Instructor: Janina Letz  
Office: JWB 211  
Email: letz@math.utah.edu  
Office Hours: Tuesday and Wednesday after class (11:40am-12:40pm) in WEB 1705

TA: Donald Tiago Chacon-Taylor  
Office: LCB Loft  
Email: dct@math.utah.edu  
Office Hours: TBD

Course Information: MATH 1320, Engineering Calculus II is a 4-credit semester course.

Class Time and Place: 10:45am–11:35am Mondays, Tuesdays, Wednesdays, Fridays in LCB 225  
In addition to class every student has to sign up for a lab section. There are two possible times: Thursday 9:40am–10:30am in WBB 206 and Thursday 10:45am–11:35am in JTB 110


Prerequisites: One of the following  
- C or better in 1310 or 1311  
- AP Calc BC score of 3 or better  
- 1320 can alternatively be entered by earning a "C" or better in Math 1210 and by being concurrently enrolled in the MATH 1320 "boot camp" (Math 13) that covers the material in 1310 that is missing from the traditional 1210 sequence  
- 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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<tbody>
<tr>
<td>Labs</td>
<td>15%</td>
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<tr>
<td>Lab attendance</td>
<td>5%</td>
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<tr>
<td>Homework</td>
<td>15%</td>
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<tr>
<td>Quizzes</td>
<td>10%</td>
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<tr>
<td>Midterms</td>
<td>30%</td>
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<tr>
<td>Final</td>
<td>25%</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 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. This homework will cover material of the second half of the last week before and the first half of current week. The problems will be posted on Canvas. The problems will be grouped by section, they will be graded for completeness (1 point per problem) and additionally one or two problems of each section will be graded for correctness (4 points for these problems). The five lowest scores (per section) 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 February 2, March 2 and April 6. 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 Friday April 27 from 10:30am-12:30pm in LCB 225. 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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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>100-93</td>
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<tr>
<td>A-</td>
<td>92-90</td>
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<tr>
<td>B+</td>
<td>89-87</td>
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<tr>
<td>B</td>
<td>86-83</td>
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<tr>
<td>B-</td>
<td>82-80</td>
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<tr>
<td>C+</td>
<td>79-77</td>
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<tr>
<td>C</td>
<td>76-73</td>
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<tr>
<td>C-</td>
<td>72-70</td>
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<tr>
<td>D+</td>
<td>69-67</td>
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<tr>
<td>D</td>
<td>66-63</td>
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<tr>
<td>D-</td>
<td>62-60</td>
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</tbody>
</table>

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.

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-number]@utah.edu); this email account must be checked regularly.

Extra Help: Do 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 be able to utilize methods of integration to compute volumes of objects with circular-shaped aspects, and compute lengths of curves. These applications introduce a higher-level concept of integration, involving the summation of small volume segments $dV$ or small length segments $ds$, which are computed by performing an appropriate parameterization to a real-number-line integral in terms of $dx$.

- Students will be skilled in using integration to compute problems important in physics and engineering. Students will know how to compute of an average value of a function using the mean value theorem for integrals, the center of mass for objects, and the computation of energy as a force integrated over a distance. Students will also be able to utilize physical laws to formulate differential equations that solve for the motion of masses by forces of gravitation, friction, electrostatics, to name a few. Students will also become familiar with the phenomenon of exponential growth and decay in science and engineering contexts.

- Students will become skilled in computations and applications of infinite sequences and sums. Students will become familiar with the properties of infinite sums to either converge to a finite value or diverge to an infinite value, and will learn about methods to determine convergence. Students will be able to represent functions as a Taylor series, and use Taylor’s theorem to approximate functions and estimate error from using finitely many terms of the Taylor series.

- Students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- and 3-dimensional coordinate systems, vectors and vector operations including the dot and cross product, and equations of lines, planes, and other surfaces. Students will also learn how to represent motion of objects in 3D using vector functions, how to represent velocity and acceleration using vector projections into tangential and centripetal coordinates of acceleration, and how to characterize curves in space by computing arc length and curvature. For functions of 3D surfaces, students will be able to characterize aspects of surfaces and volumes using partial derivatives and the gradient vector. Partial derivatives will also be used to describe approximating tangent planes to points on surfaces, and how to compute derivatives of multi-dimensional function compositions can be performed using a multi-dimensional version of the chain rule.

**Problem solving fluency:**

- Students will be able to read and understand problem descriptions, then be able to formulate equations modeling the problem usually by applying geometric or physical principles. Solving a problem often requires a series of transformations that include utilizing the methods of calculus. Students will be able to select the appropriate calculus operations to apply to a given problem, execute them accurately, and interpret the results using numerical and graphical computational aids.
• Students will gain experience with problem solving in groups. Students should be able to effectively transform problem objectives into appropriate problem solving methods through collaborative discussion. Students will also learn how to articulate questions effectively with both the instructor and TA, and be able to effectively articulate how problem solutions meet the problem objectives.

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 .......................................................... January 19
- Midterm #1 ................................................................. February 2
- Withdraw Deadline ..................................................... March 2
- Midterm #2 ................................................................. March 2
- Midterm #3 ................................................................. April 6
- Course Final ............................................................. April 27

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.