

## MATH 2210-006, Calculus III, Spring 2017

- Instructor:** Travis Mandel  
**Time:** MWF, 09:40AM–10:30AM  
**Location:** JFB 102 (James Fletcher Building)  
**Office Hours:** JWB 112, MF 10:45-11:45 plus M 1:30-2:30, 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 - 12.8): 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%

Midterm 20%

Midterm 20%

Midterm 10%

Final Exam 30%

(Note: There will be 3 midterms. Your lowest midterm score will count for 10% of your grade and your top two midterm scores will each count for 20% of your final grade.)

Any changes will be announced on Canvas.

**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 2210-006 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, so there is no excuse for low homework grades.**

For now, homeworks will be due on Tuesday nights at 10:00 PM and will cover material from the previous week. This is to allow you to work on the homework during the weekend and ask questions in office hours on Monday. Also, with WeBWorK, it is easy for you to email me with questions about the problems, and I am usually reasonably quick to respond. I encourage you to take advantage of this.

I recommend doing the homework as we cover the sections throughout the week. I do not guarantee a response to questions sent to me the night the homework is due. **Do not wait until the last minute to do the homework.**

**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: Friday, February 3, [10.4, 11.1-11.9]

Midterm 2: Friday, March 3 [12.1-12.9]

Midterm 3: Friday, April 7 [13.1-13.9]

- Final Exam:** [Tuesday, May 2, 2017, 8:00 - 10:00 am, in our usual classroom \(JFB 102\).](#)  
The final exam is comprehensive, meaning that it covers material from the entire semester, not just the end of it.
- 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 tests or the final exam.
- Grading Scale:** I hope that no curve will be necessary, but this will depend on the grades. In the absence of a curve, the grading scale will be the usual:  
A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62), E (0-59).

## 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/~macarthur/spring15/math2210.html>) has practice problems, exam reviews, and other useful resources from when she's taught the course.
- Tutoring Lab:** T. Benny Rushing Mathematics Student Center (next to JWB and LCB), Room 155  
M - Th 8 a.m. - 8 p.m.  
F 8 a.m. - 6 p.m.  
(opens Wednesday) (closed Saturdays, Sundays and holidays)  
They are also offering group tutoring sessions. If you're interested, inquire at the Tutoring Lab. <http://www.math.utah.edu/ugrad/tutoring.html>
- Private Tutoring:** University Tutoring Services, 330 SSB  
(they offer inexpensive tutoring). There is also a list of tutors at the Math Department office in JWB233.
- Computer Lab:** also in the T. Benny Rushing Mathematics Student Center, Room 155C.  
M - Th 8 a.m. - 8 p.m.  
F 8 a.m.- 6 p.m.  
Link to computer lab is <http://www.math.utah.edu/ugrad/lab.html>

## Additional Information

### Additional Policies:

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.

You need to have a valid email address registered with Campus Information System. I will regularly send emails to the class and will hold you accountable for receiving that information.

If you have questions about any exam grade, or you want to appeal the grading of the exam, you must bring it to me within one week of me handing back the exam. I'm happy to look over your appeal and/or questions and give my feedback in order to benefit your learning, but it must be done in this one week time-frame.

If you cheat on any homework or exam, I will automatically give you a zero for that grade. Depending on the severity of the cheating, I may decide to fail you from the class. Please note that the use (or even just pulling it out of your pocket) of a cell phone or any other electronic internet device or calculator during an exam is considered cheating and cause for receiving an automatic zero on any exam. Also, if you exhibit any other behaviors that are unethical, like offering me a bribe to give you a better grade (even if you later claim you were joking), I will report your behavior to the Dean of Students

I reserve the right to make changes to the syllabus at some point in the semester. If I do make a change, I will announce it in class and via email.

### 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.

### 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. You 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, collusion, fraud, theft, etc. Students should read the Code carefully and know you are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from 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>