Instructor: Janina Letz

Office: JWB 211
Email: letz@math.utah.edu
Office Hours: TBD and by appointment

TA: TBD

Course Information: MATH 1310, Engineering Calculus I is a 4-credit semester course.

Class Time and Place: 08:35am – 09:25am Mondays, Tuesdays, Wednesdays, Fridays in WBB 207
In addition to class every student has to sign up for a lab section. There are two possible times: Thursday 7:30am – 8:20am in AEB 306 and Thursday 8:35am – 9:25am in AEB 306


Canvas: Canvas will be used for posting course announcements, homework assignments, grades, files and any relevant supplementary material. You are also welcome to make use if the Canvas discussion board to discuss course problems or topics. You can access the Canvas page through CIS or by logging in at utah.instructure.com. Students should check the Canvas page regularly for course information and resources. Email notifications and correspondence will be sent to the student’s UMail address (\([u\text{-}number]@utah.edu\)); this email account must be checked regularly.

Prerequises: One of the following

- C or better in College Algebra and Trigonometry (MATH 1050 AND MATH 1060)
- C or better in Precalculus (MATH 1080)
- AP Calc or AB score of 3 or better
- Accuplacer CLM score of 95 or better
- ACT Math score of 28 or better
- SAT Math score of 630 or better
- Departmental consent

Course Overview: The calculus is a set of tools to analyze the relationships and functions essential for modeling physical processes important in science and engineering applications.
Grading: The grades of homework, exams, and finals will weight as follow in your overall average.

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<td>Labs</td>
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<td>Lab attendance</td>
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<td>Homework</td>
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<td>Midterms</td>
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<td>Final</td>
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The instructor reserves the right to change the grading scheme during the course of the semester. Students will be notified of any adjustments.

Labs: Each Thursday in the lab section there will be a problem sheet given. This will be due at the beginning of the next lab section. The problems will be be applied questions and more involved problems. Students are expected to work on the current problem sheet in the lab section. These problem sheets will be graded for correction. The two lowest scores will be dropped. No late submissions will be accepted.

Homework: There will be homework due each Friday at the beginning of class (at thanksgiving the Wednesday before). This homework will cover material of the last half of the week before and the first half of that week. The problems will be posted on Canvas. These problems will be graded for completeness and additionally three problems will be graded for correctness. The two lowest homework scores will be dropped. Homework will only be accepted in class, so no electronic copies or late homeworks.

Quizzes: Each Friday class there will be a 10 minute quiz given (unless there is a midterm). This quiz will contain 2–3 short problems. The questions will be taken from textbook examples, class examples, assigned problems or problems very much like those problems. The two lowest quiz scores will be dropped, thus there will be no make-up or alternate quizzes offered for any reason.

Midterms: There will be three 50-minute midterm exams given on selected Fridays. These will be comprehensive. Dates of the midterms are September 15, October 20 and November 17. There will be no retakes of exams, for any reason. You may take an alternate exam if you talk to me about it first and explain the emergent, extenuating circumstances that make it necessary. It is 100% your responsibility to communicate with me as soon as is possible, before the exam occurs (or as soon as possible). Talking to me after the problem will be sufficient reason for me to allow you to get a zero on that test. I reserve the right to make alternate exams more difficult than the scheduled exam.

Final exam: A two-hour comprehensive exam will be given. The final exam is scheduled for Monday December 11 from 8am-10am in WBB 207. There won’t be an early final for any reason.
If a curving is necessary, everything will be shifted down by a few points. Final course letters will be determined as follows:

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The instructor retains the right to modify this grading scheme during the course of the semester; students will, of course, be well notified of any adjustments.

**Extra Help:** Dot not hesitate to come to my office during office hours or by appointment to discuss a homework problem or any aspect of the course.

**Tutoring Center:** The T. Benny Rushing Mathematics Tutoring Center (room 155, the lower level between JWB and LCB) offers free tutoring. Beginning the second week of classes, tutoring will be available from 8am to 8pm Monday through Thursday and 8am to 6pm on Friday.

**Private Tutoring:** If you want to hire an outsider tutor (for a fee), you can find a list of such people through the math department.

**Departmental Videos:** The math department has a full set of lecture videos which you are welcome to use to supplement our course material. These can be found at http://www.math.utah.edu/lectures/

**Calculators:** Calculators will not be allowed on exams or quizzes. They may be used on homework or labs, but you should still write out the details of your computation. It is in your best interest not to become too dependent on your calculator.

**Expected Learning Outcomes: The tools and skills:**

- Students will understand how to transform functions into other functions through $x$- and $y$-translations and rescaling, re-parameterizations, and function composition. Students will also know the properties of special classes of functions including logarithms, exponential functions, polynomials, and rational functions; and know how to obtain function inverses $f^{-1}(y) = x$ when they exist.
- Students will master the concept of a limiting value of a function $f(x) = y$ when $x$ approaches a value $c$, know when limits exists, utilize limit laws, how the property of continuity of a function at $c$ relates to its limiting value, how asymptotic behavior can be described by limits, and how limiting values can be specified even when the $f(c)$ is not defined.
- Students will understand how to use limits to compute the derivative of a function $f'$ that describe or rate of change of a function $f$. Students will be able to utilize derivatives to model how two related quantities change with respect to each other, including motion of objects by in terms of velocity and acceleration. Students will also learn the methods of differentiation for different classes of functions including exponential and logarithmic functions, trigonometric and inverse trigonometric functions, power functions, and
compositions, sums, products, and quotients of functions, as well as differentiating functions that are only implicitly defined by an equation. Students will also be able to 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. If two quantities are related by an equation, students will be able to obtain the derivative of one quantity by knowing the derivative of the other. Students will know how to utilize linear approximations to perform numerical/algorithmic equation solving via Newton’s method. Also, students will be able to utilize the derivative to find maximum, minimum, or otherwise ”optimal” input values for equations important in science, business, and engineering.

- Students will understand the definition of the integral of a function as the limiting value of an increasingly large average of function values. They will be able to relate the integral to anti-differentiation, when appropriate, through the fundamental theorem of calculus. Students will also be able to 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. Specific integration techniques will also be mastered, including substitution, integration-by-parts, and partial fractions. Finally, students will understand the key concept underlying 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 an specified interval of time or space.

**Problem solving fluency:** In addition to topical content, students will also gain experience and further mastery of complete problem solving fluency. Students will be able to read and interpret problem objectives, be able to select and execute appropriate methods to achieve the aforementioned objectives, and be able to interpret and communicate results.

**ADA:** The American Disability Act requires that reasonable accommodations be provided for students with cognitive, systemic, learning and psychiatric disabilities. Please contact me at the beginning of the quarter to discuss any such accommodations you may require for this course.

**Important Dates:**

- Drop Deadline .......................................................... September 1
- Midterm #1 ................................................................. September 15
- Withdraw Deadline .................................................. October 20
- Midterm #2 ................................................................. October 20
- Midterm #3 ................................................................. November 17
- Course Final ............................................................. December 11

**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. Students 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, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, and I will do so, beginning with verbal warnings and progressing to dismissal from and class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. 
http://regulations.utah.edu/academics/6-400.php

Additional Policies: I reserve the right to change my policies stated in this syllabus at any point in the semester. If I do make a change to a policy, I will announce it in class and put an announcement on Canvas.