University of Guelph
Department of Mathematics and Statistics
College of Engineering and Physical Sciences
MATH*1080 – Elements of Calculus I (0.5 credit)
Fall 2024 Course Outline

Course Information

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

Method of Delivery: Face-to-Face

Meeting Information: Face-to-Face (in-person)

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.

Restriction(s):

IPS*1500, MATH*1200

Requisites:

1 of 4U Advanced Functions, 4U Advanced Functions and Calculus or equivalent - Must be completed prior to taking this course.

Required Textbook

Title: MATH*1080 Elements of Calculus Course Notes (PDF).
Author: Nagham Mohammad
Edition / Year: Third Edition

The textbook is provided on the course website in PDF format (free of charge).
You are required to bring this Course Notes to every lecture and lab session.

Calculator Policy

Regarding both **Midterm Tests and Final Exam**, only a non-programmable, non-graphical and **NOT having ($\int$ or $\frac{dy}{dx}$) calculators will be allowed**. You must have a stand-alone calculator for all tests and the final exam. You will **not** be permitted to use a calculator on a laptop computer, smartphone, etc. If you are discovered to be using anything but a stand-alone calculator during a test or the final exam, it will be reported as possible academic misconduct.

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.

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 on the CourseLink. **Answering Top Hat questions for another student is an academic offence.**

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.

For each Top Hat question asked during class, there will be two marks: one for participation (any answer), and another for a correct response. Only the best 80% of the Top Hat marks will be used to determine your Top Hat final grade since you have 3 hours of in-person class each week.

> ***Note*** **There are no alternate dates nor make-up for missing any Top Hat questions. Dropping the lowest 20% 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** or **provide** you the missed material.

Assessment Descriptions :

A brief description of each assessment is provided below. Select **Content** on the navbar to locate **Assessments** in the table of contents panel to review further details of each assessment.

Grading Scheme:

Every student is treated the same way according to the grading scheme below. We cannot modify final grades to give you an extra percent – this would be unfair to the other students. 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**.

Table 1: Grading Schemes

Scheme 1		Scheme 2	
Top Hat Questions	5%	Top Hat Questions	5%
3 Lab Assignments	15%	3 Lab Assignments	15%
Midterm Test 1	25%	Best Midterm Test	30%
Midterm Test 2	30%	Worst Midterm Test	15%
Final Exam	25%	Final Exam	35%
TOTAL	**100%**	**TOTAL**	**100%**

Midterm Tests:

- There will be two in-person (**NOT ONLINE**) 60-minute tests during this course.
- Material to be covered will be announced closer to the Midterm dates.
- Rooms of the Midterm Tests will be announced closer to the Midterm dates on the CourseLink.
- The Midterm Tests will be closed book.
- **NO formula sheet or notes will be allowed**.
- Students must present a **valid Student ID card** to write all tests.

Table 2: Tests Dates

Test 1	Friday Oct. 4th	7:00 PM to 8:00 PM
Test 2	Friday Nov. 8th	7:00 PM to 8:00 PM

***Note* There are no alternate test dates nor make-up.**
Please read the important information about missing midterm test in the "**Missed Midterm Tests"** section in this Outline.

Lab Assignments:

There are 3 scheduled Lab Assignments to be completed during Lab time. See Table 3 below. The Lab Assignments will be opened 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 **calculated from the weight of the two Midterm Tests (the 5% of missing one lab assignment will be calculated from the 55 points of the two midterms).**

***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 or different section you will get ZERO.**

Table 3: Course Assessments (Tentative)

Assessment Item	Date
Lab Assignment (1)	Thursday Sep. 26th
Lab Assignment (2)	Thursday Oct. 24th
Lab Assignment (3)	Thursday Nov. 21st

Final Exam:

A two-hour **in-person** final examination will be held on **Saturday Dec. 7th, 8:30AM-10:30AM**. Please do not make any travel arrangements for immediately after, in case inclement weather delays the exam. 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.

University of Guelph degree and associate diploma students must check WebAdvisor for their examination schedule.

https://webadvisor.uoguelph.ca

Out-of-Class Workload:

As in any university course, much of your learning in this course will take place outside of class time. 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.

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.

Teaching Assistants: Office hours with MATH*1080 Teaching Assistants will be on CourseLink. For students seeking help with course content and/or practice questions, please attend the office hours of your instructor or the TAs in person and **not through emails**.

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

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 CourseLink. **You have 3 days to appeal a test grade.**

Gradescope

Gradescope is an online testing and assessment software that may be used in this course. Visit the Gradescope website to review the Get Started videos and Student Help Centre.

https://www.gradescope.com/get_started#student-submission
https://help.gradescope.com/category/cyk4ij2dwi-student-workflow

Missed Midterm Tests:

- If you miss a midterm test due to illness or extenuating circumstances you must contact your instructor within 48 hours of the missed test.
- **There is no alternate test date for Test 1 or Test 2.**
- If you miss Test 1 or Test 2 due to illness/extenuating circumstances, the weight from that test will be carried to the **Final Exam**.

Missed 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.

Obtaining Grades and Feedback

Unofficial assessment marks will be available in the **Grades** tool of the course website. Your instructor will have grades posted online. Once your assignments/tests are marked you can view your grades on the course website by selecting **Grades** from the menu on the navbar. Your course will remain open to you for seven days following the last day of the final exam period, but the Grades will be hidden to work on the final grade of the course.

University of Guelph degree students can access their final grade by logging into WebAdvisor (using your U of G central ID). https://www.uoguelph.ca/webadvisor

---

Course Technology Requirements and Technical Support

CourseLink System Requirements

You are responsible for ensuring that your computer system meets the necessary system requirements. Use the browser check tool to ensure your browser settings are compatible and up to date. (Results will be displayed in a new browser window).

https://courselink.uoguelph.ca/d2l/systemCheck

Technical Support

If you need any assistance with the software tools or the CourseLink website, contact CourseLink Support.

CourseLink Support

University of Guelph
Day Hall, Room 211
Email: courselink@uoguelph.ca
Tel: 519-824-4120 ext. 56939
Toll-Free (CAN/USA): 1-866-275-1478

Walk-In Hours (Eastern Time):
Monday thru Friday: 8:30 am–4:30 pm

Phone/Email Hours (Eastern Time):
Monday thru Friday: 8:30 am–8:30 pm
Saturday: 10:00 am–4:00 pm
Sunday: 12:00 pm–6:00 pm

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. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration.

Drop Date

Courses that are one semester long must be dropped by the end of the last day of classes; two-semester courses must be dropped by the last day of classes in the second semester. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar.

Technical Skills

As part of your learning, you are expected to use a variety of technology:

- Manage files and folders on your computer (e.g., save, name, copy, backup, rename, delete, and check properties);
- Install software, security, and virus protection;
- Use office applications (e.g., Word, PowerPoint, Excel, or similar) to create documents;
- Be comfortable uploading and downloading saved files;
- Communicate using email (e.g., create, receive, reply, print, send, download, and open attachments);
- Navigate the CourseLink learning environment and use the essential tools, such as **Dropbox**, **Quizzes**, and **Grades** (the instructions for this are given in your course);

- Access, navigate, and search the Internet using a web browser (e.g., Firefox, Internet Explorer); and
- Perform online research using various search engines (e.g., Google) and library databases.

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. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration.

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.

University Policies

Email Communication

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

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 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 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 outlined in the Undergraduate Calendar.

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 make a booking at least 10 business days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

More information: www.uoguelph.ca/sas.

Accommodation of Religious Obligations

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements.

See the Academic calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations.

Course Evaluation Information (Student Feedback Questionnaires (SFQs))

Please see https://uoguelphca.sharepoint.com/sites/ccs/SitePages/services/course-evaluation.aspx

Plagiarism Detection Software:

Students should be aware that faculty have the right to use software to aid in the detection of plagiarism or copying and to examine students orally on submitted work. For students found guilty of academic misconduct, serious penalties, up to and including suspension or expulsion from the University can be imposed.

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.

Drop Date

Courses that are one semester long must be dropped by the end of the last day of classes; two-semester courses must be dropped by the last day of classes in the second semester. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar.

Email Communication

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

Health and Wellbeing

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness. If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources. The Student Wellness team are here to help and welcome the opportunity to connect with you.

Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

Recording of Materials

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

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.

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. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration.

Mental Health Services:

One out of every five students in Canada experiences some sort of mental health issue at some point in their academic career. If you find yourself facing a mental health crisis, or just need to talk to someone, please consider taking advantage of one of the following resources available to University of Guelph students:

Counselling Services:

Visit the Counselling Services website (https://wellness.uoguelph.ca/counselling) to get information on resources available to you, both online and in-person. You can also visit them at Health Services (J.T. Powell Building, ext. 53244) where they offer individual and group counselling sessions by appointment or walk-in.

Student Support Network: is located in the Wellness & Education Promotion Centre in the J.T. Powell Building and offers confidential, peer-based, drop-in support.

Good2Talk: (1-866-925-5454) is a free, 24/7 student hotline that provides professional counselling and referrals for mental health, addictions and well-being.

Here 24/7: (1-844-437-3247) specializes in assessment, referral and appointment booking and is available 24/7 for crisis support.

You are not alone and you will not be judged for asking for help.

MATH*1080 Fall 2024 Course Schedule (Tentative)

The following table gives a tentative schedule for the Labs and Exams dates

Week		Notes
1. Sep.5 - Sep.6	**Introduction** **Students Review- Week (O-Review) Notes** Chapter P: Preparing for Calculus I - Functions and their graphs. - Library of functions. - Operations on functions.	**NO LAB THIS WEEK**
2. Sep.9 - Sep.13	**Weeks (1 & 2) Notes** Chapter P: Preparing for Calculus II - Inverses. - Exponential and Logarithmic functions. - Sequences; summation notation; the binomial theorem.	**NO LAB THIS WEEK**
3. Sep.16 - Sep.20	**Weeks (1 & 2) Notes** Chapter P: Preparing for Calculus II - Inverses. - Exponential and Logarithmic functions. - Sequences; summation notation; the binomial theorem.	**TA: LAB (1)**
4. Sep.23 - Sep.27	**Weeks (2 & 3) Notes** Chapter 1: Limits and Continuity - Limits of Functions using Numerical and Graphical Techniques. - Limits of Functions using properties of limits. - Continuity.	**Lab Assignment (1)**
5. Sep.30 - Oct.4	**Week (4 & 5) Notes** Chapter 2: The Derivative I - Rates of Change and the Derivative. - The Derivative as a Function - The Derivative of a Polynomial function; the Derivative of $y=e^x$	**Midterm Test (1)** Friday Oct. 4th **TA: LAB (2)**
6. Oct.7 - Oct.11	**Week (5) Notes** Chapter 2: The Derivative II - Differentiating the product and the quotient of two functions; higher-order derivatives - Derivative of the Trigonometric Functions	**TA: LAB (3)**
Fall Break: Reading Week Oct.14 - Oct.18		**NO LAB THIS WEEK**
7. Oct.21 - Oct.25	**Week (6) Notes** Chapter 3: More About Derivatives I - The Chain Rule.	**Lab Assignment (2)**

8. Oct.28 - Nov.1	**Week (7) Notes** Chapter 3: More About Derivatives II - Implicit Differentiation - Derivatives of Logarithmic Functions	**TA: LAB (4)**
9. Nov. 4 - Nov. 8	**Weeks (8 & 9) Notes** Chapter 4: Applications of the Derivatives I - Related Rates - Maximum and Minimum values; Critical numbers - Local Extrema and Concavity.	**Midterm Test (2)** Friday Nov. 8th **TA: LAB (5)**
10. Nov.11- Nov.15	**Weeks (9 & 10) Notes** Chapter 4: Applications of the Derivatives II - Optimization - Antiderivatives; Differential equations **Weeks (10) Notes** Chapter 5: The Integral I - Area - The Definite Integral	**TA: LAB (6)**
11. Nov.18- Nov.22	**Weeks (11) Notes** Chapter 5: The Integral II - The Fundamental Theorem of Calculus - Properties of the Definite Integral	**Lab Assignment (3)**
12. Nov.25 - Nov.29	**Weeks (12) Notes** Chapter 5: The Integral III. - The Indefinite Integral; Method of Substitution	**TA: LAB (7)**