Math 150: Calculus I

USD Fall 2020: Section 06
Tues/Thurs: 2:30-3:50
Monday: 1:30-2:25

Instructor: Dr. Hayley Milbourne (Pronouns: She, her)
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Office: Saints of Tekakwitha and Serra Hall 167
Office Hours: Monday 9:30-11:30
Tuesday and Thursday 12:30-2

Text: *Active Calculus* (Boelkins, Austin, & Schlicker, 2019). You can access the text here.

Calculator: A basic TI-30X scientific calculator is the most advanced calculator that will be allowed in this class. No graphing calculators.

Student Learning Outcomes: In this course we will learn the concepts and techniques of elementary differential and integral calculus. But more importantly, we will train ourselves to learn mathematics independently, work in groups to solve problems, and communicate solutions effectively. These are skills that will stay with you throughout your life, long after you have forgotten the details of calculus. At the conclusion of this course, I hope you will be able to do the following:

- ***Learn*** *mathematics, or any other subject, by reading and practicing.*
- ***Analyze*** *problems and situations, and model them using calculus.*
- ***Apply*** *the ideas and methods of calculus to solve problems in mathematics and its applications.*
- ***Deduce*** *valid conclusions using the definitions and theorems of calculus, and* ***explain*** *your conclusions clearly and completely.*

Philosophy and Goals: A major goal of the course is to help you develop a deeper conceptual understanding of important topics in calculus so as to give you a solid foundation for your future mathematics and statistics classes. The orientation in this class will be the belief that mathematics is about developing insight into structures and relationships. Solutions to complex problems arise from understanding them deeply. You should strive to reorganize and deepen your understanding so that you will know mathematics in a way that will be helpful to you in the future. You will be asked to explain your reasoning and focus on underlying concepts, as opposed to merely reporting your solutions. In addition, you will be expected to present your ideas about problems and to make sense of others' ideas.

The method of learning in this class will be group oriented. Activities and discussions will happen within groups and as a class. The group members are encouraged to teach each other what they have learned and what the other person in the group needs to learn. We will strive to engage in teaching and learning in the same manner you will be expected to work with your future colleagues.

Expectation: I built this class on the belief that everyone has the capability to learn mathematics. How we act as individuals and as a class will be the key to accomplishing our goals successfully. With this in mind, we have the following rules:

- **Treat our time with respect.** We have a short amount of time together, so be ready to learn when class starts. This means coming to class early to settle your mind for learning, putting away your cell phone, and staying engaged until class is finished.

- **Approach your classmates with kindness and encouragement.** Creating a successful class means being able to rely on those around us when we are in need. Be the type of person you would like to turn to when you are in need of help.
- **Struggle productively.** My goal is to give you what you need to make an attempt at each homework problem, but I also don't expect that you will always be able to do all of your homework successfully. I want you to work hard, but I also want you to work productively. If you find yourself spending a lot of with without making any progress, contact me. A small bit of direction can make a world of difference.
- **Learning is a process.** The class is set up to have some learning and doing in class, and at a pace that will challenge but not overwhelm you. It's my job to provide you with just the right amount of work and your job to do that work in a good faith way.

Resources: There are many different resources available to you to help you succeed in this course. One in particular that I encourage you to utilize is the **Mathematics Learning Center**. The MLC offers both drop-in and appointment-based tutoring where you can get help on the material in the class. Drop-in tutoring will be conducted on campus and appointments will be virtual. You can find an updated drop-in schedule on the website; the appointments are available to schedule through the Penji app and the availability may change.

Pandemic & General Wellness

In this pandemic era, we all might need some extra help to navigate life. USD has many resources that are free to you, including:

- **COVID-19 student wellness services** and covidsupport@sandiego.edu
- **Counseling Center** 24/7 access to a counselor: (619) 260-4655, press 1 for urgent concerns
- **Disability and Learning Difference Resource Center disabilityservices@sandiego.edu**
- **C.A.R.E. Advocate** 24/7 through Public Safety Dispatch (619) 260-7777
- **Student Health Center** MyWellness Portal **https://mywellness.sandiego.edu/**
    - Non-urgent email **usdhealthcenter@sandiego.edu**

Important Note: When you come to see me with questions, I will ask you questions to determine what you know and/or don't know. Hopefully by clarifying my expectations ahead of time, the frustration will be reduced. The best way to help yourself learn is to get better at asking yourself questions.

- What do I not understand? Is there another way of looking at this problem?
- What concepts are involved, and do I understand them?
- Did I do a problem like this in the past and how does this one relate to that?
- Did the instructor do one like this in class? Check your notes to see if you can get started.
- If I can't even get started on a problem, why? Did I read the textbook, and if so, do I understand what it says?
- Do I have enough time to succeed? What distractions make it hard for me to concentrate?
- What terminology is giving me problems? Remember, mathematics is a language and new words are essential to understanding different new concepts.

Class Policies: Respect yourself, respect your neighbors, respect your environment
No cell phones (texting, calling, playing, listening, ringing, etc)
Cheating yourself and others is not tolerated. I encourage you to study together and discuss the homework but you are expected to write up your own solutions in your own words. If two or more

classmates write-ups look too similar, than it may be assumed that copying took place, which is in violation of the Academic Integrity Policy.

The use of unauthorized materials, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behaviors that defeat the intent of an assessment are unacceptable. Any form of cheating will result in an F and a referral to the Dean for further action.

Note that the drop with a W deadline is November 10th, 2021.

Course Assignments and Expectations

The work for this course falls in three main categories: class participation, homework, and assessment.

Participation and group work: I highly encourage you to utilize group work to challenge, explore, and explain yourself to others through specific problems selected for learning growth. Participation includes asking questions, making a connection, offering personal insight on the material, etc. If I see you not participating, I will ask you to discuss further ways we can make your participation an integral part of class.

We will also be utilizing a participation app called Socrative. This will help track your participation in class and help me gauge how the class is going. As long as you participate each day through the app, you will get the point for that day.

Homework: Homework for this course will be online. The online homework will be done through Edfinity and will be due approximately once a week. These assignments are designed to give you more practice with the material discussed in class and to help prepare you for the quizzes and exams.

Assessment: There will be individual quizzes given nearly every week. What is important about the quizzes is that they provide you a chance to see what all you know about the material in class and to give you a way to gauge what you need more time to understand and what you feel confident about. You may submit quiz corrections on any questions you attempted for up to a 90% on the quiz. Quiz corrections are due within a week of getting your quiz returned to you.

The four exams will be held in class during regular meeting hours. Make up exams will be allowed with a university excused absence, or prior approval from the instructor (me). The exams will be structured around the various course objectives, which you can find later in this syllabus.

The final exam will be held on **Thursday December 16th from 11am-1pm.** The final will have five parts. The first four will be optional and will give you one more chance to improve your score on any of the previous 4 exams. The last part will be required of everyone.

Grading:

Quizzes	15%
Edfinity	25%
Participation	10%
Exams (4)	40%
Final Exam	10%
Total	100%

You are expected to attend class. If you do miss class, be sure to talk to a classmate to take a look at important class notes, discussions, and problems you missed.

Grading Scale:

93% -100% = A	83% - 87% = B	73% - 77% = C	63% - 67% = D
90% - 92% = A-	80% - 82% = B-	70% - 72% = C-	60% - 62% = D-
88% - 89% = B+	78% - 79% = C+	68% - 69% = D+	59% and below = F

Learning Objectives

Limits
L1. I can explain the meaning of a limit beyond describing how to calculate it.
L2. I can compute average rates of change and find slopes of secant lines.
L3. I can graphically and algebraically evaluate the limit of a function at a point or determine that it does not exist, using the appropriate justification.
L4. I can determine the points at which a function is (and is not) continuous, and can use continuity to evaluate limits.
L5. I can identify limits in indeterminant form and can apply L'Hospital's rule correctly.
Differentiation
D1. I can accurately conceptualize the derivative beyond describing how to calculate it.
D2. I can compute derivatives of polynomial, exponential, and logarithmic functions.
D3. I can compute derivatives of trigonometric functions.
D4. I can compute derivatives using the product, quotient, and chain rules.
Applications of Differentiation
A1. I can interpret the first and second derivatives of a function graphically and descriptively.
A2. I can use derivatives and other information to make informed sketches of the graph of a function.
A3. I can use derivatives to solve optimization problems.
A4. I can identify intervals of increase and decrease, concavity, local extrema, critical points, and inflection points when given a graph or a function.
A5. I can use implicit differentiation to solve problems.
Integration
I1. I can find antiderivatives of standard functions.
I2. I can use Riemann sums to approximate the area under a graph.
I3. I can use the Fundamental Theorem of Calculus to evaluate definite integrals.
I4. I can use definite integrals to solve problems involving accumulation.
I5. I can use the u-substitution method to solve integrals.
Overall
O1. I can explain how the concept of limits connect to derivatives and integrals.
O2. I can recognize which applied problems will require a derivative to solve and which will require integration to solve.

Accommodations for Students with Disabilities: It is important to me that this course is accessible to all students. If you have, or believe you may have, a disability or may need accommodations I encourage you to reach out to our Disability and Learning Differences Resource Center (260-4655) http://www.sandiego.edu/disability/ early in the semester so that reasonable accommodations may be implemented as soon as possible. If issues arise as the course moves forward, please reach out to me and we can brainstorm study strategies and possible alternatives to help you succeed in the course.

Title IX Information: The University of San Diego is committed to upholding standards that promote respect and human dignity in an environment that fosters academic excellence and professionalism. Sexual misconduct and relationship violence in any form are antithetical to the university's mission and core values, violate university policies, and may also violate federal and state law. Faculty members are considered "Responsible Employees" and are required to report incidents of sexual misconduct and relationship violence. If you or someone you know has been impacted by sexual assault, dating and domestic violence, stalking or sexual exploitation, please visit www.sandiego.edu/care to access information about university support and resources.

Kumeyaay Land Acknowledgement

I want to acknowledge that the land on which we gather is the traditional and unceded territory of the Kumeyaay Nation. I want to pay respect to the citizens of the Kumeyaay Nation, both past and present, and their continuing relationship to their ancestral lands.

What is a Land Acknowledgment? A Land Acknowledgement is a formal statement that recognizes and respects Indigenous Peoples as traditional stewards of this land and the enduring relationship that exists between Indigenous Peoples and their traditional territories.

Why do we recognize the land? The statement aims to acknowledge the history of the land upon which USD sits and the ongoing relationship of the Kumeyaay people to their traditional territory. By incorporating the land acknowledgement into our syllabi, we can encourage our students to think about their connection to the land and the Kumeyaay people, while demonstrating USD's responsibility as an anchor institution.
To recognize the land is an expression of gratitude and appreciation to those whose territory you reside on, and a way of honoring the Indigenous people who have been living and working on the land from time immemorial. It is important to understand the long-standing history that has brought you to reside on the land, and to seek to understand your place within that history. Land acknowledgements do not exist in a past tense, or historical context: colonialism is a current ongoing process, and we need to build our mindfulness of our present participation. It is also worth noting that acknowledging the land is Indigenous protocol. – http://www.lspirg.org/knowtheland

I am so happy that you will be in this class this semester and I hope you have a successful experience.