

University of Toronto

MAT 137Y: Calculus!

2018–2019 Course Outline

Welcome to MAT137! This course has three objectives:

- (1) Calculus concepts: We want you to become fluent in various concepts in calculus (limits, derivatives, integrals, sequences, and series) and their applications to math and science. This includes learning to compute with them, and learning the most important theorems that deal with them,
- (2) Mathematical rigour: We will introduce you to mathematical logic. We want to make you comfortable with reading and understanding mathematical statements and precise definitions, and with reading, critiquing, and writing rigorous proofs.
- (3) Problem solving: In your future career, we would like you to be able to attack new problems that you have never seen before, to figure out by yourself how to adjust old methods to new situations, and to learn how to be confident with your answers. You will achieve this not by memorizing a lot of formulas and methods, but by understanding why they work and by coming up with them by yourself.

We are creating many learning opportunities in this course: office hours, videos, lectures, tutorials, practice problems, proof clinic, piazza, problem sets, and tests. Take advantage of all of them!

We wish you a productive and rewarding year, and we look forward to working with you. Thanks!

The MAT137 team:

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1. LOGISTICS

Course sites.

- The official course site is <http://uoft.me/MAT137> . You are responsible for checking it regularly. We will post on it all official announcements and course materials, including office hours, problem sets, and test information.

- We will be using quercus to post course grades.
- There is an online forum for this course on Piazza (link from the course website). This group is a resource for students to meet other MAT137 students, ask questions, discuss problems, make study groups, and in general help each other.

Textbook. The textbook for this course is a set of lecture notes written by a former MAT137 instructor:

- “*Calculus in One Dimension*” by Tyler Holden. Volumes 1 and 2. 2018 edition.

It is much cheaper than a regularly published textbook, and it is better suited for us. You may buy it at the UofT bookstore. I suggest you buy only Volume 1 for now. We will use Volume 2 in the second term.

We will indicate in the course website which sections of the textbook we are studying. Notice that the textbook sometimes may go in more depth, or provide more example, or emphasize different concepts, so it is a great source to complement videos and lectures when you are confused.

Week-by-week schedule. For our week-by-week course schedule, including list of topics, which videos to watch each week, tutorial dates, problem sets due dates, and more, see the course website. This will likely change during the terms.

Important dates.

- 19 Sep 2018 – Last date to add a course, or to add or change a lecture section or tutorial section.
- Early October 2018 – “*Change date*”: Last date to switch from MAT137 to MAT135. Notice that this is different from dropping MAT137 and adding MAT135 as separate moves (for which the deadline is 19 Sep 2018). For instructions and the exact date, see <http://uoft.me/changedate>.
- 18 Feb 2019 – Last date to drop the course without academic penalty.

Whom to contact? Our emails are listed above. For office hours, see the course website.

- For math-related questions about MAT137, you may ask any of the instructors or TAs. Visit any of us during office hours.
- For issues of academic integrity or academic misconduct, contact instructor Ivan Khatchatourian.
- For other logistical questions about MAT137, contact the course coordinator Alfonso Gracia-Saz.

- If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom, or course materials, please contact Accessibility Services: <http://www.accessibility.utoronto.ca/index.htm>
- If you have a personal situation and are concerned about how it will affect your academic performance, please contact your college registrar.

2. TALKING TO US, GETTING HELP, AND OFFICE HOURS

There are 7 instructors and 18 TAs in this course. For math-related questions, you are welcome to talk to any of us; you are not restricted only to your lecturer. For our office hours and locations, please check the course website, as they will likely change. Our emails are listed above.

You do not need an appointment to come during our regularly scheduled office hours. If you cannot make any of our office hours, ask us for an appointment by email or by talking to us at the end of a lecture. We are always happy to talk to students! **Please include “MAT137” on the subject of any email you send to us.**

We also encourage the use of piazza to ask other students for help.

The proof clinic. If you want to get extra help with proof writing, you can use the proof clinic. During the first few weeks, we will have some dedicated hours where you can bring proofs you wrote by you and a TA will give you individualized feedback on the quality of your writing. For details, see the course website.

3. WHAT WE EXPECT YOU TO KNOW BEFORE THE COURSE STARTS

One of the most common reasons for failure in calculus is a weak background in precalculus. To help you with this, our department has prepared the following website:

<http://uoft.me/precalc>

This site contains a summary of the topics we expect you to have learned in high-school. There are self-diagnostic quizzes you can take, as well as worked examples and practice problems.

We will not review this material in class. We expect you to review it by yourself and work on the practice problems by the end of the second week of class. **Ignoring this material or letting it go past the second week will make it very difficult to succeed in this course.** You may of course ask any questions to instructors or TAs during office hours. You may also use piazza to ask other students.

4. VIDEOS

We are creating short youtube videos that contain short summaries of the main concepts throughout the course. They are linked from the course website. Your instructor will tell you which videos to watch before each lecture.

We expect you to watch these videos at home before class. Coming to a lecture without having watched the corresponding videos will be a waste of time. You might as well stay at home.

5. LECTURES

There won't be a lot of actual "lecturing" on the lecture sections. We will expect you to have watched some short videos before coming, and you will spend class time working on difficult, conceptual questions and discussing them with your peers.

There are eight lecture sections. Each section meets for three weekly hours. If you are enrolled in the course, you are welcome to attend a different lecture section if you wish, as long as there are seats available.

Section	Time	Lecture Room	Instructor
L0101	MWF 9-10	MP 102	Alfonso Gracia-Saz
L0201	MWF 10-11	MP 102	Alfonso Gracia-Saz
L0301	MWF 12-1	MP 202	Boris Khesin
L0401	M 2-3, W 5-7	MP 137 (M), WB 116 (Fall W), MP 134 (Winter W)	Francisco Guevara Parra
L0501	M 4-5, W 4-6	MP 202 (Fall), MP 102 (Winter)	Jean-Baptiste Campesato
L0601	T 9-10, W 9-11	MP 202 (Fall T), MP 203 (Fall R) MP 203 (Winter)	Qin Deng
L0701	T 3-5, W 5-6	MS 3154 (Fall), MP 202 (Winter)	Ivan Khachatourian
L5201	W 6-9	MS 3154	Jeffrey Im

6. TUTORIALS

In addition to lectures, you will have one hour of tutorial per week, on Monday or Tuesday. Each week we will select a topic that is particularly important or that we know students struggle with, and you will have the opportunity during tutorial to get very useful practice and to get help from a TA in a small setting.

Notice that you need to enrol (through ACORN or through your register) both on a lecture section and on a tutorial section separately by September 19. If you need to make changes to your tutorial after this date, there will be easy instructions on the course website on how

to do the change on portal. **Please do not attend a different tutorial section without changing your tutorial section first.**

The first tutorial will be on September 17th or 18th.

7. PROBLEM SETS

The only way to learn mathematics is to practice and receive feedback. To help you with this, there will be 10 problem sets throughout the year. You will need to scan your completed problem sets (or take a picture) and submit them electronically via crowdmark. For details (including how to do this and when they are due), see the course website. The website also explains the penalty for late submission. There won't be any exceptions. Please do not ask.

We will mark your problem sets, post the grades on quercus, and return them to you electronically. The problem sets are worth collectively 10% of the course grade.

If you commit an academic offense on any single problem set, we may not accept your work and we may decide to give you no credit for any of them. Otherwise, for each student, we will only count the best 8 out of 10 grades. If you need to miss one problem set for any reason, justifiable or not, that will be one of the two grades that we will not count for you.

Practice problems. In addition to the problem sets that you will turn in, we will also post practice problems from each section of the textbook. We encourage you to work through them as we cover the sections in class. You can always visit us during office hour or use piazza for help. These practice problems won't be turned in.

On computations. We will not be including routine computational questions on your problem sets, since you do not need our feedback to become good at these. We will include them in the practice problems and in some tutorials, and certainly in tests. You are responsible for getting enough practice so that you can solve such questions on tests quickly and without error.

A note on collaboration. Discussing exercises (including graded homework problems) with your classmates is a useful and mathematically healthy practice. However, when it comes time to write up your solutions for submission, *you must work independently and present solutions in your own words*. To be certain, work together with your classmates in the discovery phase, but do not work together when you are writing your solutions, and never have the solution written by a friend in front of you when you are writing yours. In addition, do not share your problem set solutions with your peers. Doing otherwise amounts to academic misconduct, and the penalties are severe. For more information, please read the University policy on academic misconduct at <http://www.artsci.utoronto.ca/newstudents/transition/academic/plagiarism>.

Every year a significant number of the students are penalized for improper collaboration and get a record with OSAI. Whether you know it or not, whether you act like it or not, we will treat you like an adult responsible for your own actions.

8. TERM TESTS AND THE FINAL EXAM

There will be four term tests. **The dates are still tentative:**

- Test #1: Friday, 19 October 2018, 4-6pm.
- Test #2: Friday, 30 November 2018, 4-6pm.
- Test #3: Thursday, 7 February 2019, 6-8pm.
- Test #4: Friday, 22 March 2018, 4-6pm.

We will confirm the dates on the course website once they are definite. We will also post detailed information on each test on the course site three weeks before it takes place.

If you have an academic conflict for one of the tests (for example, a tutorial or a lab for a different course), then we will offer you an alternative time. For this, you will need to let us know at least one week before the date of the test. We will post more information on the course site.

If you are unable to write any of the term tests for a legitimate reason (e.g. severe illness), we will accommodate you, but you must notify us as soon as it is possible (if at all possible in the next 24 hours after the test, but certainly no more than a week after the test), and you will have to provide us with appropriate documentation. We will post more information on the course site. For some tests, the accommodation consists of a make-up test; for others, the weight of the test is distributed among the other three term tests. You do not get to choose. We will inform you of the details once you are approved.

There will be a three-hour cumulative final exam during the April 2019 exam period. The exact date and time will be posted by the Faculty of Arts and Science.

We do not permit the use of any type of calculator during term tests or the final exam.

9. MARKING SCHEME

Your course mark will be

$$10\% \cdot PS + 50\% \cdot F + 12\% \cdot T_A + 10\% \cdot T_B + 10\% \cdot T_C + 8\% \cdot T_D$$

or

$$10\% \cdot PS + 35\% \cdot F + 18\% \cdot T_A + 15\% \cdot T_B + 12\% \cdot T_C + 10\% \cdot T_D$$

whichever is higher. In the formulas above:

- PS may be 0 if you have committed an academic offense. Otherwise, it is the average of your best 8 out of the 10 problem set marks.
- F is your final exam mark.
- T_A is the grade in your best term test.
- T_B is the grade in your second best term test.
- T_C is the grade in your third best term test.
- T_D is the grade in your worst term test.

10. ADJUSTEMENTS, BORDERLINE GRADES, AND “CURVING”

We understand that sometimes things happen (you may have a bad day, you may have multiple tests in a row, perhaps a particular test is a bit easier or a bit harder). That is why we have a generous grading scheme with automatic “adjustment” procedures built into it: we drop the lowest two problem set scores, your best term test counts for more and your worse counts for less, and the final exam is worth more or less depending on how you do in it. This is a way to soften any blow and allow you to recuperate easily from a bad day.

We try to evaluate you in absolute, not relative standards. Your grade should reflect the quality of your work against the learning objectives of the course, not how well you do relative to your peers. If you all do well, there will be a lot more As than usual. If you all do poorly, there will be a lot more Fs than usual. A passing grade in MAT137 should mean that you have a chance of surviving in MAT237, not that you are in a certain percentile of the class. We will not adjust grades just because students do well or bad. So do not ask for any additional adjustments: there will be none.

Finally, a word of caution: beware of using the phrase “curving grades”. Most students think that “curving grades” means “adjusting grades”. It doesn’t. One of the main objectives of MAT137 is to use mathematical concepts precisely and carefully. “Curving grades”, in this context, is a mathematical concept. Any student that misuses this term in lecture, tutorials, piazza, or emails deserves to fail the course.