Math 3A: Calculus with Applications I
Course Syllabus*

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Office Hours: Monday and Thursday, 12-1 PM, or by appointment. To be held via Zoom.

Text: James Stewart, *Calculus: Early Transcendentals*
Any edition is fine, so long as it says "Early Transcendentals"–there have been no recent changes to the content of calculus. You can get a physical copy of an older edition for less than $10 or find a digital version for free online. We will roughly be going through the first four chapters.

About the Course

Course Content

This is meant to be a first course in calculus. We will plan to cover differential calculus including analytic geometry, functions and limits, derivatives, techniques and applications of differentiation, and logarithmic and trigonometric functions. Upon successfully completing this course, students should expect to be able to do the following:

- Explain the idea of a mathematical function via a variety of representations, including graphical, numerical, algebraic, and verbal. Students will be able to compare and contrast these varying representations, and translate between any two such descriptions.
- Justify the derivative as a rate of change, and apply this understanding to solve problems.
- Interpret the derivative geometrically, and apply this knowledge to accurately sketch curves of functions.
- Successfully and fluently evaluate limits and derivatives using a variety of appropriate techniques. Students will be able to give intuitive justifications for the validity of such techniques.
- Apply problem-solving skills to successfully solve problems in a variety of contexts.
- Determine the reasonableness of solutions. Students will be able to determine the validity of properties including sign, size, and units of measurement.
- Communicate clearly about mathematics, both orally and in writing. Students will be able to clearly explain solutions to problems in differential calculus using appropriate mathematical language.

*This syllabus may be reasonably altered if deemed necessary later in the term. In such an event, students will be notified.

Course Structure

For the day-to-day flow of course material, please see the course schedule posted on the GauchoSpace page.

This course will be taught in a primarily asynchronous manner. This means that attendance will not be required during any live meeting times. Generally, the course will consist of:

- Lecture videos posted on GauchoSpace and accompanying readings in the textbook.
- A weekly problem-solving session via Zoom. Attendance will not be mandatory.
- Homework assignments due each week on Tuesday, Wednesday, and Thursday via WeBWorK.
- Two midterm exams.
- Three quizzes, given on weeks that we do not have midterm exams.
- A final expository paper.

Evaluation

Your grade in this course will be determined by the following breakdown:

Quizzes	10%
Homework	20%
Midterm 1	20%
Midterm 2	20%
Final Paper	30%

Letter grades will be determined by the usual breakdown:

A+	$> 100\%$	B	83 - 86%	C-	70 - 72%
A	93 - 100%	B-	80 - 82%	D+	67 - 69%
A-	90 - 92%	C+	77 - 79%	D	63 - 66%
B+	87 - 89%	C	73 - 76%	D-	60 - 62%

and F otherwise. Individual assignments will not be curved, but if necessary, these ranges will be shifted to benefit students once all grades are in. All grades will be posted in the gradebook on GauchoSpace. Please check the gradebook frequently and let me know if you believe that anything is inaccurate.

If you choose to take the class as "Pass/No-Pass," please be advised that a grade of C or above will result in a Pass (P), while a grade of C- or below will result in a No-Pass (NP).

Homework

Homework in this course will be assigned via WeBWorK. You will be able to access these assignments directly from the GauchoSpace page. Homework assignments will automatically close at 11:59 PM on the date they are due. Late homework will not be accepted.

WeBWorK is an online homework system which is free to use. One major benefit of completing homework on WeBWorK is that you will be able to receive instant feedback as to whether or not your answers are correct. Homework is a tool to help practice the material, so on most questions you will be given unlimited attempts to find the correct answer. However, I may limit attempts on some multiple choice or true/false questions, so be warned.

While WeBWorK does not require you to input anything but the final answer, I *strongly* encourage you to practice **writing full solutions** for each problem. Not only will you better learn and retain information, but you will also be better prepared to present solutions on exams. You should note that successfully completing the homework on WeBWorK is a bare minimum for understanding the course material. In particular, simply getting 100% on all of the homework assignments is not necessarily sufficient to do well on exams or the final paper.

I would highly encourage you to attempt additional practice problems from the textbook, especially those problems which are not conducive to an online format, such as questions which ask for written explanations, questions which involve graphing, etc.

Quizzes and Exams:

Every week (except week six) you will have either a quiz or midterm exam. These assessments will be taken on Gradescope, but you can access them directly from the GauchoSpace page. The weekly assessment will be available starting on Wednesday of that week at 11:59 PM. Quizzes will close on Fridays at 11:59 PM, while midterm exams will close on Sundays at 11:59 PM. Please see the course calendar for a detailed schedule. The assessments will be timed, but you may choose any time in the window of availability to actually sit for the assessment.

Assessments will be open course-materials. This means that you can use any notes, videos, or other resources available on the Gauchospace page, as well as any materials you have personally created for this class. However, you must work independently. You will not be allowed to use Google, materials from outside of this course, or to solicit help from anyone else.

Final paper:

In lieu of a final exam, you will be asked to write a final paper for this course. If you continue to study mathematics, or another discipline which uses mathematics as a significant tool, then you will increasingly be asked to write about mathematical concepts. Mathematical writing takes a different guise than writing in other disciplines, so it is important to practice communicating effectively.

You should view the final paper as an opportunity for you to demonstrate your understanding of the course material in a non-timed, low-stakes environment. For more details on the final paper, please see the GauchoSpace page which contains a detailed assignment sheet and rubric.

Resources

I encourage you to utilize the following resources in your efforts to master the material.

- Myself: As your instructor, I am committed to helping you learn the material in this course. Try to attend problem-solving sessions via Zoom or stop by virtual office hours if you have questions. Please reach out to me directly if you have any questions, comments, or concerns about anything related to the course.
- Nectir: I have created a Nectir channel for this class. You can use this to ask and answer questions about the course structure and content. At the end of the course you will be asked to submit a typed

final paper. Nectir is also an excellent place for you to practice using LaTeX, which is a typesetting system that will allow you to type mathematical notation.

- MathLab: A virtual MathLab is being organized via Zoom. This is a drop-in tutoring space where you can ask math graduate students questions about the course content. See the link on Gauchospace for hours of operation.
- CLAS: Free supplemental tutoring for lower division math courses. This resource is not affiliated with the Mathematics department, so I cannot vouch for its utility or accuracy. For more information, visit clas.sa.ucsb.edu.
- Your textbook: My lectures will roughly be following the textbook. The textbook has explanations of everything we will be talking about, as well as plenty of practice problems.
- Other calculus textbooks: There are a number of excellent calculus textbooks which you might enjoy reading in addition to Stewart's. One suggested text would be "Calculus: Early Transcendental Functions" by Larson and Edwards.
- Paul's Online Notes: Paul's Notes are a series of notes freely posted online that could prove beneficial to you throughout your lower division math experience here. Differential calculus can be found at http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx or by Googling "Paul's Notes Calculus".

DSP

Providing academic accommodations to students with disabilities is a shared responsibility of the campus. Students with disabilities are responsible for ensuring that the Disabled Students Program (DSP) is aware of their disabilities and for providing DSP with appropriate documentation. Please submit requests for accommodations as soon as possible so that I have a reasonable amount of time to accommodate you.

Academic Integrity

Per the UCSB Student Conduct Code, academic honesty is required of all students in this course and in the UCSB community at large. Intellectual growth requires honestly with regards to your coursework. Please resist the urge to cheat in this course. If you are having difficulty inside or outside of the course, you should instead feel free to reach out to me directly. **Violations of academic integrity will result in a score of "0" on the corresponding assignment and will be reported to the Office of Student Conduct.** Academic misconduct includes, but is not limited to:

- Providing or obtaining assistance on quizzes or exams.
- Using unauthorized resources–e.g. Google, Chegg, other students, tutors, etc.–during quizzes or exams.
- Turning in work without properly citing all sources.
- Sharing course materials without the explicit written permission of the instructor or creator.
- Fabricating an excuse for missing or late work.

For more information on academic integrity at UCSB, please visit https://studentconduct.sa.ucsb.edu/academic-integrity.

Statement of Equity and Justice

The mathematics community is one that is enriched and enhanced by the diverse experiences and identities of its participants. It is my goal that this course will benefit all student participants, regardless of race, ethnicity and national origin, gender and gender identity, sexuality, class, or religion. It is the shared responsibility of all mathematicians, and academics in general, to cultivate a community which welcomes all learners and actively supports the needs of students who have historically been systemically excluded from the mathematics community and the academic community at large. To this end:

- We acknowledge that the land on which we gather at UCSB is the traditional homeland of the Chumash people.
- If you have not already done so, please include your pronouns on GOLD. You can specify your pronouns by going into GOLD and visiting the 'My Personal Info' page (under the 'About Me' menu). Updating your pronouns on GOLD will also update them on GauchoSpace, eGrades, and a number of other campus systems. If you have a name which differs from the one listed on GauchoSpace, please let me know.
- If at any point in the course you feel as though your experiences outside of the classroom are impacting your learning environment, please let me know.
- Please feel free to give me feedback at any point of the course. You may do so non-anonymously by sending me an email, or anonymously by using the "Anonymous Course Feedback" button on the right-hand side of the GauchoSpace page. You can use these mechanisms both to tell me about things that are going well in the course and to offer suggestions for improvement.