

## MATH 2210-001, Calculus III, Spring 2018

- Instructor:** Travis Mandel  
**Time:** MWF, 2:00 PM–2:50 PM  
**Location:** LCB 225 (LeRoy E. Cowles Building)  
**Office Hours:** JWB 112, M 3:00-4:00 and WF 1:00-2:00, plus by appointment.
- Email:** [mandel@math.utah.edu](mailto:mandel@math.utah.edu)
- Text:** *Calculus, with Differential Equations*, 9th edition  
by Varberg, Purcell and Rigdon. ISBN-10: 0-13-230633-6.
- Course Information:** Math 2210, Calculus III is a 3-credit semester course.
- Prerequisites:** "C" or better in (MATH 1220 OR MATH 1250 OR MATH 1320) OR AP Calculus BC score of at least 4.
- Course Description:** Vectors in the plane and in 3-space, differential calculus in several variables, integration and its applications in several variables, vector fields and line, surface, and volume integrals. Green's and Stokes' theorems.
- Expected Learning Outcomes:** Upon successful completion of this course, a student should be able to:
1. Compute dot and cross products of two vectors, projection of one vector onto another vector.
  2. Convert between cylindrical, rectangular and spherical coordinates. Understand when it's prudent to switch to one coordinate system over another in computing an integral.
  3. Determine the equation of a plane in 3-d, including a tangent plane to a surface in 3-d.
  4. Find the parametric equations of a line in 3-d.
  5. Perform calculus operations on functions of several variables, including limits, partial derivatives, directional derivatives, and gradients; understand what the gradient means geometrically.
  6. Find maxima and minima of a function of two variables; use Lagrange Multipliers for constrained optimization problems.
  7. Understand divergence and curl of a vector field.
  8. Compute double and triple integrals in rectangular, spherical and cylindrical coordinates; proper use of double or triple integrals for finding surface area or volume of a 3-d region.
  9. Compute line and surface integrals.
  10. Determine if a vector field is conservative and if so, find the corresponding potential function.
  11. Use and understand when to apply Green's Theorem, Gauss' Divergence Theorem and Stokes Theorem.

## Class Structure

**Course Outline:** We will cover the following sections from the book:

Chapter 10 (10.4): Parametric Representation of Curves in the Plane

Chapter 11 (11.1 - 11.9): Geometry in Space & Vectors (probably skipping 11.7)

Chapter 12 (12.1 - 12.9): Derivatives for Functions of Two or More Variables

Chapter 13 (13.1 - 13.9): Multiple Integrals (probably skipping 13.5)

Chapter 14 (14.1 - 14.7): Vector Calculus

This course is fast-paced. It is essentially four credit hours worth of material crammed into a three credit hour course. Most sections will therefore get only one class day.

**Grading:** The grades will be calculated as follows:

Homework: 20%

Weekly Quizzes: 10%

Midterm: 15%

Midterm: 15%

Midterm: 15%

Final Exam: 25%

**Homework:**

All homework will be done online using **WeBWorK**. Go to <http://www.math.utah.edu/online/ww/> and look at the "More Links for Students" section for more information. Click the 2210-001 link next to "T Mandel" to access the homeworks for our course. You should receive login information via email to your umail account within the first few days of class. **If you get an answer wrong, you can try again until you get it right with no penalty!**

Homeworks will normally be due on **Tuesday nights at 10:00 PM** (sometimes Wednesday nights instead) and will cover material from the previous week. With WeBWorK, it is easy for you to email me with questions about the problems. I encourage you to take advantage of this.

**Note:** I will likely not respond outside of normal working hours, so if you email me after around 4:30 PM on Wednesday, you might not get a response before the homework is due. **Do not wait until the last minute to do the homework.**

**Weekly Quizzes:**

We will typically have a short (10-15 minute) quiz **at the end of class on Wednesday**. These will be one or two questions on the sections covered by the homework due that week. We will not have a quiz on the first week of class, and probably no quizzes on test weeks either. Other exceptions will be posted on Canvas. There are no make-up quizzes, but **your 3 lowest quiz scores will be dropped.**

- Midterms:** There will be three 50-minute midterms throughout the semester. They will be during normal class time, in our usual classroom. I plan to have them on the following dates and covering the following sections, but I reserve the right to change these. I will announce in class and post on Canvas if a change is made.
- Midterm 1: Wednesday, February 7, [10.4, 11.1-11.9]
- Midterm 2: Friday, March 9 [12.1-12.9]
- Midterm 3: Friday, April 6 [13.1-13.9]
- Final Exam:** [Tuesday, May 1, 2018, 1:00 - 3:00 pm, in our usual classroom \(LCB 225\).](#)  
The final exam is comprehensive, meaning that it covers material from the entire semester, not just the end of it. However, material covered since the third midterm (i.e., Chapter 14) will be weighted more heavily.
- Canvas:** I plan to use Canvas (<https://utah.instructure.com/>) for this course, at least for posting your grades, the syllabus, and test reviews and solutions. To log into Canvas, you use the same student ID and password that you use for Campus Information System.
- Calculators:** Calculators may be used on homework, but are **not** allowed on any quizzes, tests, or the final exam.
- Grading Scale:** Final course letter grades will be determined as follows: If  $X$  is your course percentage weighted according to the above, then  $\{X \geq 90\% \Rightarrow A, X \geq 86\% \Rightarrow A-, X \geq 82\% \Rightarrow B+, X \geq 76\% \Rightarrow B, X \geq 72\% \Rightarrow B-, X \geq 68\% \Rightarrow C+, X \geq 62\% \Rightarrow C, X \geq 58\% \Rightarrow C-, X \geq 54\% \Rightarrow D+, X \geq 48\% \Rightarrow D, X \geq 44\% \Rightarrow D-, X < 44\% \Rightarrow E\}$ . 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.

## Useful Resources

- Using the Textbook:** The textbook is a great resource that students don't always take advantage of. I recommend that you read the sections in addition to attending my lectures. Also, if you want to practice extra problems, I would suggest trying the odd-numbered problems from the book (these have answers in the back).
- Online References:** There are *tons* of calculus resources online. In particular, there are nice **lecture videos** at <http://www.math.utah.edu/lectures/> which are a great supplement to my lectures. Also, Kelly MacArthur's website (<http://www.math.utah.edu/~macarthu/spring15/math2210.html>) has practice problems, exam reviews, and other useful resources from when she's taught the course.
- Tutoring Center & Computer Lab** There is free tutoring in the T. Benny Rushing Mathematics Student Center (room 155, the lower level between JWB and LCB), as well as a computer lab. For more information see <http://www.math.utah.edu/undergrad/mathcenter.php>

**Private Tutoring** University Tutoring Services, 330 SSB. There is also a list of tutors at the math department office JWB 233.

## Additional Information

**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, veteran's 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.