

MATH D001A 13 Calculus

Fall 2023

Syllabus

Class Modality:

This class meets in-person on Tuesdays and Thursdays, 11:00-1:15 in Room S-16.

Course Description:

This course covers the fundamentals of differential calculus. Specifically, the course includes the basic concepts of analytic geometry, limits, derivatives, and their applications. The topics covered will include graphs and derivatives of algebraic, trigonometric, exponential, logarithmic, and hyperbolic functions. Applications, such as motion, differentials, related rates, graphing, and optimization, will be covered. There will be a greater focus on mathematical rigor than is often present in precalculus courses, with extra emphasis on definitions, precise notation and logic.

Student Learning Outcomes:

Upon successful completion of the course, students will be able to:

- Analyze and synthesize the concepts of limits, continuity, and differentiation from a graphical, numerical, analytical and verbal approach, using correct notation and mathematical precision
 - Evaluate the behavior of graphs in the context of limits, continuity and differentiability
 - Recognize, diagnose, and decide on the appropriate method for solving applied real world problems in optimization, related rates and numerical approximation
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Course Content:

- Introduction to limits, definition of limits, theorems on limits, one-sided limits, computation of limits using numerical, graphical, and algebraic approaches, delta-epsilon definition of limit
- Continuity and differentiability of functions, determining if a function is continuous and differentiable at a real number
- Limits involving infinity and asymptotes
- Introduction to derivatives, and the limit definition of the derivative at a real number and as a function
- Use of differentiation theorems, derivatives of algebraic, trigonometric, inverse trigonometric, exponential, logarithmic, and hyperbolic functions, the chain rule, implicit differentiation, differentiation of inverse functions, higher order derivatives
- Use of derivatives for applications including equation of tangent lines, related rates, differentials, and Newton's Method

- Local/relative and global/absolute extrema of functions
 - Rolle's theorem and the Mean Value Theorem
 - The first derivative test, the second derivative test and concavity
 - Graphing functions using first and second derivatives, concavity, and asymptotes
 - Applications of extrema including optimization
 - Indeterminate forms, and L'Hopital's Rule
 - Antiderivatives
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Expectations:

- **Communication:** I expect you to check your email and log into Canvas every day. I will send occasional reminders or make announcements this way, and I don't want you to miss them. Feel free to contact me via email (bambhaniadoli@fhda.edu) or via Canvas message outside of class with any issues related to the class. You do not have to wait until the next class meeting. You can expect a response within 24 hours on weekdays and within 48 hours on the weekend. If you don't get a reply back to your email, try Canvas message, and the vice versa.
- **Attendance and Engagement:** I expect you to attend each class and be fully engaged with the class throughout the quarter. I will look for your participation during class, during office hours, and through the submission of assignments. Be sure to submit all first week and second week assignments to get into the "rhythm" of the class. **Please note that if you're not attending class and/or not submitting the assignments during the first two weeks of class, I will assume that you are not interested in the taking the class and may drop you!** Please note that **participation is part of your grade**. Also note that there is a Questions Discussion Board set up for you to ask and answer questions to your classmates. Each entry is worth 1 extra credit (provided you follow the guidelines). You can get up to 5 extra credit points for the quarter this way.
- **Feedback:** Any feedback on your discussions, problem sets, quizzes and exams will be provided as either annotation/comment in Canvas or on paper. If you need additional feedback regarding grading (especially automatically graded items such as homework), please email/message me directly about that assessment. I will aim to grade all items within a few days of submission, but you can expect most assignments and assessments to be graded within 1 week of submission.

If, for any reason, you stop participating and intend to drop the class, please do an official drop in a timely manner. If you fail to do so, you will receive an 'F' in the class. Follow the deadlines for this class in My Portal. I do not have the ability to make exceptions to these.

Covid Information:

Since this is an in-person class, please familiarize yourself with Covid-related protocols for De Anza College.

- Covid-19 Information: <https://www.deanza.edu/healthservices/covid-19.html>

Please note:

- Masks covering the mouth and the nose are recommended but not required for this class.
- If you become infected with Covid during the quarter, you must fill out the Student Self-Reporting Form at <https://www.deanza.edu/covid/student-form.html>

Textbook and Calculator:

Great news: your textbook for this class is available for **free** online!

[Calculus, Volume 1 from OpenStax](#) ISBN 1-947172-13-1

You have some options to obtain this book:

- [View online](#)
- [Download a PDF](#)

You can use whichever formats you want. Web view is recommended -- the responsive design works seamlessly on any device.

You will need a scientific calculator for this class. You will be allowed to use only a scientific calculator on quizzes and exams.

Prepared Lecture Notes:

I have put together prepared lecture notes designed to help you keep your lecture contents organized. Here is the file: [Math 1A Prepared Notes \(1stEdition\).pdf](#). Please print the the file, or open it on a tablet if you have the ability to annotate PDF files electronically. When you attend class, you are expected to take notes on these. Keep all your notes organized in a binder. I strongly recommend that you do this. If you don't have access to a printer or a tablet, you may purchase them at the bookstore (about \$20).

Weekly Schedule:

- **Tuesdays:** During Tuesday meetings, after going over announcements and student questions, we will take a quiz or an exam (see calendar). After that, we will cover new content. Be sure to bring a scientific calculator and your prepared lecture notes.
- **Thursdays:** Thursday meeting will primarily be dedicated to going over new material. Be sure to bring your prepared lecture notes.
- **All days:** Read the textbook, work on homework and problem sets, respond to discussion boards, and study!

Office Hours:

- Monday, Tuesday: 10-10:50 a.m.: In office (S-43A) and on Zoom (<https://fhda-edu.zoom.us/j/84346215419>)
- Wednesday, Thursday: 1:30-2:20 p.m.: In PST Village Room (S-55) and on Zoom (<https://fhda-edu.zoom.us/j/87244312907>)
- Or, by appointment (Send me a Canvas message or email to set up)

Homework and Problem Sets

The best way to succeed in any math class is to do all of the assigned work correctly and in a timely manner, making sure you really understand what you are doing! Focus on how to think mathematically about problems, not just on following a procedure and getting the right answer! Time spent on the homework and problem sets will directly benefit you on quizzes and exams.

Online Homework: You will have online homework for each section we cover. The homework uses the free software MyOpenMath, and will be graded for correctness. The links and due dates are within the Canvas Modules, but generally speaking, the Online Homework is due twice a week. You will have 5 late passes, each of which will give you a 24-hour extension on the homework for a particular section with 5% penalty. You may ask me questions on the online HW by using the 'Message Instructor' button.

Problem Sets: Each week, we will have a problem set that you will work on. These problems will be posted as a PDF in the Canvas modules. You are to work them out on paper neatly. These sets include problem-solving and critical-thinking exercises that rely on your conceptual understanding of the material and related skills.

Problem Sets Submission Guidelines:

- *Write out the problems neatly on **separate paper**, or on a blank tablet file. There is not enough room on the Problem Set PDF.*
- *You are encouraged to discuss the problems with your classmates, but you must write up your own solutions independently. **Never** copy anyone's work for any reason!*
- *Do the problems in **order**, showing all work neatly, clearly and completely.*
- *Label each problem clearly – use a **highlighter** to mark the number, or put a **box** around it so it's easy to find. You don't need to write the question, just fully-worked out solutions.*
- *Don't squeeze a lot of work into a small amount of space. Leave some white space around your solutions for brief comments.*
- *Write your solutions out in full detail, as modeled in the textbook and in lectures. You should also draw well-labeled and appropriately scaled diagrams and graphs when relevant.*
- *Submit the Problem Set on paper in class. Alternatively, you may submit it as a **single PDF document** on Canvas. Use a scanning app such as Genius Scan. Your scanned copy must be **legible** and have **correct orientation**.*
- *Problem sets are **due** on **Tuesdays** at the **start of class**, about 11 a.m. You can have a 24-hour **extension** with 10% penalty.*

Discussions:

Throughout the quarter, there will be several Canvas discussions. These are worth points, so be sure to complete them. When grading your post, I will look for your engagement with the discussion topic through how well you articulate your thoughts (you won't be graded for spelling and grammar, though you should check them). In case of topics where you are asked to post an example of a type of problem, your response must be original. If you draw significant inspiration from elsewhere, you must cite your source (include the link); otherwise, it's plagiarism. Discussion entries will typically be due on Sundays at 11:59pm.

Quizzes:

We will have **eight** 20-minute, in-person quizzes (see the calendar at the bottom of this page). These will have problems similar to your online homework and problem sets. The quizzes will take place during the first half of the class on Tuesdays.

IMPORTANT: Generally speaking, there will be NO MAKEUPS for any of the quizzes, and your lowest quiz score will be dropped. If you're dealing with an unexpected issue, you're welcome to reach out to me. I will see what I can do to help.

Exams:

We will have **two** midterm exams, and a cumulative final exam. All of the exams are proctored and in-class. See the calendar for the dates.

IMPORTANT: There will be NO MAKEUPS for any of the exams.

NOTE: In case of an unforeseen emergency or illness due to which you cannot take an exam, please get in touch with me immediately, and I can work with you to find a solution. If this happens for the final exam, that may result in an 'Incomplete', provided that you supply me with a sufficient proof.

Evaluation:

Your final grade will be computed as follows:

Point Values of Assignments and Assessments

Category		Points
Homework	27 @ 5 points each	135
Problem Sets	11 @ 10 points each	110
Discussions	Top 6 @ 5 points each	30
Participation		20
Quizzes	Top 7 @ 15 points each	105
Exams	2 @ 75 points each	150
Final Exam		100
TOTAL		650

Letter Grade based on Overall Percentage

Overall percentage	Your grade will be at least
97% or greater	A+
92% to less than 97%	A
90% to less than 92%	A-
87% to less than 90%	B+
82% to less than 87%	B
80% to less than 82%	B-
75% to less than 80%	C+
70% to less than 75%	C
55% to less than 70%	D
less than 55%	F

Help:

1. Your classmates are a great resource. Ask for help and provide help to others. You may use the Questions Discussion Board (worth extra credit)!
2. Message me through Canvas with questions or attend office hours. For online homework questions, message me by using 'Message Instructor' button in the problem.
3. Ask questions during class.
4. Get help from De Anza's Math Student Success Center. See details at <http://deanza.edu/studentsuccess/> Use NetTutor for 24-hour chat-based help through Canvas.
5. If you need any technical help with MyPortal, Canvas, etc., visit <https://www.deanza.edu/quarter-guide/#Learning>
6. Find links to services with some specific to this time, such as for help with tech equipment, food and financial assistance, health services, resources for undocumented students, etc at <https://www.deanza.edu/services/>

Academic Integrity:

All students are expected to exercise academic integrity throughout the term. Any instances of cheating or plagiarism will result in disciplinary action, including at minimum, 0 on the assignment or assessment, but may include recommendation for dismissal. You are encouraged to work together on homework but simply copying down from someone else's work is wrong! Cheating on a quiz or an exam is more serious. It will certainly result in getting a 0 on the assessment, but could result in getting an 'F' in the course or dismissal from the class. Also, each incident of cheating will be reported to the Dean of the Physical Science, Mathematics and Engineering Division and the Office of Student Development. Please see the De Anza College's page on Academic Integrity: https://www.deanza.edu/policies/academic_integrity.html. Check out this video produced by De Anza College on this topic: <https://www.youtube.com/watch?v=4unoOe-I0eY>

A note about Discord: I encourage you to ask and answer questions amongst yourselves in order to strengthen your understanding of topics in this class using platforms such as Canvas discussion boards and Discord. However, be careful that you don't compromise your academic integrity or entice others to compromise theirs! For example, never answer a classmate's question about a homework problem by providing a complete, fully

worked out solution! There are at least two reasons for this: 1) It would create too much of a temptation to copy - not necessarily for the original question poster but for other classmates; and 2) Your solution could be incorrect, in which case you would be hindering the class' understanding of the involved concepts and skills. It goes without saying that you should also never discuss anything during a quiz or an exam on Discord or any medium, even after the quiz/exam has been submitted. Some students may have a special accommodation (due to disability, for example) that allows them to have a later submission time. Discussing solutions before their exam is due would compromise the integrity of their submission.

Disability Notice:

If you feel that you may need an accommodation based on the impact of a disability, please contact me privately to discuss your specific needs. Also, please contact Disability Support Programs & Services through <https://www.deanza.edu/dsps/> for information or questions about eligibility, services and accommodations for physical, psychological or learning disabilities.

Tips for Success:

In any math class, and especially this one, your goal should be to get **ownership** of the material. This means that not only you understand the concepts, and can demonstrate the skills, but also that you can explain them to someone who doesn't have them. The material covered in this class is essential for the next courses in the series. This is not a "learn and forget" class; rather, it's a "learn well so you can succeed going forward" class.

Here are my recommendations for succeeding in this class in the online setting:

1. **Dedicate some time to the class every day!** Do some work related to the class every day. Check for upcoming deadlines and make sure you are aware of them.
2. **Stay on schedule.** Stick to the schedule on the calendar. Don't fall behind! Be disciplined about this to stay on top of the class. Take careful notes in the prepared lecture notes, and catch up quickly if you must miss a class. Writing aids memory so you are more likely to retain the material you watched. The quarter passes by faster than expected – especially if you're new to the quarter system – and it's almost impossible to catch up, so plan accordingly.
3. **Be fully present during class.** Allowing yourself to occasionally miss class, or multi-task during class, is a slippery slope. It can easily turn into a bad habit that can cost you the grade you want in this class.
4. **Come to class prepared and ready to contribute!** Be sure to have reviewed previous class' material and attempted online HW before you come to the next class.
5. **Invite productive struggle.** To succeed in any STEM class, you must **do your work diligently**. I am aware that there are many sources that can provide you the answers and even the worked solutions. However, **productive struggle** is essential in learning and retaining the material, and in gaining the confidence in your problem-solving ability. You must sweat through the problems, especially the ones that challenge you.
6. **Form a study group.** Exchange your contact information with at least 3 other people in the class community. This will come in handy if you need to miss a class, if you want to work with someone on an assignment, or while studying for an exam. This is an **essential college skill**, especially for STEM students.

7. **Turn everything in!** Every homework, every discussion, every problem set. Don't allow yourself to skip anything! Also, pay close attention to the dates and start/end times of quizzes and exams, so you don't miss any part of them.
 8. **Prepare for quizzes and exams thoroughly.** You will be allowed to use only pencil, eraser, ruler and scientific calculator on most assessments. Preparing thoroughly for quizzes will help you retain the material for exams. Preparing thoroughly for exams will help you retain this material for when you need it for the classes that come next in the sequence. If you are not prepared well for quizzes and exams, you will likely NOT be able to finish them!
 9. **Don't wait to ask for help!** Whether it's to your classmates or me, get your questions answered in a timely manner. If you're dealing with an unusual or an unexpected challenge, please let me know so I can work with you to keep the class manageable, if possible.
 10. **Practice personal discipline!** Succeeding in a college class requires **personal discipline**. It's quite easy to put things off until later, distract yourself with social media and other apps while doing class activities, etc. A life skill you should practice this quarter: **Be mindful of what you are giving your attention to**. Think carefully about your priorities, and give the most time and attention to your biggest priorities. When working on your homework, turn off all notifications on your devices, silence your phone and keep it out of immediate reach. Calculus requires focus and it will often challenge you. **Don't put off working on something because it's hard or unpleasant**. Learning anything that's worthwhile requires a sustained effort! And that practice is what ultimately leads to true personal growth.
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Course Calendar:

Math 1A Calculus - Tentative Calendar: Fall 2023

	Tuesday	Thursday
Week 1	26-Sep Orientation/Questions 2.1, 2.2	28-Sep 2.2, 2.3
Week 2	3-Oct Problem Set 1 due Quiz 1 2.4	5-Oct 2.5, 3.1
Week 3	10-Oct Problem Set 2 due Quiz 2 3.2	12-Oct 3.3
Week 4	17-Oct Problem Set 3 due Quiz 3 3.4, 3.5	19-Oct 3.5, 3.6
Week 5	24-Oct Problem Set 4 due Midterm Exam 1 3.7	26-Oct 3.8, 3.9
Week 6	31-Oct Problem Set 5 due Quiz 4 3.9, 6.9	2-Nov 6.9, 7.1 (Vol 2)
Week 7	7-Nov Problem Set 6 due Quiz 5 7.2 (Vol 2)	9-Nov 4.1, 4.2
Week 8	14-Nov Problem Set 7 due Quiz 6 4.3	16-Nov 4.4, 4.5
Week 9	21-Nov Problem Set 8 due Midterm Exam 2 4.5	23-Nov Thanksgiving Holiday
Week 10	28-Nov Problem Set 9 due Quiz 7 4.6	30-Nov 4.7
Week 11	5-Dec Problem Set 10 due Quiz 8 4.8, 4.9	7-Dec 4.9, 4.10
Finals Week	12-Dec Final Exam 11:30 a.m. - 1:30 p.m.	14-Dec

Student Learning Outcome(s):

- Analyze and synthesize the concepts of limits, continuity, and differentiation from a graphical, numerical, analytical and verbal approach, using correct notation and mathematical precision.
- Evaluate the behavior of graphs in the context of limits, continuity and differentiability.
- Recognize, diagnose, and decide on the appropriate method for solving applied real world problems in optimization, related rates and numerical approximation.

Office Hours:

M,T	10:00 AM	10:50 AM	In-Person	S-43A
W,TH	01:30 PM	02:30 PM	In-Person	S-55