grade.

Note **There are no alternate dates nor make-up for missing any Top Hat questions. Dropping the lowest 25% of top hat marks is meant to take into account any absences.**

Missed Lectures:

If you miss lectures then you are responsible for finding out what you missed. Your instructor will not reteach missed material.

Out-of-Class Workload:

As in any university course much of your learning in this course will take place outside of class time. Each week you have 3 hours of lectures. Therefore you should plan to spend 3-6 hours each week in out-of-class learning. This learning consists mostly of making sure you understand the concepts and steps that were used in class to solve problems and then solving problems from the practice problems on your own.

Grading Scheme:

There are 2 grading schemes in order to minimize the impact of a poor performance on either of the 2 midterms. The scheme that gives you the best mark will be used automatically.

Scheme 1	**Scheme 2**
Top Hat Questions – 5%	Top Hat Questions – 5%
3 Lab Assignments: 15%	3 Lab Assignments: 15%
Midterm Test 1 – 20%	Best Midterm Test – 20%
Midterm Test 2 – 20%	Worst Midterm Test – 10%
Final Exam – 40%	Final Exam – 50%

Midterm Tests:

There will be 2 Midterm Tests; venues and material to be covered will be announced closer to the Midterm date.

Midterm Test 1: Friday Oct. 4th, 6:30 pm- 7:30 pm.
Midterm Test 2: Friday Nov. 8th, 6:30pm - 7:30 pm.

***Note* There are no alternate test dates nor make-up.**

Lab Assignments:

There are 3 scheduled Lab Assignments to be completed during Lab time. See the course schedule below. The Lab Assignments will be open book and you may work with others. TAs will be present to help. If you miss any of these assignments for a **valid** reason, the weight from that assignment will be carried to the final exam.

***Note* There are no alternate lab assignment dates nor make-up.**

***Note* You must attend the Lab section you are registered in to receive Lab Assignment marks. If you will write the Lab Assignments in multiple sections you will get zero.**

Final Examination:

A two hour final examination will be held on **Monday Dec. 9th, 7:00pm-9:00pm**. Please do not make any travel arrangements. Information regarding midterm tests, and final exam (e.g. material covered and locations) will be posted on the CourseLink. Students must present a valid Student ID card to write all tests and final exam.

Calculator Policy:

Regarding both term tests and the final examination, calculators are NOT ALLOWED. Additional aids are not allowed e.g. notes, books, communication or scrap paper.

Remarking of Tests:

If you have a question regarding the marking of a test you must first check the posted solutions. If you still have a question, then you should follow the procedure posted on the CourseLink. **You have 7 days to appeal a test grade.**

Missed Midterm Tests or Final Exam:

The final exam (date, time and location) is scheduled by the Registrar's Office. Students who miss the final exam due to a valid, documented reason must contact their program counsellor for advice on University regulations regarding final exams.

***Note* If** a midterm test is missed for a **valid** reason, the weight from that test will be carried to the final exam.

Learning Centre:

Drop-in help is available in the Mathematics & Statistics Learning Centre (Science Commons, 3rd floor of the library) for students seeking help with course content and/or assignments. Hours of operation are Monday/Wednesday: 9:30am - 3:30pm, Tuesday/Thursday: 10am - 4pm, Friday: 9:30am - 2:30pm. Students are expected to use the Mathematics & Statistics Learning Centre as a primary resource for help with course material.

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

University Policies

Academic Consideration

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

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. 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:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.
For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website:
http://www.uoguelph.ca/csd/

Course Evaluation Information

Please see
http://www.mathstat.uoguelph.ca/files/TeachevaluationformF10.pdf

MATH*1080 Fall 2019 Course Schedule (Tentative)

The following table gives a tentative schedule for the material covered with modules in Course Notes indicated.

Week	Topics	Notes
1. Sep. 5-6	Introduction **Module 6** Discrete Modelling -Sequences and Series	No Lab this week. Review the first 5 Modules as independent work.
2. Sep. 9-13	**Module 6** Discrete Modelling -Sequences and Series - Bounded and Unbounded Intervals, (page 1) course notes. - Basic Functions, (page 2-8) course notes. - Composite Functions, (page 31-32) course notes.	TA: Lab 4 course notes: Part B (Q4-Q7) Complete Exercise Module 6 as independent work.
3. Sep. 16-20	**Module 8** - Limits - Continuity - Difference Quotients.	TA: Lab 6 course notes: Part B (Q8-Q10). Complete Exercise Module 8 as independent work. Lab 6 course notes: Part B (Q1-Q7) as independent study.
4. Sep. 23-Sep.27	**Module 8** - Difference Quotients. **Module 7** Discrete Modelling - Difference Equations.	**TA: Lab Assignment 1** **Module 6 + Page (1-8 +31-32) + Module 8 (Limit and Continuity only)** Start Exercise Module 7 as independent work

5. Sep.30-Oct. 4	**Module 7** Discrete Modelling - Difference Equations. **Review for Midterm 1**	Midterm 1 Friday Oct. 4th **Module 6 + Page (1-8 +31-32) + Module 8 + Module 7** **Lab 4+5+6 course notes: Part B** **Exercise Module 6+7+8** Lab 5 course notes: Part B: Complete Part B as independent study. Complete Exercise Module 7 as independent work.
6. Oct. 7-11	**Module 9** - Differentiation. **Module10** - Chain Rule. - Higher Derivatives.	TA: Lab 7 course notes: Part B (Q1-Q4). Complete Exercise Module 9 as independent work.
Reading Week Oct.14-18	Fall Break Oct.14-15 No LABS **Module10** - Implicit Differentiation. - Related Rates. - Logarithmic Differentiation	TA: Lab 8 course notes: Part B (Q1-Q4). Complete Exercise Module 10 as independent work
7. Oct. 21-Oct. 25	**Module 11** - Curve Sketching - First Derivative Test - Second Derivative Test - Max-Min Problems.	TA: Lab 9 course notes: Part B (Q1-Q3). Complete Exercise Module 11 as independent work
8. Oct. 28 – Nov.1	**Module 12** - Differentials and Linear Approximation - Taylor Polynomial of Degree n.	**TA: Lab Assignment 2** **Module 9 + Module 10 + Module 11** Lab 10 course notes: Part B (Q1-Q8) as independent study. Complete Exercise Module 12 as independent work.

9. Nov. 4-8	**Module 13** - Integration **Review for Midterm 2**	Midterm 2 Friday Nov. 8th **Module 9+ Module 10 + Module 11+ Module 12** **Lab 7+8+9+10 course notes: Part B** **Exercise Module 9+10+11+12**
10. Nov. 11-15	**Module 13** - Integration **Module 14** - Definite Integrals	TA: Lab 11 course notes: Part B (Q1-Q4). Complete Exercise Module 13 as independent work
11. Nov. 18-22	**Module 14** - Definite Integrals	**TA: Lab Assignment 3** **Module 13 + Module 14** Complete Exercise Module 14 as independent work
12. Nov. 25 -29 **Thursday, *Nov. 28*** Classes rescheduled from Tuesday, October 15, Tuesday schedule in effect. **Friday, *Nov. 29*** Classes rescheduled from Monday, October 14, Monday schedule in effect.	**Module 15** - Area Between Curves. **Review for the Final Exam**	Lab 12 course notes: Part B (Q1-Q3) as independent study. Complete Exercise Module 15 as independent work