MAT135H1 S: Calculus I
Summer 2021
University of Toronto

LEC5101, Tuesday 18:00-21:00 and Thursday 18:00-21:00 via Zoom.

1 Contact information

Instructor: Jamal Kawach
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Instructor office hours: Tuesday 9:30-11:30, and by appointment
TA: Leonard Afeke
TA office hours: Wednesday 9:00-10:00 and 18:00-19:00

2 Course overview

2.1 Course description

In this first introduction to Calculus, students will be introduced to the tools of differential calculus, the branch of calculus that is motivated by the problem of measuring how quantities change. Students will use these tools to solve other problems, including simplifying functions with straight lines, describing how different types of change are related, and computing maximum and minimum quantities. This course will focus on developing a deep understanding of why the tools of calculus make sense and how to apply them to the social, biological, and physical sciences. It will also emphasize translating between algebraic, graphical, numerical and verbal descriptions of each concept studied.

2.2 Prerequisites

Prerequisite: High school level calculus
Exclusion: MAT133Y1, MAT136H1, MAT137Y1, MAT157Y1, MATA30H3, MATA31H3, MATA32H3, MATA33H3, MATA35H3, MATA36H3, MATA37H3, MAT133Y5, MAT134Y5, MAT135Y5, MAT137Y5, MAT138Y5, MAT186H, MAT187H, MAT196H, MAT197H, ESC194H, ESC195H

2.3 Course objectives

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

- understand, use, and translate between multiple representations of functions, limits, and derivatives;

- solve complex and novel problems using tools from calculus;

- build a mental framework of calculus that serves as a foundation for future learning;

- see yourself as a confident and capable user and communicator of mathematics; and

- possess skills and habits for effectively learning math.

Keeping the above learning goals in mind, in this course we will address the following questions:

- Why should we represent a single relationship in different ways?

- What is infinity? What is an infinitesimal?

- How do we model the real world with mathematics?

- What is speed, and how do you measure it? What are rates, and how do you measure them?

- How can you solve novel problems that are unlike any you've encountered before?

- What do good readers and writers of math do?

2.4   Course topics

We will work through the following topics in MAT135. The corresponding sections of the textbook are indicated below; we will cover two or three sections per lecture. A precise schedule is included on the last page of the syllabus.

(1) **Modeling with functions**: How do we use mathematics to describe related quantities? §1.1-1.6

(2) **Limits**: How do we work with the infinitely small and the infinitely large? §2.1, §1.7-1.9

(3) **The derivative**: In what different ways can rates of change be represented? How are rates of change described and used? §2.2-2.6

(4) **Computing derivatives**: How are derivatives efficiently computed? §3.1-3.7

(5) **Using the derivative**: How can we use the derivative to solve complex problems from the sciences? §3.9, §4.1-4.4, §4.6

(6) **The area problem**: How is the rate of change problem related to the area problem? §5.1-5.3

2.5   Textbook and course materials

The textbook for the course is **Calculus: Single Variable, 7th edition** by Hughes-Hallett et al. It will come packaged with the homework system that we are using for the course, called WileyPlus. WileyPlus, along with the textbook, will be available from the bookstore. Do not purchase the textbook or a WileyPlus subscription from another source; you need to make sure that they link properly with the course. Please note that the bookstore offers both one- and two-semester options for WileyPlus; for this course, **you only need to purchase the one-term option**.

2.6   Course website, Zoom, and communication

All course materials, announcements, and grades will be available on Quercus at `q.utoronto.ca`. All lectures, tutorials and office hours will be held synchronously via Zoom. The Zoom links will be posted on the course website. In order to attend, you should download Zoom and create an account using your UofT email address prior to the first class. For security reasons, **you will need to use your UofT email** in order to join each Zoom session. This will also ensure that your participation grades can be assigned accurately.

   The University has a policy requiring that students have a UofT email address and that you check it regularly. Please use your UofT email address when contacting the instructor. Furthermore, please include "MAT135" in the subject line in order to ensure that your email is not missed. Please do not write to your TA; our TA hours are limited and reading/responding to emails is not part of the TA duties. You may email the instructor with math questions, but (given the difficulty in effectively communicating math over email) is it preferred that you attend office hours. Alternatively, you can post and ask/answer questions on Piazza (a link will be available on Quercus).

2.7   Lectures, tutorials, office hours

This course will consist of **two weekly three-hour lectures** and **one weekly tutorial session**. The schedule is as follows:

- LEC5101: Tuesday 6-9pm and Thursday 6-9pm.

- TUT0101: Monday 9-10am.

- TUT5101: Monday 6-7pm.

All times in this course are stated in EDT (Toronto time). All components of the course will be delivered online synchronously on Zoom. The first lecture for this course will take place on **July 6**. Lectures will be recorded and posted on the course website at the end of each week. While not strictly required, you are **strongly encouraged** to read through the relevant sections of the textbook before each lecture, as it will help maximize your understanding and increase engagement during lecture.

   Tutorials will start on **July 12** and will be held synchronously via Zoom. Students are required to attend the tutorial at the scheduled times of their registered section. Tutorials will primarily consist of problem sessions and/or review of the previous week's written quiz. Please note that we will **not make use of the Wednesday tutorial hour**; instead, TA office hours will take place at these times (Wednesdays 9-10am and 6-7pm).

   In addition to lectures and tutorials, there will be weekly office hours held by the instructor and the TA. This is an opportunity for you to ask questions about the material outside of lectures and tutorials. No appointment is necessary; you are welcome to drop in any time during an office hour. All office hours will take place via Zoom.

   The course lectures, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session. The unauthorized use of any materials provided by a MAT135

instructor or TA is covered by the Canadian Copyright Act and is prohibited. Students must obtain prior written consent to any kind of use beyond a MAT135 setting. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor.

2.8 Technical requirements

In order to participate in this course, students will be required to have:

- Reliable internet access.

- A computer satisfying the minimum technical requirements listed at `https://www.viceprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning`. At the very least, you will need to be able to run Zoom reliably on your computer.

- A method for taking pictures or scanning your written work. Any option is fine as long as your work is legible and the picture is clear.

Other recommended items include headphones, microphone, and a webcam. While it is encouraged that you turn on your webcam during lectures and tutorials, this is not required.

If you are facing financial hardship and are unable to meet these requirements, you are encouraged to contact your college or divisional registrar at `https://future.utoronto.ca/current-students/registrars` to apply for an emergency bursary so that you can obtain the required items.

3 Evaluation and assessments

As recommended by the Faculty of Arts & Science, the assessments for this online course will be more numerous, frequent and shorter in length compared to a typical on-campus course.

3.1 Mark breakdown

- Weekly homework: 15%

- In-class participation: 5%

- Multiple choice quizzes: 25%

- Written quizzes: 25%

- Final assessment: 30%

An alternate marking scheme will be implemented for students who are unable to attend lecture for valid reasons (e.g. time zone constraints). Please see below for more details.

3.2 Multiple choice quizzes

There will be **five multiple choice quizzes** focused on calculus concepts. On these quizzes, only your selected final answer will count. Your answers do not require an explanation. The multiple choice quizzes will be administered via **Quercus** each Wednesday, on July 14, July 21, July 28, August 4, and August 11. Once you begin, you will have one hour to complete the quiz. The multiple choice quizzes will be available for 30 hours, from 9am on Wednesday to 3pm on Thursday. You **are allowed** to refer to the textbook and your own personal course notes during each quiz; no other resources are permitted. You are not allowed to discuss the multiple choice quiz with anyone else until the quiz has officially closed. The lowest multiple choice grade quiz will be dropped and the remaining multiple choice quiz grades will account for 25% of your final grade. There will be no make-up multiple choice quizzes.

3.3 Written quizzes

There will be **five short written quizzes** focused on problem solving. Your solutions to these problems will be graded for both correctness and clarity. For many problems, it will not be enough to simply produce a correct final answer: you will need to show how you arrived at your answer by providing a complete solution. Likewise, you may still receive partial marks even if you do not arrive at a correct final answer but demonstrate an understanding of the key ideas or progress towards the correct answer. Not all questions will be of equal difficulty or be worth the same number of points.

The written quizzes will be administered online via Crowdmark each Wednesday, on July 14, July 21, July 28, August 4, and August 11. Once you begin, you will have one hour to complete the quiz. The quizzes will be available for 30 hours, from 9am on Wednesday to 3pm on Thursday. Your answers should be written on paper or a tablet

and will be submitted via Crowdmark. 10 additional minutes will be given to scan or take a picture of your quiz and upload to Crowdmark; this extra time is **only for scanning and uploading** your quiz. You **are allowed** to refer to the textbook and your own personal course notes during each quiz; no other resources are permitted. You are not allowed to discuss the written quiz with anyone else until the quiz has closed. Late submissions will not be accepted. The lowest written quiz grade will be dropped and the remaining written quiz grades will account for 25% of your final grade. There will be no make-up written quizzes.

3.4 Final assessment

The final assessment for the course will take place during the final assessment period for Summer 2021 (between August 18 and August 30, inclusive). The final assessment will be a slightly longer written quiz and will be administered via Crowdmark. It will account for 30% of your final grade. More details will be given closer to the final assessment period.

3.5 Homework

There will be **six weekly homework sets** assigned via WileyPlus on Quercus. Each weekly homework set will be due at 5:00pm Toronto time on Tuesdays. The homework sets will cover the current week's material and are designed to help prepare you for the following week's quizzes. You will have 5 attempts for each problem. The lowest homework grade will be dropped, and the remaining homework sets will account for 15% of your final grade. Late homework submissions will not be accepted.

3.6 In-class participation

Portions of each lecture will be devoted to working on problems in-class. During these instances, there will be opportunities to participate via **MathMatize**, a free online learning platform for calculus. Your participation will account for 5% of your final grade. Note that this is only a participation grade; the correctness of your responses will not influence your grade. In order to account for absences, if you receive a grade of 80% or higher on the participation component of the course, then your participation grade will be automatically rounded up to 100%. If you are unable to attend lectures and have a valid reason (e.g. time zone constraints), please contact the instructor; in this case, your participation grade will be moved to your final assessment grade, which will then be worth 35% of your final mark for the course.

4 Course policies

4.1 Policy on missed term work

As flexibility for missed course assignments has been built into the marking scheme, late and missed assignments will generally not be accepted. Please note that Verification of Illness forms are temporarily not required. Students who are absent from class for any reason (e.g., COVID, cold, flu and other illness or injury, family situation) and who require consideration for missed academic work should report their absence through the online absence declaration. The declaration is available on ACORN under the Profile and Settings menu.

If you miss a quiz or the final assessment and have a valid reason, then you must inform the course instructor within one week of the missed assessment. If your request is approved, you may receive an accommodation in the form of an oral exam, written make-up test, or a re-weighting of your assessments.

4.2 Email policy

Should you have a question that is not answered on the course site (please check there first!) please note that all communications with the course instructor must be sent from your official utoronto email address, with the course number included in the subject line. If these instructions are not followed, your email may not be responded to.

4.3 Online etiquette

During lectures and tutorials, please keep your computer on mute. While it might seem that no one will notice your background noise, it can be a significant distraction for the entire class. You are welcome (and encouraged) to turn your webcam on during lectures, tutorial sessions and office hours, as seeing your live reactions can be helpful for the instructor and the TA to gauge your understanding. Please be on time to class, and treat each lecture and tutorial as if you are attending it in person.

5 Institutional policies and support

5.1 Academic integrity

The MAT135 team is strongly committed to assigning grades based on our students' honest efforts to demonstrate learning in this course. Academic dishonesty in any form will thus not be tolerated in this course. All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters:
`https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019`.
If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to your course instructor. Note that you are expected to seek out additional information on academic integrity from the instructor or from other institutional resources (for example, the University of Toronto website on Academic Integrity `http://academicintegrity.utoronto.ca`). **Potential offences** include, but are not limited to:

- Having another student write a homework assignment or assessment for you, or impersonating someone else in writing one of these assessments.

- Posting course materials (including quizzes, announcements, homework, etc) online.

- Submitting questions to homework assignments or assessments online, or obtaining answers online.

- Allowing someone else to complete your WileyPlus homework problems, or completing it for someone else.

- Communicating with another person during a quiz.

- Talking to others about the content of an assessment before it has finished for all sections, including posting the content online.

- Submitting an altered quiz or assignment for re-grading.

- Violating quiz procedures.

Please note that the following actions **are not offences in this class**:

- Checking your personal class notes or textbook during an assessment.

- Discussing questions from homework with classmates and building off of each others' ideas.

- Using online resources to help you understand the content of the course or homework problems.

5.2 Copyright

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session. Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor. For questions about the recording and use of videos in which you appear, please contact your instructor.

5.3 Accessibility

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs. Students with diverse learning styles and needs are welcome in this course. If you have a disability that may require accommodations, please feel free to approach your course instructor and/or the Accessibility Services office as soon as possible. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.
Link to Accessibility Services website: `https://studentlife.utoronto.ca/department/accessibility-services`

5.4 Equity, diversity and inclusion

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. UofT does not condone discrimination or harassment against any persons or communities.

5.5 Important academic dates and deadlines

The academic dates include enrolment dates, drop deadlines, final assessment periods, petition deadlines and more. `https://www.artsci.utoronto.ca/current/dates-deadlines/academic-dates`

5.6 Other academic and personal supports

- Writing Centre: `https://writing.utoronto.ca/writing-centres/arts-and-science`

- UofT Libraries: `https://onesearch.library.utoronto.ca`

- Feeling Distressed? `https://studentlife.utoronto.ca/task/support-when-you-feel-distressed`

- Academic Success Centre: `https://studentlife.utoronto.ca/department/academic-success`

- College/Faculty Registrars: `https://future.utoronto.ca/current-students/registrars`

- Getting Ready for Online: `https://onlinelearning.utoronto.ca/getting-ready-for-online`

6 Schedule and important dates

Please see `https://www.artsci.utoronto.ca/current/dates-deadlines/academic-dates` for key dates set by the Faculty of Arts & Science, including add deadlines and holidays. Some important dates for this course include:

- First lecture: Tuesday, July 6

- Last day to switch tutorials: Sunday, July 11

- First tutorial: Monday, July 12

- Last day to drop: Monday, August 2

- Civic Holiday (no tutorials): Monday, August 2

- Last lecture: Thursday, August 12

- Last tutorial: Monday, August 16

- Study day: Tuesday, August 17

- Final assessment period: Wednesday, August 18 to Monday, August 30

The schedule for the course is as follows:

Week of	Sections	Homework	Assessments	Notes
July 5	1.1, 1.2, 1.3 1.4, 1.5, 1.6	HW1 due Jul. 13 at 5:00pm		Jul. 11: Last day to switch tutorials
July 12	2.1, 1.7, 1.8 1.9, 2.2, 2.3	HW2 due Jul. 20 at 5:00pm	WQ1 on Jul. 14-15 (Crowdmark) MCQ1 on Jul. 14-15 (Quercus)	
July 19	2.4, 2.5, 2.6 3.1, 3.2, 3.3	HW3 due Jul. 27 at 5:00pm	WQ2 on Jul. 21-22 (Crowdmark) MCQ2 on Jul. 21-22 (Quercus)	
July 26	3.4, 3.5, 3.6 3.7, 3.9	HW4 due Aug. 3 at 5:00pm	WQ3 on Jul. 28-29 (Crowdmark) MCQ3 on Jul. 28-29 (Quercus)	
August 2	4.1, 4.2, 4.3 4.4, 4.6	HW5 due Aug. 10 at 5:00pm	WQ4 on Aug. 4-5 (Crowdmark) MCQ4 on Aug. 4-5 (Quercus)	No tutorials on Monday (Civic Holiday) Aug. 2: Last day to drop
August 9	5.1, 5.2 5.3, Review	HW6 due Aug. 17 at 5:00pm	WQ5 on Aug. 11 (Crowdmark) MCQ5 on Aug. 11-12 (Quercus)	
August 16	Review (in tutorial)			
August 18-30			Final assessment	