Mathematics 1310–001
Spring 2017

Instructor	Kyle R. Steffen `steffen@math.utah.edu` Office: JWB 105
Class time and place	Monday, Wednesday, Friday, 8:05–9:25 am, JFB B-1
Teaching Assistant	China Mauck `mauck@math.utah.edu` Office: LCB Loft (fourth floor)
Lab time and place	Thursdays, 8:35–9:25 am, LCB 215 Thursdays, 9:40–10:30 am, HEB 2002
Learning Assistant	Dylan Blair `dylb31@gmail.com`
Office hours	Monday 10:30–11:30 AM, JWB 105 (Kyle); Tuesday 3:00–4:00 PM, WEB 1622 (Dylan); Wednesday 11:00 AM – 12:00 PM, WEB 1622 (China); Thursday 11:30 AM – 12:30 PM, WEB 1622 (Dylan); Thursday 2:00–3:00 PM, JWB 105 (Kyle); Friday 11:00 AM – 12:00 PM, WEB 1622 (China); Or by appointment—send one of us an e-mail, and we will set up a time and place.
Class webpage	Canvas: `https://utah.instructure.com/courses/429410`
Text	*Calculus: Concepts and Contexts*, 4th edition, by Stewart. ISBN: 978-0495557425. See `http://www.math.utah.edu/schedule/bookInfo/` for more information.
Prerequisite	Prerequisites: "C" or better in ((MATH 1050 AND 1060) OR MATH 1080 OR (MATH 1060 AND Accuplacer CLM score of 80+)) OR AP Calc AB score of 3+ OR Accuplacer CLM score of 90+ OR ACT Math score of 28+ OR SAT Math score of 630+ OR Department Consent.
Course information	Math 1310 (Engineering Calculus I) is a four-credit hour, semester-long course.
Course description	Differential and integral calculus with a focus on engineering applications and projects: functions and models; rates of change in science and engineering, limits and derivatives; related rates; derivatives and shapes of graphs; optimization; Newton's method; definite integrals, anti-differentiation and Fundamental Theorem of Calculus; techniques of

integration; numerical and symbolic integration with software; arclength, area and volumes via integration.

Expected learning outcome

Upon successful completion of this course, a student should be able to:

1. Understand how to transform functions into other functions through x- and y-translations and rescaling, re-parameterizations, and function composition.
2. Know the properties of special classes of functions including logarithms, exponential functions, polynomials, and rational functions and know how to obtain function inverses when they exist.
3. Master the concept of a limiting value of a function f(x) = y when x approaches a value c, know when limits exist, utilize limit laws, know how the property of continuity of a function at c relates to its limiting value, know how asymptotic behavior can be described by limits, and how limiting values can be specified even when the function is not defined at c.
4. Understand how to use limits to compute the derivative of a function that describes rate of change of a function.
5. Utilize derivatives to model how two related quantities change with respect to each other, including motion of objects in terms of velocity and acceleration.
6. Know the methods of differentiation for different classes of functions including exponential, logarithmic, trigonometric, inverse trigonometric, power functions, and compositions, sums, products, quotients of functions, as well as knowing the how to differentiate functions that are only implicitly defined by an equation.
7. Utilize the derivative in applied contexts, including function approximation, and how the average slope of a function relates to the derivative through the mean value theorem.
8. Obtain the derivative of one quantity by knowing the derivative of the other, if two quantities are related by an equation.
9. Use linear approximations to perform numerical/algorithmic equation solving via Newton's method.
10. Utilize the derivative to find maximum, minimum, or otherwise "optimal" input valuess for equations important in science, business and engineering.
11. Understand the definition of the integral of a function as the limiting value of an increasingly large average of function values.
12. Relate the integral to the area under the function's curve, know how to approximate the integral by a finite sum, and how to integrate over infinite-length domains.
13. Master specific integration techniques, including substitution, integration by parts, and partial fractions.
14. Understand the key concept underlying definite integration, that it computes the net accumulation of a quantity through summation of the change in the quantity amount per unit of time or space, over a specified interval of time or space.
15. Read and understand problem descriptions, then be able to formulate equations modeling the problem usually by applying geometric or physical principles.

16. Select the appropriate calculus operations to apply to a given problem, execute them accurately, and interpret the results using numerical and graphical computational aids.
17. Gain experience with problem solving in groups, be able to communicate effectively about problem objectives and the use of solving methods with peers, and solve problems in a team fashion. Students will also learn how to articulate questions effectively with both the instructor and TA, and be able to effectively communicate problem solutions.

Tutoring lab

The Mathematics Tutoring Center, adjacent to the John Widtsoe Building (JWB) and LeRoy Cowles Building (LCB), Room 155, offers free, drop-in tutoring for students in MATH 1310 (among other classes). The hours are: 8:00 AM – 8:00 PM on Monday, Tuesday, Wednesday, and Thursday; and 8:00 AM – 6:00 PM on Friday.

The tutoring center will open on Tuesday, January 17th, and will be open through finals. The tutoring center will be closed during Spring Break (March 12–19) and on Presidents' Day (Monday, February 20).

See `http://www.math.utah.edu/ugrad/tutoring.html` for more information.

Private tutoring

The ASUU Tutoring Center, 330 SSB, offers inexpensive private tutoring subsidized by student fees. There is also a list of private tutors at the Math Department office in JWB 233.

Computer lab

Same hours and location as the Mathematics Tutoring Center (see above). See `http://www.math.utah.edu/ugrad/lab.html` for more information. Printers in the computer lab can be used only for math- and physics-related print jobs (and are free to use for these print jobs).

Assessment

- *Homework* – Homework will be assigned each Wednesday afternoon (except during Spring Break), and due at the start of class the following Wednesday.
- *Quizzes* – There will be a short quiz (10–15 minutes) each Friday at the start of class, except weeks when an exam is given.
- *Midterm exams* – There will be two midterm exams in class, on Friday, February 10th; and Friday, March 31st.
- *Final exam* – The final exam will be comprehensive. It will be held in class (JFB B-1), at the University-scheduled date and time: Friday, April 28th, 8–10 AM.

Absence from exams – Any schedule conflict causing you to miss an exam is your responsibility: Please let me know by e-mail *well in advance*. Failure to do so may result in a zero for the corresponding exam.

Grading

Your final grade will be a weighted average according to the following: 10% Homework, 15% Quizzes, 15% Lab Assignments, 5% Lab Attendance, 15% per Midterm Exam, 25% Final Exam, with some additional considerations (stated below). Letter grades will be assigned as follows:

$100 \geq N \geq 91$	A	$74 > N \geq 71$	C
$91 > N \geq 87$	$A-$	$71 > N \geq 67$	$C-$
$87 > N \geq 84$	$B+$	$67 > N \geq 64$	$D+$
$84 > N \geq 81$	B	$64 > N \geq 61$	D
$81 > N \geq 77$	$B-$	$61 > N \geq 57$	$D-$
$77 > N \geq 74$	$C+$	$57 > N$	E

- Your lowest two quiz scores will be dropped (this means that the other quizzes will be worth a slightly larger percentage of your final grade).
- If you take all three exams, your lowest midterm score will be replaced by your score on the final exam, or you will receive a 2% bonus to your semester grade (whichever results in the highest grade).
- There will be no extra credit.

Scores will be posted on Canvas.

Calculators

You may find it helpful to have a graphing calculator. However, if calculators are allowed on exams or quizzes, I will only allow scientific calculators—no graphing or programmable calculators. This will be discussed more in class.

Important Dates

1/9: Classes begin

1/13: Last day to add classes without a permission code

1/20: Last day to add a class, drop a class without being charged tuition, elect the CR/NC option, or audit a class

3/3: Last day to withdraw from classes (must pay tuition)

4/21: Last day to reverse CR/NC option

4/25: Classes end

4/28: Final exam (JFB B-1, 8–10 AM)

See the Academic Calendar for a complete list:
`http://registrar.utah.edu/academic-calendars/`

Strategies for success:

- Attend class, and ask questions—being engaged helps you learn.
- Read the current section of the textbook before class. Read over your notes after class.
- Form study groups with other students. Working in groups helps students self-evaluate what they know and what they do not know.
- Cramming does not work. Study regularly and often throughout the semester. Focus on understanding the material rather than memorizing formulas.

- Missing quizzes will affect your grade. Know when quizzes and exams will be held. Know how to compute your grade.
- Ask for help during office hours, at the Tutoring Center, or from your classmates. Please do not be shy to ask questions during and after lectures, to come by during office hours, or to e-mail me with any concerns.

Lecture schedule Tentative schedule, assuming three textbook sections per week.

Week	Date	Sections
1	Jan 9–13	1.3, 1.5, 1.6
2	Jan 16–20	1.7, 2.1, 2.2
3	Jan 23–27	2.3–2.5
4	Jan 30–Feb 3	2.6–2.8
5	Feb 6–10	3.1, 3.2 (exam)
6	Feb 13–17	3.3–3.5
7	Feb 20–24	3.6–3.8
8	Feb 27–Mar 3	3.9, 4.1–4.2
9	Mar 6–10	4.3–4.5
10	Mar 13–17	Spring Break
11	Mar 20–24	4.6–4.8
12	Mar 27–31	5.1, 5.2 (exam)
13	Apr 3–7	5.3–5.5
14	Apr 10–14	5.7–5.9
15	Apr 17–21	5.10, 6.1
16	Apr 24, 28	Review, Final Exam

ADA Statement The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services (CDS), 162 Olpin Union Building, 581- 5020 (V/TDD). CDS will work with you and me to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to CDS.

Student responsibilities All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. You have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, collusion, fraud, theft, etc. Students should read the Code carefully and know you are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee.

Link to student code: `http://regulations.utah.edu/academics/6-400.php`

Classroom equity I strive to be ethical, kind, fair, inclusive and respectful in my classroom and expect students to behave likewise. In this regard, I have these requests of you, my student:

1. Please inform me of whichever pronouns you prefer me to use for you. I will put great effort into honoring your request and ask that you correct me if I do happen to make a mistake.
2. Please do tell me, discreetly, if you have any sort of anxiety disorder, TBI, PTSD, C-PTSD, or any other challenge that would cause psychological harm to you by me calling on you in class. I want students to feel a little uncomfortable and stretched during class, while working on problems as a large group, but I definitely don't want to cause any human being harm. So, please just tell me if that is the case for you and I will confidentially accommodate your request.
3. If your preferred name is different than your legal first name (the preferred name you chose does indeed show up in CIS on my roll sheet, but not yet in Canvas), please log into Canvas and go to Account (on far left)–>Settings and change your Display Name to be the name you prefer to be addressed by. This will help me greatly to know students' names, and to address you correctly.

Disclaimer This syllabus is a preview of the course. I have aspired to make it as accurate as possible. However, I reserve the right to make reasonable changes to the above policies as I deem appropriate. Any such changes will be announced in class and on Canvas.

Best of luck for a great semester!