

Syllabus - Math 1 Fall 2021

1 Course Description

This course is an introduction to single variable calculus for students who have not taken calculus before. Students who have seen some calculus, but not enough to place out of Math 3, should take Math 3. Math 1 reviews relevant techniques from algebra and pre-calculus, covers the manipulation and analysis of functions, including polynomial, trigonometric, logarithmic, and exponential functions, an introduction to convergence and limits, continuity, rates of change and derivatives, differentiation rules, and applications to approximation. Students wishing to continue their study of calculus after Math 1 may take Math 3.

2 Textbook

Calculus Volume 1 by OpenStax (ISBN: 978-1-947172-13-5). This textbook is available for free online at <https://openstax.org/details/books/calculus-volume-1>.

Calculus Volume 2 by OpenStax (ISBN: 978-1-947172-14-2). This textbook is available for free online at <https://openstax.org/details/books/calculus-volume-2>

3 Lectures

Section 1 (McCombs)
(10) MWF 10:10am - 11:15am
(10X) Th 12:15pm - 1:05pm

Section 2 (Green)
(11) MWF 11:30am - 12:35pm
(11X) Tu 12:15pm - 1:05pm

Section 3 (Fan)
(12) MWF 12:50pm - 1:55pm
(12X) Tu 1:20pm - 2:10pm

Section 4 (Duque-Rosero)
(2) MWF 2:10pm - 3:15pm
(2X) Th 1:20pm - 2:10pm

4 Instructors

Kameron McCombs (he/him/his)
Kameron.T.McCombs.GR@dartmouth.edu

Dylan Green (he/him/his)
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Steve Fan (he/him/his)
Steve.Fan.GR@dartmouth.edu

Juanita Duque-Rosero (she/her/hers)
Juanita.Duque.Rosero.GR@dartmouth.edu

5 Office Hours

Students from any section can attend any office hours.

McCombs	MWF 11:30-12:30pm (or by appointment)	Green	MWF 9:30-10:30am (or by appointment)
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Fan	MWF 10:30-11:30am (or by appointment)	Duque-Rosero	MWF 12:30-1:30pm (or by appointment)
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6 Homework Policy

Homework in this class will be online and will consist of the following. Calculators are allowed on all homework:

- (3 times/week) WebWork that is due before 4pm, one week after the lecture. So after a Monday class, WebWork will be posted that day and will be due before 4pm on the following Monday.
- (1 time/week) Written homework which you are encouraged to collaborate on. You must submit your own solutions. Opens at 4pm on Wednesday and due at 4pm on the following Wednesday.
- Late homework will not be accepted. The lowest homework grade will be dropped.
- Do not hesitate to talk to your professor if something comes up and you miss (or expect to miss) multiple homework assignments.

7 Grading

The course grade will be based upon the scores on the homework, quizzes, midterm exams, and the final exam as follows:

- Written Homework: 15%
- WebWork: 10%
- Quizzes: 15%
- Midterms: $2 \times 18\%$
- Final: 24%

The lowest homework and lowest quiz grade will be dropped. This grading policy is subject to change, but grades will not decrease as a result of changes.

8 Submission and Late Policy

There will no doubt be technical issues. Please feel free to contact the instructors with any concerns. For assignments you upload:

- Try to upload your file.
- Clarity and neatness and vital workplace skills, so it is important that your problems are clearly delineated and we can recognize which work corresponds to which problem. The simplest way to ensure this is by doing your problems on separate pages and uploading them individually; however, an organized individual may be able to put all their work on a single sheet without creating ambiguity. **If we as instructors cannot find a problem because of the disorder of your submission, we may deduct 50% of the value of that problem.**
- Associate each problem in the assignment to the page on which it occurs. If you do not associate a problem to the page it occurs on, we won't be able to grade it properly. **You automatically lose 25% of the value for any assignment where you fail to associate your pages to their respective problems.**
- Check that your uploaded file opens correctly. If it doesn't open for you, it won't open when it is being graded! **If you are still having problems**, send an email to your instructor before the assignment is due. Include the file you are trying to upload.
- If there are outstanding circumstances, contact your instructor as soon as possible to find a way to resolve the issue.

9 The Honor Principle

Academic integrity is at the core of our mission as mathematicians and educators, and we take it very seriously. We also believe in working and learning together.

Collaboration on homework is permitted and encouraged, but obviously it is a violation of the honor code for someone to provide the answers for you.

On written homework, you are encouraged to work together, and you may get help from others, but you must write up the answers yourself. If you are part of a group of students that produces an answer to a problem, you cannot then copy that group answer. You must write up the answer individually, in your own words.

On exams and quizzes, you may not give or receive help from anyone. Exams and quizzes in this course are closed book, and no notes, calculators or other electronic devices are permitted.

10 Tutorials

The TA for this course is Jay Chen. Tutorial assistance for this course and help with your homework will be available Tuesday, Thursday, and Sunday evenings 7-9pm. Tutorial times are subject to change to allow more students to participate.

11 Attendance

You are expected to attend class in person unless you have made alternative arrangements due to illness, medical reasons, or the need to isolate due to COVID-19. For the health and safety of our class community, please: do not attend class when you are sick, nor when you have been instructed by Student Health Services to stay home. Please arrange with your professor how to catch up on any course material that you miss.

12 Safety

In accordance with current College policy, all members of the Dartmouth community are required to wear a suitable face covering when indoors, regardless of vaccination status. This includes our classroom and other course-related locations, such as labs, studios, and office hours. If you need to take a quick drink during class, please dip your mask briefly for each sip. Eating is never permitted in the classroom. (The only exception to the mask requirement is for students with an approved disability-related accommodation; see below.) If you do not have an accommodation and refuse to comply with masking or other safety protocols, I am obligated to assure that the Covid health and safety standards are followed, and you will be asked to leave the classroom. You remain subject to course attendance policies, and dismissal from class will result in an unexcused absence. If you refuse to comply with masking or other safety protocols, and to ensure the health and safety of our community, I am obligated to report you to the Dean's office for disciplinary action under the Guarini School's Standards of Conduct. Additional COVID-19 protocols may emerge. Pay attention to emails from the senior administrators at the College.

13 Accommodations

Students requesting disability-related accommodations and services for this course are required to register with Student Accessibility Services (SAS; Getting Started with SAS webpage; student.accessibility.services@dartmouth.edu; 1-603-646-9900) and to request that an accommodation email be sent to me in advance of the need for an accommodation. Then, students should schedule a follow-up meeting with me to determine relevant details such as what role SAS or its Testing Center may play in accommodation implementation. This process works best for everyone when completed as early in the quarter as possible. If students have questions about whether they are eligible for accommodations or have concerns about the implementation of their accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.

14 Special Considerations

The academic environment at Dartmouth is challenging, our terms are intensive, and classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including your undergraduate dean (<http://www.dartmouth.edu/~upperde/>), Counseling and Human Development (<http://www.dartmouth.edu/~chd/>), and the Student Wellness Center (<http://www.dartmouth.edu/~healthed/>).

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with your instructor before the end of the second week of the term to discuss appropriate accommodations.

15 Title IX

At Dartmouth, we value integrity, responsibility, and respect for the rights and interests of others, all central to our Principles of Community. We are dedicated to establishing and maintaining a safe and inclusive campus where all have equal access to the educational and employment opportunities Dartmouth offers. We strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community. The Sexual Respect Website (<https://sexual-respect.dartmouth.edu>) at Dartmouth provides a wealth of information on your rights with regard to sexual respect and resources that are available to all in our community.

Please note that, as a faculty member, I am obligated to share disclosures regarding conduct under Title IX with Dartmouth's Title IX Coordinator. Confidential resources are also available, and include licensed medical or counseling professionals (e.g., a licensed psychologist), staff members of organizations recognized as rape crisis centers under state law (such as WISE), and ordained clergy (see https://dartgo.org/titleix_resources).

Should you have any questions, please feel free to contact Dartmouth's Title IX Coordinator. Their contact information can be found on the sexual respect website at: <https://sexual-respect.dartmouth.edu>.

16 Tentative Course Outline

The following is a tentative outline for the course. This page will be updated irregularly. Please refer to the Canvas page for updated assignments, and recorded lectures for up to date material.

Week	Lecture	Sections in Text	Brief Description	Practice Problems
1	9/13	1.1	Functions and Graphs	1.1: 1, 3, 7, 11, 13, 23, 25
	9/15	1.1	Operations on Functions; Even and Odd Functions	1.1: 29, 33, 37, 39, 43
	9/17	1.2	Library of Functions	1.2: 75, 81, 87, 89, 101
	X-hour		Review session	
2	9/20	1.2, 2.1	Average Rate of Change; Constructing a Function Which Describes a Model	1.1: 55; 1.2: 67, 73, 103, 107
	9/22	1.2	Transformations of Functions	1.2: 83, 89, 91, 93
	9/24	1.3	Trigonometric Functions	1.3: 123, 125, 133, 155
	X-hour		Quiz 1	
	9/27	1.4	Inverse Functions	1.4: 185, 187, 191, 199, 207
3	9/29	1.5	Exponential and Logarithmic Functions	1.5: 231, 235, 239, 249, 267, 285
	10/1	Vol. 2, 5.1	Sequences	Vol. 2 5.1: 1, 3, 11
	X-hour		Quiz 2	
	10/4	Vol. 2, 5.1	Limit of a Sequence	Vol. 2 5.1: 23, 25
	10/6	Vol. 2, 5.1	Bounded and Convergent Sequences	Vol. 2 5.1: 33
4	10/7		Midterm 1	
	10/8	2.3	Limit of a Function	2.2: 39, 43, 47, 61
	X-Hour		Cancelled because of midterm	
	10/11	2.3	Limit Laws	2.3: 83, 87, 93, 107, 115
	10/13	2.4	Continuity	2.4: 131, 133, 155
5	10/15	2.3, 2.4	Continuity; Intermediate Value Theorem; Squeeze Theorem	2.4: 161, 163, 167
	X-hour		Quiz 3	
	10/18	3.1	Defining the Derivative	3.1: 1, 3, 11
	10/20	3.2	The Derivative as a Function	3.1: 35, 47, 49; 3.2: 55, 59, 85
6	10/22		Limits, Continuity, and Differentiability	3.2: 75, 79, 87
	X-hour		Quiz 4	
	10/25	3.3	Basic Rules for Derivatives	3.3: 107, 109, 111
	10/27	3.3	Product and Quotient Rules	3.3: 111, 113, 123, 127
7	10/28		Midterm 2	
	10/29	3.5	Derivatives of Trig Functions	3.5: 175, 179, 181
	X-hour		Cancelled because of midterm	
	11/1	3.6	The Chain Rule	3.6: 215, 221, 223, 229, 235
8	11/3	3.8	Implicit Differentiation	3.8: 301, 307, 319, 329
	11/5	3.9	Derivatives of Log Functions	3.9: 331, 333, 335, 343
	X-hour		Quiz 5	
	11/8	3.7	Derivatives of Inverse Functions	3.7: 265, 269, 289
9	11/10	4.3	Maxima and Minima	4.3: 90, 96, 108, 130
	11/12	4.8	L'Hôpital's Rule	3.8: 356, 362, 372, 388
	11/15	Everything	Review for Final Exam	
	X-hour		Quiz 6	
	11/19-11/23		Final Exam	