MATH*1200

Calculus I

Fall 2021

UNIVERSITY of GUELPH

1 INSTRUCTIONAL SUPPORT

1.1 Instructor

Mihai Nica, Ph.D.
Email: math1200@uoguelph.ca
Office hours: TBA. Office hours will be held online via Zoom.

Due to large class size, office hours are held in a group setting online. In previous years this has been a very productive and supportive learning environment. Should you require an individual, private appointment, please contact me by email to set up a meeting.

1.2 Teaching Assistants

Abby Anderson	**aander20@uoguelph.ca**	**Rocky Narang**	**rnarang@uoguelph.ca**
Michael Dube	**mdube04@uoguelph.ca**	**Amanda Saunders**	**asaunder@uoguelph.ca**
Mujtaba Elkhalifa	**elkhalif@uoguelph.ca**	**Sarah Smook**	**ssmook@uoguelph.ca**
Chong Gan	**ganc@uoguelph.ca**	**Hema Hemraj**	**hhemraj@uoguelph.ca**
Cameron Jakub	**cjakub@uoguelph.ca**	**Sofiya Makar**	**smakar@uoguelph.ca**
		Harsh Mandali	**hmandali@uoguelph.ca**

2 LEARNING RESOURCES

2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the MATH*1200 Courselink website. ***You are responsible for keeping up-to-date on this site.***

2.2 Required Resources

*MATH*1200 – Calculus I Course Notes (F21 Edition)*, available online as a PDF file on the course website. This is the primary resource for this course and functions both as a textbook, and as a notebook that we will complete together in lecture.

Since the notes have blanks which are filled in during class, you are highly encouraged to get a **printed copy of the notes** or have some method to fill them out digitially during class (e.g. a tablet)

2.3 Recommended Textbooks

In addition to the course notes, some students like to have an traditional Calculus textbook for reference. This is optional. Any edition of the classic textbook by James Stewart (Stewart, James. *Essential Calculus: Early Transcendentals*.) is a good choice. Almost any other introductory calculus textbook can also serve as a companion. There are also many good online textbooks: choose what works best for you.

2.4 Additional Resources

Past tests, supplementary questions, and other resources may be posted on the Courselink course website as needed. Again, it is important that you check regularly to keep up-to-date.

2.5 Lecture Information

There are two lecture sections:

- Lecture Section 1 (which includes LEC0101, LEC0102, LEC0103) will be held synchronously online over Zoom on Tue, Thurs 11:30AM-12:50PM
- Lecture Section 2 (which includes LEC0201, LEC0202, LEC0203) will be held in person in ROZH Room 104 on Tues, Thur 02:30PM - 03:50PM

Actively engaging in the course material during lecture is the best way to effectively learn during lectures! To support this goal, we will be using the MathMatize software for live polling during all lectures. Expect to be actively engaged and problem-solving during lecture time!

2.6 Lab Tutorial Information

The labs will serve primarily to practice problem solving with the content learned in lecture. These will happen in person during their scheduled times:

- Section 0101 and 0201: LAB Fri 04:30PM - 5:20PM, THRN Room 1200

- Section 0102 and 0202: Fri 11:30AM - 12:20PM ALEX, Room 200
- Section 0103 and 0203: LAB Fri 09:30AM - 10:20AM ROZH, Room 101

2.7 Campuswire forums and karma bonus points:

We will be using the Campuswire platform to help facilitate student questions during the term. You are highly encouraged to post questions to Campuswire and to help answer other students questions. Good questions will not just state a problem, but will include what you have tried so far and clarification on what exactly it is you don't understand. Good answers will not just provide the final answer but will explain *why* with a well justified solution.

The instructor and course TAs will identify good questions and good answers on Campuswire during the term. You can earn up to 5 Karma bonus points during the term for your participation on Campuswire by posting good questions and/or answers. Karma points increase your course grade by the following prescription: if you earned n Karma points, then those points are yours and the regular grading scheme will apply to the remaining $(100 - n)$ of your course grade. (Example: If you earned 5 Karma points, and got 60% on the rest of the course, then your final grade is 5+(100-5)60% =62%)

2.8 Communication & Email Policy

Please use office hours and Campuswire discussion forums as your main opportunity to ask math content questions about the course. Email is to be used for logistical purposes and math questions are not generally answered by email. Major announcements will be posted to the course website. **It is your responsibility to check the course website regularly.** As per university regulations, all students are also required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

If you need to contact the professor by email, you should email math1200@uoguelph.ca and expect a reply in 1-2 business days. For urgent matters, (that need to be resolved in less than 1 day) please email nicam@uoguelph.ca with the subject line "URGENT MATH1200". Emails to this email address that do not have this as the subject line may be automatically filtered into spam.

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3 ASSESSMENT

3.1 Grade Distribution

Your grade will be determined using the more favorable of the two grading schemes below. (See below for a detailed description of each category)

Grading Scheme 1	Grading Scheme 2
MathMatize Polls 5%	MathMatize Polls 0%
MathMatize Homework 10%	MathMatize Homework 10%
Lab activities 15%	Lab activities 15%

Midterms (x2) 40%	Midterms (x2) 40%
Final Exam 30%	Final Exam 35%

MathMatize Polls

MathMatize polls will be conducted in class during lecture. You receive credit for all MathMatize questions you participate in during lecture; in some questions you will get full credit for simply participating, and in other questions you will get partial credit for participating with full credit granted for also getting the correct answer.

To account for technical problems and other valid reasons you might miss a class, we will allow you to miss up to 25% of all MathMatize questions and still get a perfect MathMatize poll grade. The 25% of questions you score the lowest on will be dropped, and only your top 75% of questions will be counted towards your final grade.

MathMatize Homework

There will be homework assignments posted each week for you to complete. The content of this homework will be material covered in the previous week of classes. You have unlimited attempted to do the problems until their assigned due date. Your grade for each homework assignment will be the highest grade received from all attempts you have taken before the due date. You do not need to submit your written work for these assignments. MathMatize homework for the week will be due every Monday at 11:59pm.

Lab activities

Throughout the term there will be graded lab activities that will be carried out during your scheduled lab time. These will occur the lab class just before the midterms and final exam and will be on review content for these exams.

- Lab activity #1: Friday October 15, 2021 during lab time
- Lab activity #2: Friday November 19, 2021 during lab time
- Lab activity #3: Friday November 26, 2021 during lab time

Midterms

There will be two in person midterms for the course. They are scheduled for as follows (Note that the scheduled time block right now is a 3-hour long block from 3pm to 6pm. This gives extra time to set up for the exam and observe COVID protocols; the actual exam writing will be less than 3 hours.)

- Midterm #1: Saturday October 16, 2021 Time: 3:00pm-6:00pm
- Midterm #2: Saturday November 20, 2021 Time: 3:00pm-6:00pm

Final Exam:

The in person final exam is scheduled on:

- Final Exam: December 11, 2021 07:00pm – 09:00pm

3.2 Course Policies

COVID-19: 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. This includes scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website and circulated by email. All University-wide decisions will be posted on the COVID-19 website

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

For information on current safety protocols, follow these links:
https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.

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..exams or major assignment). Requests for Academic Consideration may still require medical documentation as appropriate.

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 number, and e-mail contact. 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

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor at the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

Missed midterm tests: Missed midterms will receive a grade of 0%, unless they are missed due to any of the above reasons, in which case the weight of the missed midterm will be added to the weight of the final exam. There will be no makeup tests or miniquizzes. Aims, Objectives & Graduate Attributes

3.3 Calendar Description

This is a theoretical course intended primarily for students who expect to pursue further studies in mathematics and its applications. Topics include inequalities and absolute value; compound angle formulas for trigonometric functions; limits and continuity using rigorous definitions; the derivative and derivative formulas (including derivatives of trigonometric, exponential and logarithmic functions); Fermat's theorem; Rolle's theorem; the mean value theorem; applications of the derivative; Riemann sums; the definite integral; the fundamental theorem of Calculus; applications of the definite integral; the mean value theorem for integrals.

Credit Weight: 0.5 **Department:** Mathematics & Statistics **Campus:** Guelph

Prerequisite: 1 of 4U Calculus and Vectors, 4U Advanced Functions and Calculus or Grade 12 Calculus

Restrictions: IPS*1500, MATH*1080

3.4 Course Aims

This course is an introductory course in Calculus. The objective of the course is to give you a strong mathematical background that you will require as you progress through your degree. The main goals of the course are (1) to teach students the Calculus concepts listed in section 4.1 at a level that promotes a deep understanding and (2) to explain how such concepts are applicable in their various degrees by exploring real-world problems.

3.5 Core Questions

The course aims to answer 3 core questions for each of the 3 main course topics: limits, derivatives and integrals. By the end of the course, students should have a robust understanding of the answers to these 9 core questions.

What is a limit?	What is a derivative?	What is an integral?
How do we calculate limits efficiently?	How do we calculate derivatives efficiently?	How do we calculate integrals efficiently?
What can we use limits for?	What can we use derivatives for?	What can we use integrals for?

3.6 Learning Objectives

At the successful completion of this course, the student will have demonstrated the ability to:

1. Evaluate, graph and know the properties of a variety of functions, including trigonometric, logarithmic, and exponential functions.
2. Establish a set of techniques for solving inequalities (perhaps involving absolute value).

3. Establish a set of techniques for treating a wide variety of limits including basic limits and indeterminate forms. Have an understanding of what a limit is calculating.
4. Prove limits using a epsilon-delta definition.
5. Understand what the derivative of a function is and how to calculate it using basic formulas, or the first-principles definition of the derivative.
6. Apply theoretical results in mathematical reasoning.
7. Calculate antiderivatives (definite and indefinite) of basic, through to complicated functions and compositions of functions.
8. Understand the Riemann sum and how it motivates the definite integral.
9. Calculate the area under a curve or between several curves.
10. Solve word problems by applying formulas and techniques learned in class.
11. Identify inadmissible solutions that arise mathematically but are not logical possibilities in a given problem.
12. Think critically about complicated mathematical problems. Question the potential subtleties of such problems and give a complete and correct answer.

3.7 Graduate Attributes

Successfully completing this course will contribute to the following CEAB Graduate Attributes:

Graduate Attribute	Learning Objectives	Assessment
1. Knowledge Base for Engineering	1-12	Homework, Exams, Labs
2. Problem Analysis	1-12	Homework Exams, Labs
3. Investigation	1-12	Homework, Exams, Labs
4. Design	-	-
5. Use of Engineering Tools	-	-
6. Communication	-	-
7. Individual and Teamwork	1-12	Labs
8. Professionalism	-	-
9. Impact of Engineering on Society and the Environment	-	-
10. Ethics and Equity	-	-
11. Environment, Society, Business, & Project Management	-	-
12. Life-Long Learning	-	-

3.8 Instructor's Role and Responsibility to Students

As your instructor, I must:

1. Develop and deliver course material in a professional way that facilitates learning for a variety of students and learning styles;
2. Respond to you. This includes, as time permits, questions in lectures, after classes, during office hours, through online forums, or through email (where I reserve the right to reply within a timeframe of 1-2 days). You are more than welcome to contact me at any time through these means if you have questions or concerns about the course or the course material.
3. Evaluate you fairly, and fairly as compared to your peers, providing prompt feedback on your performance and justification for your grade.

3.9 Students' Learning Responsibilities

As a member of this class, you are expected to:

1. Take advantage of the learning opportunities provided during lectures and in tutorials.
2. Treat others with respect and dignity whenever you address them.
3. Genuinely attempt all homework in a timely manner on your own time.
4. Seek help if you have tried the homework and are still having difficulty with the course content. This means contacting me (*not* just at the last minute!) and possibly considering other resources as I recommend them to you;
5. Notify me, as described in Section 3, in the case that there are missed tests or academic conflicts that are known in advance. If illness, work, or extra-curricular activities are causing you to struggle, you are advised to keep me up-to-date on your progress, so that I can be more helpful to you.

3.10 Online Behaviour

Inappropriate online behaviour will not be tolerated. Examples of inappropriate behavior 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 homework or completing homework for another student

• Making false claims about assignment submissions or other course content
• Threatening or harassing a student or instructor online
• Discriminating against fellow students, instructors 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

4 TEACHING AND LEARNING ACTIVITIES

4.1 Lecture Schedule

(schedule is approximate and subject to change depending on time constraints)

Lectures (Week)	Lecture Topics	References
Self-study	Review of Functions – basic functions, trigonometric functions, exponential and logarithmic functions.	A
1	What is a limit? Intuitive definition	B.1
2	What is a limit? Skills for Epsilon-Delta	B.2, B.3, B.4
3	What is a limit? Epsilon-Delta definition	B.5
4	How do we calculate limits efficiently?	B.6
5	What can we use limits for? & What is a derivative?	B.7, C.1
6	How do we calculate derivatives efficiently?	C.2
7	What can we use derivatives for?	C.3
8	What can we use derivatives for?	C.4
9	What can we use derivatives for?	C.5
10	What is an integral?	D.1
11	How do we calculate integrals efficiently?	D.2, D.3
12	What can we use integrals for?	D.4

4.2 Lab Schedule

Lab topics will correspond to weekly topics. Together we will practice the material covered in class as well as extend it to more interesting problems.

4.3 Other Important Dates

First day of MATH1200 lecture: Thursday, September 9th, 2021.
Fall Break: Monday, October 11th to Tuesday, October 12th 2021. (no classes)
Last day of classes: Thursday, December 2, 2020.

Drop Date: Courses that are one semester long must be dropped by the last day of class (**Friday, December 3, 2020)**. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar.
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Course Evaluation Information: Near the end of the term, you will be given the opportunity to evaluate your instructor and provide comments regarding your experience. The evaluations for this class will be done in-class. Your instructor will inform you of when these are to take place.

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5 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.

6 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.

6.1 Resources

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

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:
http://www.academicintegrity.uoguelph.ca/

7 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

8 Recording of Materials

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

9 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.

http://www.uoguelph.ca/registrar/calendars/index.cfm?index