Math 1560 Course Outline

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Abstract

As you embark upon your study of calculus in this course (Math 1560), you likely have many questions, such as: "What is Calculus, anyway?" and "Is this on the test?"

This year provides even more uncertainty. How is online differernt from in person? What if I get sick? I'll try to answer those questions and more in this syllabus.

1 Introduction to Math 1560

Welcome to Math 1560, Calculus I. I'm glad you've chosen to embark on this journey through a mathematical classic. The Fall 2021 offering of this course will be an adventure, as I attempt to offer simulataneously online and in person.

Let's get one thing out of the way before we begin: Calculus I isn't nearly as bad as its reputation might suggest. Most students who put in the work do well in Math 1560. (In Fall 2020, more than half the class earned an A grade.) We will do our best to support you in your learning, and ensure that students continue to do well in this course.

There are many of us in this class, coming from many different backgrounds and situations. I want our classroom to be an inclusive space for all students. If the "default settings" for the class don't work for you, please don't hesitate to ask for accommodation. Not everyone has reliable high speed internet. Not everyone is able to attend scheduled classes without work/family/life getting in the way. But everyone deserves a fulfilling, enjoyable learning experience in each class.

We begin with some introductions: to the university, to the staff, and to the course.

1.1 Welcome to the University of Lethbridge

Oki, and welcome to the University of Lethbridge. Our University's Blackfoot name is Iniskim, meaning Sacred Buffalo Stone. The University of Lethbridge acknowledges and deeply appreciates the Siksikaitsitapii peoples' connection to their traditional territory. We, as people living and benefiting from Blackfoot Confederacy traditional territory, honour the traditions of people who have cared for this land since time immemorial. We recognize the diverse population of Aboriginal peoples who attend the University of Lethbridge and the contributions these Aboriginal peoples have made in shaping and strengthening the University community in the past, present, and in the future.

For most of you, this is your first semester at the University of Lethbridge, or at any post-secondary institution. University is an exciting time. You'll be

exposed to new people, new ideas, and new experiences. The return to campus will make it easier for some to connect with classmates, but not all, so we will continue to provide opportunities for group work.

Most of your courses, including this one, will be facilitated using the Moodle learning management system. You'll want to spend time as soon as you can familiarizing yourself with your course Moodle pages, and plan to check each one on a daily basis.

Transitioning to learning in the university environment is a challenge at the best of times. Doing so while a pandemic refuses to go away will be additionally challenging. Everyone here at U of L will be doing our best to help you through this time.

Don't hesitate to reach out if you have questions. I'll do my best to answer all of your course-related questions as quickly as possible. (See Section 3 for details on how to get in touch.) If you have questions that are not related to the course, you can ask those too, and I'll try to answer, or to direct you to someone who can.

There's some great general advice for first year students on the U of L website, including links to Academic Advising and advice on study skills from the Student Success Centre. Other resources can be found on the University's Health and Safety website.

1.2 Course staff and contact information

Math 1560 is running in three sections for Fall 2020: A, B, and C. My name is Sean Fitzpatrick. I'm in charge of sections A and B. Section A is online, while Section B meets in person. I can be reached via email at sean.fitzpatrick@uleth.ca.

Math 1560C will be taught by Milad Fakhari.

We have several people teaching tutorials this semester. (This information may change.)

- Shirin Alimirzaei will be teaching sections 1 and 6.
- Elchin Hasanalizade will be teaching sections 2 and 3.
- Neal Jackett will be teaching sections 4, 5, and 7.
- Sean Legge will be teaching sections 8, 9, 10, and 11.

Student hours: you are not going to get everything you need during class time. I will be available throughout the week for consultation, either one-on-one, or in small groups. Monday through Thursday, you can book appointments with either myself or Milad, using Calendly. You'll find the links for booking appointments on Moodle. Any appointment can be in person, or over Zoom — just indicate your preference when booking. Friday I will have drop-in student hours: 9:30 – 11:30 am in my office. For students in Math 1560A, I will do my best to start each Zoom meeting 30 minutes early, at 5:30 pm.

1.3 Course description

This is Math 1560, Calculus I. It's a first course in calculus, covering limits, derivatives, and integrals of functions of one variable.

We'll be dealing with all your favourite functions from high school: polynomials, logarithms, exponentials, even trigonometric functions.

- **Limits** tell us about the value of a function near a point. A limit is simulataneously approximate and precise. In fact, most of calculus could be described as "the art of precise approximation"
- **Derivatives** tell us about how a function is *changing* near a point. Most rates of change in the sciences, from speed to population growth, are quantified using derivatives.
- **Integrals** will be defined in the context of calclating area, but they also appear whenever aggregates or averages are being considered.

Both derivatives and intergrals are defined using limits, and the two are related in a (possibly) surprising way.

1.4 Online instruction and COVID policies

This time, only one section is online, but we should be prepared to go remote at any time, either individually (if you have symptoms or have been exposed to COVID), or as a class (if the 4th wave continues to get out of control). Note that it is likely there will be times when a class has to be taught online because the instructor is unavailable. We are likewise not allowed to come to campus if unwell. I may also have to teach from home because one of my kids is sick and has to quarantine.

I will do my best to ensure that the course experience is as similar as possible for all students, including those enrolled in the online section.

Our COVID policies will be as follows:

- Masks are required for all in-person interactions, as per university policy. If you cannot wear a mask, I would be happy to have you join us in the online section. This rule is non-negotiable. If a student attending in person refuses to wear a mask, our options are to either cancel class, or remove the offending student from the classroom.
- If you are at all ill, you must stay home. I will make arrangements for any in-class work to be done remotely.
- If an instructor for an in-person lecture or tutorial has symptoms, but is well enough to teach, that class will be temporarily moved online. A Zoom link will be posted to Moodle should this occur.
- I have two children in elementary school who cannot yet be vaccinated. There is a good chance that at some point I will have to move a class online because I have to stay home with them. I will give you as much notice as possible if this happens, and do my best to minimize distruption.

Both online and in person, you should expect:

- More emphasis on:
    - Conceptual understanding
    - Discussion
    - Context (the whole "what is this good for?" routine)
    - Being generally swell human beings
- Less emphasis on:
    - Memorization (because how am I gonna stop you from looking stuff up, anyway?)

- Routine computational proficiency (let's be honest: the computer can do this better than us most of the time)
- Tests and exams (so I can spend more time teaching and less time as the Math Police)

The course is set up with synchronous meetings (in person, or via Zoom) as scheduled in the timetable. It's great if you can come to these. There will be opportinuties for discussion, and to work on problems (including ones you'll be handing in) with your classmates.

It's also understandable if you can't. Bad internet. Illness. Bosses who don't understand that online classes still have, well, classes. Maybe you have to share your computer with your little brother. Maybe travel restrictions mean that when class meets, it's 2 am where you are.

I'll do my best to also support asynchronous learning as needed. Lots can be done on your own time, even if you do make it to class. The textbook is free, online, and full of videos. We'll run an online Q&A forum you can use to ask questions any time of day. Tests ***are not*** during class time. You'll have a 24 hour window.

In Subsection 2.4 you're going to see that there are lots of pieces to your grade. And yes, most of them have deadlines. But don't worry! Most of those pieces are small: designed to be done in class, or to take up no more than an hour or so of your time. Learning any kind of math is a marathon, not a sprint. So I'm giving you a little bit to do every day. Keep at it, and you'll do well.

2 Essential course information

This section covers essential course information, including the meeting times, textbook, and grading scheme.

2.1 Course website

The primary course website is Moodle. On Moodle, you can expect to find:

1. Links to important resources, like this syllabus, and the textbook.
2. Links to key course activities, including the online homework, and the discussion forum. (The links will log you into those services automatically.)
3. Details about your grades and assessments.
4. A weekly topics schedule.

The weekly topics schedules will be key to staying on top of your course material. Every week you can expect to receive details on readings, videos, homework, and assessments, as well as information on what will be taking place in class, and how to access those classes.

In case there's a day when Moodle isn't working properly and you need access to course materials, you can find some of them (like this syllabus) on my personal website. The textbook for this course (and many others) is available on our Open Textbook Server.

2.2 Scheduled classes

Math 1560 will be taught using a blend of synchronous and asynchronous instruction. Asynchronous components are explained in later sections. We have maintained the originally scheduled class meeting times, which are as follows:

Math 1560A Monday and Wednesday, 6:00 - 7:15 pm.

Math 1560B Tuesday and Thursday, 9:00 - 10:15 am.

Math 1560C Tuesday and Thursday, 4:30 - 5:45 pm

Note that Math 1560C will be taught by a different instructor. Students enrolled in Math 1560A who would prefer to attend in person are welcome to do so. But please let me know: we will be doing work in groups, and I want to keep those groups consistent if possible. Students enrolled in Math 1560B who are unable to attend in person, whether due to illness or any other reason, are welcome to attend online. Again, please let me know in advance.

There is also a weekly *tutorial*. Tutorials take place on Thursday and Friday. Once we know who the instructors are, I will add information on Moodle.

Classes will be a mixture of Q&A (where I do examples by request) and group work (Math 1560A will use Zoom's **breakout room** feature). Sometimes I will provide a problem for discussion that you will work on as a group, and then we'll reconvene as a class to compare group responses. You will also have time in class to work on group assignments, and after each test there will be a group test that takes place in class.

For the Q&A portion:

- You can use the discussion forum to recommend problems for us to discuss. (See Section 3.)
- Once we choose a question to solve, I'll give the class an opportunity for input on how to solve it.
- I will record my solution (based on your input) and upload later to YouTube. Recording will be done so that only my video is captured. (That is: if you all want to turn on your cameras so I can see your smiling/frowning faces, I promise not to record you and put it on YouTube.)

Tutorials will be synchronous, and facilitated by a tutorial instructor. You will use tutorials to work on the basic computational skills essential to success in calculus. Work in tutorial will be done in groups, and graded for feedback.

If you can't attend tutorial synchronously, please let me know. You will be able to submit your work for tutorial remotely. This year, to make sure you do not feel pressured to attend when sick, you will be able to submit individually, or with a group. Students who miss tutorial will be able to use Campuswire to connect with others working on the assignment.

2.3 Course textbook

Our course textbook is APEX Calculus, by Greg Hartman. This book is an **open education resource** (OER). That means that the book is fully free, both in terms of cost, your freedom to use and share the book however you see fit.

If getting the book for free somehow feels wrong, or you worry you're missing out by not buying anything, here are two great books you can buy:

1. Mathematics for Human Flourishing, by Francis Su
2. Change is the Only Constant, by Ben Orlin

Neither of these books are in any way needed for the course. But they're cool books, and they're about math. (The second is even about Calculus!) So if you feel like you need to spend money on a book, you can. (Or I don't know, go to the library or something.)

About APEX: For the last few years, I've been working with Greg and others to convert the textbook to a system called PreTeXt. The PreTeXt language allows us to write a book that can be produced in a variety of formats.

There is a PDF version (the original format of the book), which will be available on Moodle. The PDF version is useful if you want to print the book, or simply want to be able to read when there is no access to internet.

The real advantage of PreTeXt is that we can output to HTML format. The HTML version of the textbook can be found at `https://opentext.uleth.ca/apex-standard/part-calculus-I.html`. This version of the book can be read on both desktop and mobile web browsers. It also contains a number of nice features, including embedded videos, interactive graphics, and annotation tools.

YouTube: `https://www.youtube.com/watch?v=wELGr5mUNt4`

2.4 Grading scheme

Traditionally Math 1560 has been a mostly skills-focused course: the focus was on learning how to compute limits and derivatives, and the tests mostly checked your proficiency in these skills. This doesn't work well online, when most routine calculations can be done easily on the computer! Our assessment principles this year:

- No big high stakes assessments: lots of little ones instead.
- More concepts, and less rote computation. (Less — not none. Your follow-on courses will still assume you know how to take a derivative.)
- Classes (the synchronous part) will be used for work, not lecture. (Nobody wants to sit though a 75 minute Zoom lecture on Calculus, including your instructor.)
- Group work is good for you. (Even if you don't always like it!)

The various graded components of the course are explained below. At first it will seem like there's a lot to do! But most items are small, and many can be done during class time.

Tutorials (10%) Every tutorial will involve an assignment to be completed. You will be encouraged to work on these problems (and submit) in groups. Evaluation will be strictly *formative*: you will receive feedback on the work that you submit, and a grade of 1 or 2.

A grade of 2 indicates that you have done the work correctly, or that any errors are minor, and don't indicate misunderstanding. A grade of 1 indicates that you've made mistakes that need to be corrected. We will do our best to return your feedback prior to the next tutorial. If you received a grade of 1, you will then have an opportunity to submit corrections. This can be done on paper, or during office hours. Successful submission of corrections will increase your grade from 1 to 2.

Online Homework (15%) The homework, like tutorial, will focus on building fluency with the computational procedures of calculus. You can expect a new problem set every week. Homework will be delivered through the **WeBWorK** online homework system. See Subsection 4.1 for details.

Assignments (15%) Assignments will be done in groups, and there will be time set aside in each class to work on them. Each assignment have only one or two problems, but these will typically involve multiple steps, and you will be graded as much on the quality of your explanation as on the validity of your mathematics.

Typically a written assignment is expected, but interested students are encouraged to explore alternative formats. For example, if a group wants to submit a video presentation instead of written work, that sounds like fun, and I will totally be on board with that.

Here is a fictitious (but possibly informative) grading rubric for assignments:

- A: wow, they clearly discussed this as a group, and nailed down all the key points! I also appreciate how the work is legible and relatively free of frustrated scribbling.
- B: everyone had something to say, but I'm not sure they all agreed. There's an obvious mistake that someone should have caught, suggesting that nobody thought to read it over before submitting.
- C: most of the details are there but this was clearly done in the last hour before the deadline. Also, it looks suspiciously like one person did all the work.
- D: looks like parts (a), (b), (c), and (d) were each done by a different person, and then arranged randomly on the page.
- F: nothing submitted. Or work is a crude drawing of what appears to be an integral attacking a kitten.

Tests (60%) Each of the five chapters will conclude with a test. The test will be open book. There will be a time limit, but you will have some flexibility in terms of when you choose to begin. Details on test dates can be found in Section 7.

The following grading notes apply. Each test is worth a total of 15 points.

1. *Pre-test workshop (3 points).*

   Prior to each test you will be assigned a few study questions, which you will answer on Moodle. You will then give anonymous feedback on the responses from some of your peers. Most reasonable efforts will receive full credit.

2. *Individual test (7 points).*

   You will write the test *individually*, and submit via **Crowdmark**. Tests will be completed remotely for both sections.

3. *Group test (3 points).*

   After the individual test, there will be a follow-up *group test*. This will take place in class, except for groups who have elected for a fully asynchronous format.

4. *Exam wrapper (2 points).*

   After your test has been graded, you will be asked to submit a short reflection piece, where you comment on your performance and the feedback you receive.

   Typically, you will be asked to comment on the following:

   (a) What did you do to prepare for the test?

   (b) What types of mistakes did you make on the test?

   (c) What (if anything) could you do differently next time?

5. There are five tests in total. I will automatically take your best 4 out of 5 test scores. That way you can miss a test (or have a bad day) without affecting your grade.

   Notice that the individual portion of the test (i.e. "the test") is only worth just under half the total test grade. So you can tank the test and still pass the test, if that makes sense. (But if you've done the pre-test activity I bet you won't tank it.)

   Note that the group test is scheduled to take place in class. I will be working to identify students for whom this would be a hardship. Those of you who legitimately cannot attend (you know, for reasons) will be grouped together and given an alternative activity.

Each of the grade components above will be assigned a numerical score. These will be added to get a score out of 100. Your score out of 100 is converted into a letter grade according to the following table.

Table 2.1 Conversion of percentage scores to letter grades in Math 1560

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	F
98-100	93-97	90-92	86-89	80-85	76-79	72-75	65-71	62-64	58-61	50-57	0-49

A note on deadlines: many deadlines are flexible, and provided primarily for your benefit, to help with planning. (A course without deadlines can be a disaster for those who procrastinate.) One exception is the workshop activity before each test. Because we can't begin the peer review portion of the workshop until the submission deadline passes, we have to have a deadline for the activity to proceed.

3 Communication

The following communication channels are available in this course:

1. *Forums.*

   There will be a primary course Q&A forum using Campuswire. To sign up, follow this link, and enter the PIN code 2781. You will need to use your U of L email address for this. If you do not want to use your U of L email, I can send you an invite to a different address.

   (a) Students can choose to remain anonymous (to their peers) when asking a question.

(b) You can set up chat rooms, either public or private, dedicated to specific topics.

(c) You can create a *live room* with support for video chat.

The Campuswire forum should be your primary communication channel. In particular, any questions about homework and course content should be asked on Piazza, since I can reply there with mathematical notation. You will also get a much faster reply on the forum than you will from email.

There is one exception: in our WeBWorK online homework system, there is an "Email Instructor" button you can click to send feedback. This is useful if you think there's an error in the question, or if you've tried it several times and can't figure out why you're wrong. See Subsection 4.1 for details.

2. *Email.*

   You can email me for questions that aren't related to course content. For example, if you have to miss class, or a test, you can email me to let me know.

4 Technology elements

To facilitate online teaching, our course will rely on several technological solutions. This section provides details on navigating the technology.

4.1 Online homework

Online homework is delivered via WeBWorK. WeBWorK is an open source homework system that I maintain on a local server. This service is provided to you free of charge, and your data never leaves campus. [1]

The value of WeBWorK is that questions are automatically graded, providing you with immediate feedback on your work. This is an excellent source of guided practice.

YouTube: `https://www.youtube.com/watch?v=79kRzUV7f2U`

To access WeBWorK: simply click the relevant link in Moodle. You will be signed in automatically — there is no user name or password. But keep in mind that if your session times out due to inactivity, you have to return to Moodle to log in again.

Submitting answers: WeBWorK has an automatic preview feature. The mathematics in your answer will be rendered as you type. (You can turn this off in the user settings if you don't like it.) If everything looks good, click the Submit button. The system will immediately respond with "Correct" or

[1] Okay, this is not entirely true. Since faculty sometimes work from home, your data does travel from campus to my house via the university VPN.

"Incorrect". If your answer is correct, there is nothing more to do: your answer has been recorded, and you have credit for that problem. If your answer is incorrect, you get to try again. (*Exception*: I typically do not give unlimited attempts for true/false and multiple choice questions.)

Other notes:

- Some questions are "scaffolded" — there are multiple parts, and you need to complete one part before being allowed to access the next. For these, you want to click the Preview Answers button, rather than Submit, to check your work and move on to the next step.
- If you need to include scientific units in an answer, the automatic equation rendering can cause trouble. There's a little tool bar on the right hand side that lets you switch to *text mode* to enter units.
- At the bottom of each page is an "Email Instructor" button. If you are stuck on a problem, or if you think there is an error in the programming (it happens!) you can use this to let me know. WeBWorK will send me an email with your message, along with a link to the exact version of the problem you were working on. Often I can figure out where you're going wrong by looking at your answer.

  Please *do not* use the email button to ask me how to solve a problem. That's what the discussion forum is for. It should only be used afer you've made several attempts at the problem, or if you see an error message of some sort.

Finally, some general advice: WeBWorK is not a new addition for the online environment. I've used it for awhile. The students who do well in this course are the ones who start their problem sets early. Please do not wait until the due date to begin: it leaves you no time to ask questions! The most effective way to use WeBWorK is to read the relevant portion of the textbook, try the problems, and then ask for help on the ones you're stuck on.

Oh, and please do not wait until you've made 50 unsuccessful attempts at a problem to ask for help. If you haven't figured out a question after 5 or 6 attempts, set it aside, and come back to it a bit later. If you still can't figure it out, go the discussion forum.

4.2 Crowdmark

Tests and assignments will be submitted through Crowdmark. For *in person* assessments, you will sometimes be able to complete work on a paper worksheet. This worksheet will be scanned and uploaded to Crowdmark by your instructor. Other assessments will be done remotely, and you will be respnsible for uploading the work yourself. Like WeBWorK, Crowdmark is connected to Moodle, so you just have to click a link in Moodle to access your assessement and submit your work. Unlike WeBWorK, Crowdmark lets you do your work using pencil and paper. For ease of reference, I've placed advice for using Crowdmark on a separate page.

Basic advice:

- Start each question on a clean sheet of paper.
- Use a scanner, or a scanning app on your smartphone. PDF is best, but JPG and PNG files are also supported.
- When you submit, make sure your pages are in order, and rotated correctly.

4.3 Zoom

Online classes and tutorials will meet using Zoom, which is the officially supported meeting app for U of L classes. Note that students also have access to Microsoft Teams, if they need access to videoconference software outside of class.

We will *not* use Zoom exclusively for "content delivery". This is the job of the textbook and the prerecorded videos. Those videos are embedded into the textbook, so you can watch them as you read. Alternatively, you can subscribe to my channel on YouTube.

I may choose to record some parts of our classes on Zoom. Any time I record, you will receive a warning (in case you want to turn off your camera, perhaps). Note that Zoom does not record breakout rooms. Typically, I will only record when I am presenting the solution to a problem. Those recordings will then be posted on Moodle for later access.

List 4.1 Zoom guidelines and etiquette

- Sign on using your U of L email and your proper name. I'm hoping to be able to put you into "breakout rooms" using pre-assigned groups. This will not work if your name doesn't match what's on the class list.
- You ***do not*** need to have your camera on at all times. But do consider adding a profile photo or avatar, so I don't have to spend class looking at a grid of black rectangles.
- Please ***do*** mute your microphone when everyone is together in the main room. You can unmute if you want to ask a question.
- Please ***don't*** mute your microphone while in a breakout room. (With reasonable exceptions: some of you might be in noisy environments, such as a construction site, or a house with kids.)

List 4.2 Asking questions during class

1. Using the chat box in Zoom. This is probably most useful to quickly ask for clarification on something I just said.
2. Using the discussion forum. I'll monitor this during class. This will let you ask more detailed questions than the Zoom chat. (For example, if you want to ask about a particular homework question.)
3. Using your voice! There is a "raise hand" feature if you don't want to interrupt, but it's often perfectly reasonable to interrupt, especially if you notice me getting something wrong!

Group work in Zoom. During most Zoom sessions, you will be put into smaller breakout rooms to work on problems. Breakout rooms are not recorded, and I cannot actively monitor the breakout rooms — these are essentially private working sessions for your group. I *do* have the ability to join a breakout room temporarily, but will only do so when invited. If you need my help during a breakout session, there is an "Ask for help" button you can use to get my attention.

You will be encouraged to use Microsoft OneNote to collaborate with your group. OneNote lets you type notes, insert photos, and use handwriting, if you have a touch-enabled device. Unlike the Zoom chat and whiteboard features, your OneNote notebook will remain available after class for you to refer to. See Subsection 4.4 for more details.

Recording. First of all: I do not intend to record entire Zoom meetings. I will record myself if I'm doing an example or solving a problem someone has requested, and post those recordings online for later reference. I have things set up so that I only record myself, with recording anyone else. This should let us avoid any privacy concerns.

Please be aware that it is an ***academic offence*** to record a class, or anyone in it, without prior authorization. If all members of a breakout room agree to having someone record your discussion, this is fine. When are in the "main room" of Zoom, recording is not permitted.

4.4 Using OneNote

OneNote will be used both for class presentations, and for student collaboration. Details here will include how to access class notebooks, how to edit collaboratively, how to print, etc..

Students will have access to OneNote through their Office 365 accounts. There were early promises of Moodle integration that don't seem to have worked out. What we got instead are class "teams" on Microsoft Teams. There's one team per section, and each team has a class notebook attached to it.

5 Course policies (an FAQ)

This section deals with questions about accommodations, missed tests, and other exceptional (yet common) cases.

1. *Do I need to wear a mask?*

   Yes, whenever you are on campus. This is university policy. It is also a basic courtesy you can extend to your classmates. If you are unable to wear a mask, you are welcome to attend the online section. As a parent of two kids who cannot yet be vaccinated, I appreciate your willingness to take any steps you can to protect those around you.

2. *I don't think I can attend the classes regularly. Can I still take the course?*

   Short answer: yes. I recognize that not all students have access to the same technology. If your home internet is unreliable, attending Zoom sessions could be a challenge. If you can't attend synchronous sessions, I will arrange alternatives for graded work done asynchronously. I will also try to connect you with other students in the same situation, so that you still have a group you can work with.

3. *What happens if I get sick?*

   First and foremost, do not come to class! I'll do my best to be accommodating of any illness that interrupts your studies. There is no need to provide details of the illness. If you miss a week or more of work, please get in touch to make a plan for catching up. One of the biggest

challenges in math is that once you fall behind, it's difficult to catch up on your own.

4. *What exactly does academic honesty mean?*

   In short, that any work you represent as your own, is your own. Much of your work can be done in groups, but not all of it. I will assume that you have access to a calculator, including online software (like Symbolab) that give you step-by-step solutions.

   Use of these tools is acceptable, but take care that you are not overly reliant on them. What is not acceptable is having someone else do your work for you. This includes tutors, classmates, friends, family members, and online "homework help" sites. If you submit work that somebody else did for you, you are committing an academic offence.

   Penalties for academic dishonesty are outlined in the Academic Calendar. Depending on the severity of the offence, penalties for a first offence can range from a grade of zero on an assessment, to an F in the courses. Academic offences are also reported to the Dean of Arts & Sciences. They keep a record of each offence, and students with multiple offences can be subject to supplementary discipline.

5. *Does that mean I'm not allowed to get help with my homework?*

   Not at all! But keep in mind that your course instructors will be available for help, free of charge. (OK, maybe not free of charge, but you've already paid for it with your tuition.) We will be responding on the discussion forum regularly, There will be time to ask questions in every class, and there will be online office hours. The Student Success Centre will also be running free help sessions (details TBA).

   Some of you may still decide to pay for tutoring, and that's fine. But you have a duty to disclose sources of help on an assignment, and the individual tests are still tests, even if you won't have someone watching over your shoulder.

   You should probably avoid the various paid "homework help" websites. Most of these don't offer help. They offer worked solutions for a price. Getting those solutions won't help with your understanding. More importantly, the people working for these sites are paid (poorly) per solution, and they often provide incorrect and/or badly written work. (We saw plenty of examples of this last Spring, and yes, all those students now have discipline reports on file.)

6. *I missed a test! What do I do? Do I get a zero?*

   First, contact me as soon as possible for any missed test. There are *five* tests, and I only count *four* towards your grade. As long as you only miss one test, there is no penalty. This is true regardless of your reason for missing the test.

7. *What if I really wanted to write that test?*

   Inform me of this when you contact me to explain your absence. There's no guarantee that I can schedule a makeup test, but I'll try. You're more likely to get a makeup test if you've contacted me in advance.

8. *Do I need a doctor's note?*

   No. This wastes health care resources and your time. (That was my answer before the pandemic, and it's doubly so now.) Just email me to

say you were sick. However, if you miss more than one test due to illness, we'll need to meet to discuss how to adjust your grade.

9. *I receive learning accommodations. What arrangements can I make?*

   First, make sure that you have registered with the University's Accommodated Learning Centre. No need to let me know: they notify me of every student with accommodations.

   Some accommodations will look a bit different this year, but exam accommodations such as extra time are still possible.

   If there are any adjustments I can make to facilitate your learning, please do not hesitate to get in touch with me. All students deserve an equal opportunity to learn. Note that the HTML textbook is designed with accessibility in mind, and should work with screen readers. However, I regret that we have not had the time (or paid help) necessary to add elements such as alt-text descriptions for images. It's on the to-do list, but that list is long, and growing.

10. *Life intervened and I can't keep up this week. What do I do?*

    Send me an email. Extensions are usually granted as long as they're granted ahead of time. Online homework extensions need to be in place before solutions become available. Book an appointment with me as soon as you feel like you're falling behind and I'll do my best to get you up to speed.

6 Learning outcomes for Math 1560

This page outlines the list of competencies each student is expected to achieve in Math 1560. There are five "big themes," corresponding to the five chapters of the textbook. (The number following each outcome below indicates the corresponding textbook section.) The online homework, tutorial assignments, and tests are all designed to help you achieve these outcomes.

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

Chapter 1: Limits and continuity

1) Explain the concept of a limit using graphical and numerical information. (1.1)
2) Apply limit laws in an abstract setting (explicit functions not given). (1.3)
3) Use algebraic (or trigonometric) manipulation to evaluate limits. (1.3)
4) Algebraically and graphically determine one-sided limits of piecewise-defined functions. (1.4)
5) Understand the meaning of continuity, both precisely and intuitively. (1.6)
6) Understand and apply the **Intermediate Value Theorem**. (1.6)
7) Evaluate limits involving infinity and determine asymptotic behaviour of a function. (1.5)

Chapter 2: Derivatives

1) Understand and apply the limit definition of the derivative. (2.1)

2) Understand the practical meaning of the derivative in terms of rates of change. (2.2)
3) Understand and apply derivative rules (sum, constant, power, product, quotient). (2.3, 2.4)
4) Calculate derivatives using the chain rule. (2.5)
5) Understand and apply implicit and logarithmic differentiation. (2.6)
6) Understand inverse functions and their derivatives. (2.7)

Chapter 3: Graphical behaviour of functions

1) Determine maximum and minimum values of a continuous function on a closed interval. (3.1)
2) Understand the significance of the **Mean Value Theorem**. (3.2)
3) Understand the relationship between the first derivative and the shape of a graph. (3.3)
4) Use the second derivative to determine concavity, and understand its significance. (3.4)
5) Produce an accurate sketch of the graph of a function without the use of technology. (3.5)

Chapter 4: Applications of the derivative

1) Solve word problems involving related rates of change. (4.2)
2) Solve word problems involving optimization. (4.3)
3) Use linear approximations to estimate function values. (4.4)
4) Compute the Taylor polynomial of a function to a specified degree. (4.5)
5) Understand the practical significance of differential calculus.

Chapter 5: Integration

1) Compute antiderivatives and solve initial value problems. (5.1)
2) Understand and apply properties of definite integrals. (5.2)
3) Understand the Riemann sum definition of the integral, and use it to approximate an integral. (5.3)
4) Use Part I of the FTC to compute derivatives of functions defined as integrals. (5.4)
5) Use Part II of the FTC to evaluate simple definite integrals. (5.4)
6) Use the method of substitution to evaluate definite and indefinite integrals. (6.1)
7) Set up and evaluate a definite integral to compute area between curves. (5.4)

7 Course schedule

I will attempt to follow the schedule below, bearing in mind that some adjustments are always needed, and this is probably more likely as we attempt to navigate an online environment. Numbers below refer to textbook sections.

Every class will have some time for Q&A, and for discussion. Wednesday classes will have time dedicated to group work. Depending on the week, this

group work could be the group portion of a test, or time to work on one of the assignments.

Online homework assignments will be due Tuesday. Tests will open Thursdays at 6 pm (after Math 1560C meets) and close Fridays at midnight. Students who cannot write on Friday can request to have their test moved to the weekend. The group test will take place in the class immediately after the individual test. On weeks without a test, you will have a group assignment, which is typically done in class.

Because different sections of the course are on different days this term, scheduling of content and assessments is a bit more complicated. Below is an outline of scheduled topics; details on assessments (including due dates) will be made available through Moodle.

Table 7.1 Schedule for Fall 2021

Monday (Math 1560A)	Tuesday (Math 1560B/C)	Wednesday (Math 1560A)	Thursday (Math 1560B/C)	Notes
		Sept. 8 Intro	Sept. 9 Intro	Welcome!
Sept. 13 1.1 and 1.3	Sept. 14 1.1 and 1.3	Sept. 15 1.4	Sept. 16 1.4	Group Assignment 1
Sept. 20 1.5	Sept. 21 1.5	Sept. 22 1.6	Sept. 23 1.6	Test 1
Sept. 27 2.1-2.3	Sept. 28 2.1-2.3	Sept. 29 2.4	Sept. 30 No class	Truth and Reconciliation Day
Oct. 4 2.5	Oct. 5 2.4	Oct. 6 2.6	Oct. 7 2.5	Group Assignment 2
Oct. 11 No class	Oct. 12 2.6	Oct. 13 2.7	Oct. 14 2.7	Thanksgiving Monday Test 2
Oct. 18 3.1	Oct. 19 3.1	Oct. 20 3.2	Oct. 21 3.2	Group Assignment 3
Oct. 25 3.3 and 3.4	Oct. 26 3.3 and 3.4	Oct. 27 3.5	Oct. 28 3.5	Test 3
Nov. 1 4.2	Nov. 2 4.2	Nov. 3 4.3	Nov. 4 4.3	Group Assignment 4
November 8 – 12: Reading Week (no classes)				
Nov. 15 4.4	Nov. 16 4.4	Nov. 17 4.5	Nov. 18 4.5	Test 4
Nov. 22 5.1	Nov. 23 5.1	Nov. 24 5.2	Nov. 25 5.2	Group Assignment 5
Nov. 29 5.3	Nov. 30 5.3	Dec. 1 5.4	Dec. 2 5.4	Test 5
Dec. 6 5.4 and 6.1	Dec. 7 5.4 and 6.1	Dec. 8 No class		