MATH 1320-001, Engineering Calculus II, Fall 2020

Class Location & Meeting Times: M,Tu,W,F / 8:35 AM - 9:25 AM on Canvas via Zoom

Instructor: Lei Wu (preferred pronouns: he/him/his)
Email: lwu@math.utah.edu
Zoom contact: u0748701@utah.edu.

Office Hours: Wednesdays, 9:35 AM - 10:35 AM or by appointment
Location: Online via Zoom.

Course Type: Interactive Video Conferencing (IVC - synchronous online)
Course Information: Math 1320 Engineering Calculus II is a 4 credit course.
Prerequisite Information: "C" or better in MATH 1310 OR AP Calc BC score of 3 or better OR Department Consent.
Course Description: Differential and Integral Calculus II, with a focus on applications and projects for engineers: integral expressions for moments, centers of mass, and work; infinite series and sequences; power series and Taylor series; vectors, dot and cross products, and the geometry of space; the calculus of vector functions and particle motion in space; differential calculus for functions of several variables, including linear approximation, partial and directional derivatives, chain rule, and multi-variable optimization; multivariable integration in Cartesian and polar coordinates and applications.


Technical requirements: Students are expected to be computer literate, with the ability to navigate Canvas and Zoom. These skills are critical for accessing all features and resources of this course. It is strongly encouraged that students log into Zoom for class with audio and video enabled, as this will help foster the interactive environment that leads to successful learning. For the online synchronous course components (e.g., lectures and labs), a strong internet connection and adequate bandwidth is needed. Tests will be proctored using Zoom with video enabled, so students are required to have a working webcam (note: a phone with a webcam is sufficient if no laptop is available).

Course Lectures & Attendance: The lectures of this course will be given live over zoom at the scheduled time from 8:35 AM - 9:25 AM on MTuWF. Students are expected to join the live zoom session and participate in class. The zoom sessions will be accessed through Canvas. On-line Attendance is strongly encouraged but not required. Please do not come to class if you are experiencing COVID-19 symptoms.
Canvas: Canvas will be used for posting course announcements, lecture videos, 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.
For technical assistance, review the Canvas Getting Started Guide for Students and/or contact TLT, Knowledge Commons, etc..

Homework: Weekly homework will be assigned but not collected. The assignments will be posted on Canvas and homework will cover material up to and including the previous Friday. It is in your best interest to complete these as quiz and exam questions will be similar to assigned problems.

Quizzes: There will be weekly quizzes except the first week and test weeks. Quizzes will be posted on Canvas by Thursday morning and should be submitted via Canvas no later than 11:30 PM (MDT). Scanned images of your quizzes must be submitted online through Canvas, preferably as a pdf. Although you will
have the whole day to submit it, the quizzes should take no more than 30 minutes. Quizzes are closed-book. You should not use any resources, unless stated otherwise. The two lowest quiz scores will be dropped. There are no “make-up” quizzes. Students who miss a quiz will receive a “0” on the missed quiz.

**Weekly Labs:** Every Thursday students will meet online for their laboratory section. These lab days will be spent working on more challenging problems. The lab assignments are due the following Thursday. Attendance is required and will count for 5 of student’s total grades. The lowest lab score will be dropped. More information is TBD.

**Exams:** Two 60-minute exams will be given during the semester. Midterm exams will be given through Canvas. Scanned images of your exams must be submitted online through Canvas, preferably as a pdf. No textbook notes or calculators will be allowed. Exams will be proctored through Zoom, so a webcam will be required. Online resources and communication with others (either in person or electronically) will not be allowed during the exams. Violations of these rules will be considered academic misconduct; a zero will be given on the exam and a report will be sent to the College of Science.

One cumulative 120 minute exam will be given at the end of the semester. It will be the same format and follow the same rules as the midterm exams, only it will be longer.

- Exam 1: Friday, Oct. 2 in class
- Exam 2: Friday, Nov. 6 in class
- Final: Thursday, Dec. 10 8:00 am – 10:00 am

It is the student’s responsibility to ensure the accuracy of all recorded homework, quizzes, online assignments, and exam grades. Also you should keep as record all your graded assignments. If you see any error in your grades on Canvas, reach out to the instructor as soon as possible, or at the latest within two weeks from when the assignment was returned.

**Grading:** The grades will be determined using the following weights:

- Quizzes: 15%
- Lab: 5%+15%
- Exam 1 and 2: 20%×2
- Final: 25%
- Note: no scores will be dropped.

**Grading Scale:** Semester letter grades will be converted from numerical semester scores (N) as follows:

<table>
<thead>
<tr>
<th>N</th>
<th>Grade</th>
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<tbody>
<tr>
<td>100 ≥ N ≥ 93</td>
<td>A</td>
</tr>
<tr>
<td>93 &gt; N ≥ 90</td>
<td>A−</td>
</tr>
<tr>
<td>90 &gt; N ≥ 88</td>
<td>B+</td>
</tr>
<tr>
<td>88 &gt; N ≥ 83</td>
<td>B</td>
</tr>
<tr>
<td>83 &gt; N ≥ 80</td>
<td>B−</td>
</tr>
<tr>
<td>80 &gt; N ≥ 78</td>
<td>C+</td>
</tr>
<tr>
<td>78 &gt; N ≥ 73</td>
<td>C</td>
</tr>
<tr>
<td>73 &gt; N ≥ 70</td>
<td>C−</td>
</tr>
<tr>
<td>70 &gt; N ≥ 68</td>
<td>D+</td>
</tr>
<tr>
<td>68 &gt; N ≥ 63</td>
<td>D</td>
</tr>
<tr>
<td>63 &gt; N ≥ 60</td>
<td>D−</td>
</tr>
<tr>
<td>60 &gt; N</td>
<td>E</td>
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</tbody>
</table>

**Course Expected Learning Outcomes:** Upon successful completion of this course, a student should be able to:
1. Utilize methods of integration to compute volumes of objects with circular-shaped aspects, and compute lengths of curves.
2. Using integration to compute problems important in physics and engineering, e.g., an average value of a function using the mean value theorem for integrals, the center of mass for objects, and energy as a force integrated over a distance.
3. Determine convergence of infinite sums, represent functions as a Taylor series, use Taylor’s theorem to approximate functions, and estimate error from using finitely many terms of the Taylor series.
4. Perform basic vector computations and vector operations including the dot and cross product.
5. Represent motion of objects in 3D using vector functions, represent velocity and acceleration using vector projections into tangential and centripetal coordinates of acceleration, and 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.
6. Calculate the partial derivatives of a multivariate function, describe approximating tangent planes to points on surfaces using partial derivatives, and compute derivatives of multi-dimensional function compositions using a multi-dimensional version of the chain rule.
7. Calculate multivariable integration on varied 2- and 3D domains using cartesian and polar coordinates.

**Official Drop/Withdraw Dates:** The last day to add, drop (delete), elect CR/NC, or audit classes is Friday 4th September; the last day to withdraw from this class is Friday, October 16. The last day to reverse CR/NC option is Friday November 27. Please check the academic calendar for more information pertaining to dropping and withdrawing from a course. Withdrawing from a course and other matters of registration are the student’s responsibility.

**Syllabus subject to change:** This syllabus is meant to serve as an outline and guide for our course. Please note that your instructor may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas.

**ACADEMIC CODE OF CONDUCT** Students are encouraged to review the Student Code for the University of Utah: [https://regulations.utah.edu/academics/6-400.php](https://regulations.utah.edu/academics/6-400.php). In order to ensure that the highest standards of academic conduct are promoted and supported at the University, students must adhere to generally accepted standards of academic honesty, including but not limited to refraining from cheating, plagiarizing, research misconduct, misrepresenting one’s work, and/or inappropriately collaborating. A student who engages in academic misconduct as defined in Part I.B. may be subject to academic sanctions including but not limited to a grade reduction, failing grade, probation, suspension or dismissal from the program or the University, or revocation of the student’s degree or certificate. Sanctions may also include community service, a written reprimand, and/or a written statement of misconduct that can be put into an appropriate record maintained for purposes of the profession or discipline for which the student is preparing.

**Inclusivity Statement:** It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students’ learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a re-source, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, and veteran status, and other unique identities. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.

**The Americans with Disabilities Act:** 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 and Access, 162 Olpin Union Building, 801-581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability and Access.

**Safety Statement:** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.
**Addressing Sexual Misconduct:** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veterans status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report the police, contact the Department of Public Safety, 801-585-2677 (COPS).

**University Counseling Center:** The UCC staff is committed to supporting the mental health needs of our campus community, while mitigating COVID-19 risks in our department. As of Wednesday, March 18th, the UCC is providing all services as telephone and secure video conference appointments. Their phone number is 801-581-6826. Monday-Friday, 8:00am-5:00pm. For after-hours emergencies, contact the 24/7 Crisis Line: 801-587-3000. More information is at https://counselingcenter.utah.edu.