

# MATH 1320-009 Engineering Calculus II, Spring 2021

**Instructor:** Dihan Dai

**Email:** dai@math.utah.edu or Canvas message

**Zoom:** <https://lms-utah.zoom.us/j/2969454046>

**Office Hours:**

- Dihan Dai: TBD
- Thomas Hill (TA): TBD

**Text:** *Calculus: Concepts and Contexts*, by James Stewart, and Rigdon (4th edition), **ISBN-13:** 978-0495557425

For information on purchasing the textbook, go to <http://www.math.utah.edu/schedule/bookInfo/>

## Course Details:

- Course Type: IVC
- Location & Meeting Times:
  - MTWF at 8:35-9:25 AM on Canvas (Zoom),

All lectures will be recorded and posted online.

**Course Information:** Math 1320 Engineering Calculus II is a 4 credit course.

**Prerequisite Information:** "C" or better in 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:

- You are expected to be computer literate and Canvas and zoom navigation skills are expected. Knowledge and navigation of canvas and zoom is critical to access all features and resources of this course.
- We will have live Zoom sessions on class days. Thus a strong internet connection and adequate bandwidth is needed.

**Canvas:** Canvas will be used for posting course videos, announcements, homework assignments, grades, files and any relevant supplementary materials. You are also welcome to make use of 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](http://utah.instructure.com). You 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.

**Grading:** The following are the grade components and the percentage each contributes to your final grade:

- **Homework Assignments (15%)**- Roughly two to three textbook sections are due most Fridays at midnights. The homework will typically cover material covered up to and including the preceding Monday. If you click on a homework assignment in the Assignments tab in Canvas, you will see the list of assigned problems. Two of the problems will be selected for grading by the grader, each graded out of 5 points. There will also be 5 points given for completion. The lowest homework score will be

dropped. Homework will only be accepted in class, no electronic copies. Late homework is, in general, not accepted. You must submit their homework via Gradescope. To get full credits, you must show all necessary steps to solve the questions.

- **Quizzes (10%)**- A 15-minute Canvas quiz with 2 or 3 multiple choice questions will be assigned every Tuesday. The quiz will cover relevant topics covered in the previous week's lectures (including basic concepts and calculations). Potential quiz topics will be posted on Canvas. The lowest quiz score will be dropped. There will be **NO** make-up quizzes. However, you will have two attempts for each online quiz.
- **Labs (20% = 5%+15%)**- 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 (exact time TBD, please check the due on Canvas). Attendance are required and will count for 5% of student's total grades. The remaining 15% will be determined by the lab submissions that will be graded. The lowest lab score will be dropped. More information is TBD.
- **Midterm Exams (30%, 15% each)**- Two 60-minute midterm exams will be given on selected Fridays during the class meeting time. You will need to finish the exam and submit their work via Gradescope by the due. The exam will not be proctored. Students are allowed to use their textbooks, notes, and a calculator during the exam. Internet resources and collaborations are not allowed and will be treated as cheating. To get full credits, you must show all necessary steps to solve the questions. A practice exam will be posted a week prior to each midterm that will cover the same material. The dates of the midterms are Feb 26th and April 9th.
- **Final Exam (25%)**- A two-hour comprehensive exam will be given. As with the midterms, a practice final will be posted a week prior. The final exam is (tentatively) on Fri., April 30th, 2020, 8:00 am - 10:00 am.

You should check their grades regularly on Canvas and Gradescope and notify me if there are mistakes in your grades.

Students with university excused absences (band, debate, student government, intercollegiate athletics) should make alternate arrangements with me as soon as possible if the absence interferes with any course components.

Final course letter grades will be determined as follows: If  $X$  is your course percentage weighted according to the above, then  $\{X \geq 93\% \Rightarrow A, X \geq 90\% \Rightarrow A-, X \geq 87\% \Rightarrow B+, X \geq 83\% \Rightarrow B, X \geq 80\% \Rightarrow B-, X \geq 77\% \Rightarrow C+, X \geq 73\% \Rightarrow C, X \geq 70\% \Rightarrow C-, X \geq 67\% \Rightarrow D+, X \geq 63\% \Rightarrow D, X \geq 60\% \Rightarrow D-, X < 59\% \Rightarrow E\}$ .

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

### Additional Resources

- **Tutoring Center & Computer Lab**- There is free online tutoring provided by T. Benny Rushing Mathematics Student Center. For more information see <http://www.math.utah.edu/undergrad/mathcenter.php>.
- **Departmental Videos**- The math department has a full set of lecture videos on Calculus I, II (after 17.5A), & III (before 21) which you are welcome to use to supplement our course material. These can be found at <http://www.math.utah.edu/lectures/>

**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.

**Important Dates:**

- Drop deadline: Friday, January 29.
- Presidents Day: Monday, February 15.
- Last day to withdraw: Friday, March 12.
- Midterm 1: Fri., February 26, 8:35 - 9:35 am.
- Non-instructional day: Friday, March 5.
- Non-instructional day: Monday, April 5.
- Midterm 2: Fri., April 9, 8:35 - 9:35 am.
- Final Exam, Fri., April 30th, 2020, 8:00 - 10:00 am.

**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>

**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 & 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 & Access.

**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 to the police, contact the Department of Public Safety, 801-585-2677(COPS).

**Student Names and Personal Pronouns:** Class rosters are provided to the instructor with the student's legal name as well as Preferred first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your UIDcard, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email [bpeacock@sa.utah.edu](mailto:bpeacock@sa.utah.edu) to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.

**Wellness Statement:** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at [www.wellness.utah.edu](http://www.wellness.utah.edu) or 801-581-7776.

**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](http://safeu.utah.edu).

**Disclaimer:** I reserve the right to change any information in this syllabus throughout the semester. If I make a change to the course policies, I will inform you in class, and post an updated version of the syllabus to Canvas. I will hold you accountable for information that is stated in class or posted on Canvas.