Course Syllabus

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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, and logarithmic 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

Important:

- **Communication**: You can contact me via email (fischerrani@fhda.edu) or via Canvas message. 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.
- **Engagement**: I will look for your engagement through participation during synchronous sessions, 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 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!
- **Feedback**: Any feedback on your discussions, problem sets and written parts of exams will be provided as annotation or assignment comment in Canvas. If you need additional feedback regarding grading (especially automatically graded items such as homework and quizzes), 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.

Textbook and Calculator:

Great news: your textbook for this class is available for **free** online!
Calculus, Volume 1 from OpenStaxLinks to an external site., ISBN 1-947172-13-1

You have some options to obtain this book:

- View onlineLinks to an external site.
- Download a PDFLinks to an external site.

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, and occasionally a graphing calculator, for this class. This can be a physical or an online app, such as the one at https://www.desmos.com/Links to an external site..

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 Download 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 the synchronous sessions of the 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 for under $20.

Weekly Schedule:

- **Monday -Thursday in S75.** You're expected to attend each of these four meetings. **Also, we will meet Sunday 4-5pm** on Zoom to answer questions about the problem set which is due the next morning. I will take attendance. Be sure to have the prepared lecture notes, writing instrument and scratch paper during these meetings. We will cover new content, but to also go over your questions, occasionally work on problem sets and take quizzes and exams.
- **All days:** Read textbook, work on homework and problem sets, respond to discussion boards, and study!

Office Hours:

1/2 hour before class and 1/2 hour after class in S75, M-Th, or by appointment.

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! 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.

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 start work on them in groups in Zoom breakout rooms, work them out on paper, and submit them individually by the deadline on Monday 10:30am in class. You will start them in class, but will need to finish them up on your own. 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**. 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!*
- *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 small amount of space. Leave some white space around the problem for brief comments.*
- *Do the problems in **order**, showing all work neatly, clearly and completely.*
- *Write your solutions out in full detail, as modeled in the textbook and in lectures. It's important to write up problem sets neatly, showing all work, and explaining the logic behind each step. You should also draw well-labeled and appropriately scaled diagrams and graphs when they are helpful in understanding your solution.*
- *Problem sets are due on Monday by 10:30a.m. You will have one free pass.*

Weekly Discussions:

Each non-exam week, you will have a weekly discussion prompt that you will need to respond to. These are worth points, so be sure to complete them. When grading these posts, 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.

Participation:

Even though this is an online class, you are expected to actively participate. I expect you to:

- Attend each class. I will take attendance at every class Mon-Thurs.
- Ask and answer questions during class. There is nothing more helpful to everyone in the room than hearing from students.
- Outside of class, post and answer questions in 'Questions Discussion Board' (1 point extra credit for posting or answering a question - up to a maximum of 5 extra credit points).

Quizzes:

We will have **eight** quizzes (see the calendar at the bottom of this page). These will usually be similar to your online homework and problem sets. Despite what MyOpenMath states at the top of each quiz, they are untimed. You have from noon until midnight to take the quiz on the day assigned. *IMPORTANT: There will be NO MAKEUPS for any of the quizzes, and your lowest quiz score will be dropped.*

Exams:

We will have **two** midterm exams, and a cumulative final exam on Thursday, June 29 at 9:15am in Room S75 (arrive at 9am). See the calendar on homepage for all dates. Exams must be taken at the scheduled time, so pay careful attention to their dates and times.

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
Weekly Discussions	Top 8 @ 5 points each	40
Quizzes	Top 7 @ 20 points each	140
Exams	2 @ 75 points each	150
Final Exam		125
TOTAL		**700**

Letter Grade based on Overall Percentage

Overall percentage	Your grade will be at least
97% or greater	A+
92% to less than 97%	A
89% to less than 92%	A-
87% to less than 89%	B+
82% to less than 87%	B
79% to less than 82%	B-
75% to less than 79%	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 either within your current groups or using 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/Links to an external site..
5. Use NetTutor for help through Canvas.
6. If you need any technical help with MyPortal, Canvas, etc., visit https://www.deanza.edu/quarter-guide/#LearningLinks to an external site..
7. On the link above, you will also 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.

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.htmlLinks to an external site.. Check out this video produced by De Anza College on this topic: https://www.youtube.com/watch?v=4unoOe-I0eYLinks to an external site..

A note about Discord: I encourage you to ask and answer questions amongst yourselves to strengthen your understanding of topics in this class using any medium, including 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 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 while their exam is open 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/Links to an external site. for information or questions about eligibility, services and accommodations for physical, psychological or learning disabilities.

Calendar:

Math 1A Calculus - Tentative Calendar: Spring 2023					
	Monday	Tuesday	Wednesday	Thursday	Sunday
Week 1	10-Apr	11-Apr	12-Apr	13-Apr	16-Apr
	Orientation/Questions, Sec 2.1	Sec 2.1, 2.2	Sec 2.2, 2.3	Sec 2.3, Online HW 2.1 due	Online HW 2.2. 2.3 due on Sunday
Week 2	17-Apr	18-Apr	19-Apr	20-Apr	23-Apr
	Problem Set 1 due 10:30am, Sec 2.4, Quiz 1	Sec 2.4, 2.5	Sec 2.5	Sec 3.1, Online HW 2.4 due	Last day to drop classes without a W, Online HW 2.5 due on Sunday
Week 3	24-Apr	25-Apr	26-Apr	27-Apr	30-Apr
	Problem Set 2 due 10:30am, Sec 3.1, Quiz 2	Sec 3.2	Sec 3.2, 3.3	Sec 3.4. Online HW 3.1 due	Online HW 3.2, 3.3 due Sunday
Week 4	1-May	2-May	3-May	4-May	7-May
	Problem Set 3 due 10:30am, Sec 3.4, 3,5, Quiz 3	Sec 3.5, 3.6	Sec 3.6, 3.7	Sec 3.7, 3.8, Online HW 3.4, 3.5 due	Online HW 3.6 due
Week 5	8-May	9-May	10-May	11-May	14-May
	Problem Set 4 due 10:30am, Sec 3.8, 3.9, Quiz 4	Sec 3.9, 6.9, Online HW 3.7 due	Review for Midterm 1	Midterm 1 (Sec 2.1-3.6)	Online HW 3.8, 3.9 due
Week 6	15-May	16-May	17-May	18-May	21-May
	Problem Set 5 due 10:30am, Sec 6.9, Quiz 5	Sec 4.1	Sec 4.1, 4.2, Online HW 6.9 due	Sec 4.2, 4.3	Online HW 4.1, 4.2 due
Week 7	22-May	23-May	24-May	25-May	28-May

	Problem Set 6 due 10:30am, Review for Midterm II, Quiz 6	Midterm 2 (Sec 3.9-4.2)	Sec 4.3	Sec 4.3, 4.4	Online HW 4.3 due
Week 8	29-May	30-May	31-May	1-Jun	
	MEMORIAL DAY, no class	Problem Set 7 due 10:30am, Sec 4.4, Quiz 7	Sec 4.5	Sec 4.5, 4.6, Online HW 4.4 due, Last day to drop classes with a W	
Week 9	5-Jun	6-Jun	7-Jun	8-Jun	11-Jun
	Problem Set 8 due 10:30am, Sec 4.6, 4.7	Sec 4.7, Online HW 4.5 due	Review for Midterm 2	Midterm 2 (Sec 3.7-4.5)	Online HW 4.6 due
Week 10	12-Jun	13-Jun	14-Jun	15-Jun	18-Jun
	Problem Set 9 due 10:30am, Sec 4.8, Quiz 8	Sec 4.8, Online HW 4.7 due	Sec 4.9	Sec 4.9	Online HW 4.8 due
Week 11	19-Jun	20-Jun	21-Jun	22-Jun	
	JUNETEENTH, no class	Problem Set 10 due 10:30am, Sec 4.10	Sec 4.10, Online HW 4.9, 4.10 due	Review for final	
Finals Week	26-Jun	27-Jun	28-Jun	29-Jun	
				FINAL EXAM 9:15AM (come at 9am)	

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,W,TH	10:00 AM	10:30 AM	In-Person	S75