

# MATH 2210-005: Calculus III

## Spring 2022

Lecture: TR 6:00-7:30pm LCB 225

**Instructor:** Peter McDonald

**Pronouns:** he/him/his

**Email:** mcdonald@math.utah.edu

**Office:** JWB 212

**Office Hours:** TR 5:00-6:00pm, or by appointment (in-person and on Zoom)

**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.

**Prerequisite(s):** "C" or better in (MATH 1220 OR MATH 1250 OR MATH 1320) OR AP Calculus BC score of at least 4.

**Credit Hours:** 3

**Text:** *Calculus, with Differential Equations*, 9<sup>th</sup> Edition, Varberg, Purcell, and Rigdon; **ISBN-13:** 978-0132306331

**COVID-19 Considerations:** University leadership has urged all faculty, students, and staff to model the vaccination, testing, and masking behaviors we want to see in our campus community. These include:

- Vaccination (including your booster)
- Masking indoors
- If unvaccinated, getting weekly asymptomatic coronavirus testing

As a reminder, students must self-report if they test positive for COVID-19 at [coronavirus.utah.edu](https://coronavirus.utah.edu).

### Communication and Technology Expectations:

- It is easiest to reach me via Canvas message or emailing me directly at the email listed above. I check email 2-3 times a day between the hours of 11am-8pm.
- I communicate to the class primarily through Canvas announcements. Please turn your notifications on so that you don't miss any updates about the course.
- Students should be generally familiar with using Canvas. Homework assignments will be posted to Canvas and completed homework will need to be uploaded to Canvas. Quizzes will be delivered via Canvas.

### Grading Policy:

- **Homework Assignments (20%)**- Roughly three textbook sections are due most Wednesdays at midnight, uploaded as a single pdf to Canvas. The homework will typically cover material covered up to and including the preceding Thursday. If you click on a homework

assignment in the Assignments tab in Canvas, you will see the list of assigned problems. Each homework will be worth 30 points - 5 points each for 3 problems randomly selected questions and 15 points for completion of the remaining problems. The lowest two homework scores will be dropped. Additionally, two late homeworks will be accepted up to a week late.

- **Quizzes (10%)**- There will be a 30 minute weekly quiz posted to Canvas at the conclusion of class on Thursday that will be available until Monday at midnight (except for the weekends after exams). The quiz will cover relevant topics covered in the week's lectures. The lowest two quiz scores will be dropped. Additionally, students will have the opportunity to submit quiz corrections to receive up to full credit back for points missed. Quiz corrections are due a week after a quiz is due and can only be submitted for a quiz that a student has actually taken.
- **Midterm Exams (40%, 20% each)**- Two 50-minute midterm exams will be given on select Thursdays. A list of practice problems will be posted a week prior to the midterm that will cover the same material. Dates of the midterm exams will be Thursday February 17 and Thursday March 31.
- **Final Exam (30%)**- A two-hour comprehensive exam will be given. As with the midterms, practice problems and a topics list will be posted a week prior. Our final exam is scheduled for Thursday April 28th from 6:00-8:00 pm in LCB 225. Sections of the final exam will correspond to each midterm, and I will replace one of each student's midterm grades with the grade on the corresponding part of the final exam (if it helps that student's grade).

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.

### Letter Grade Distribution:

Final course letter grades will be determined as follows:

	+		-
<b>A</b>		92.0-100	90.0-91.9
<b>B</b>	88.0-89.9	82.0-87.9	80.0-81.9
<b>C</b>	78.0-79.9	72.0-77.9	70.0-71.9
<b>D</b>	68.0-69.9	62.0-67.9	58.0-61.9
<b>E</b>		0-57.9	

Grades will not be rounded (that is, you need a 92.0 to get an A). 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.

**Course Outcomes:** Upon successful completion of this course, a student should be able to:

- (1) Perform basic vector computations, as well as dot and cross products of two vectors and 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.

### Important Dates

Drop Deadline .....	Friday, January 21
<b>Exam 1</b> .....	<b>Thursday February 17</b>
Withdraw Deadline .....	Friday, March 4
<b>Exam 2</b> .....	<b>Thursday March 31</b>
<b>Final Exam</b> .....	<b>Thursday, April 28, 6pm</b>

**Calculator Policy:** Calculators may be used on homework assignments and labs, but will not be allowed during quizzes or exams. Quiz and exam problems will be designed so that they do not require calculators.

**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>. 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. **Specifically, looking up solutions to an assignment online or using sites such as Chegg is forbidden and will result in a grade of zero for the assignment.**

## **Additional Policies:**

**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).

**University 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).

**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 resource, 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. gender, sexuality, disability, age, socioeconomic status, ethnicity, race, culture, 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.

**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.

**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.

### **Other Resources:**

**Math Tutoring Center:** There is free tutoring in the T. Benny Rushing Mathematics Student Center. For more information, visit their website at <http://www.math.utah.edu/undergraduate/mathcenter.php>

**Learning Center:** The University of Utah Learning Center is offering free tutoring this semester, including tutoring for MATH 2210. For more information, visit their website at <https://learningcenter.utah.edu/>

**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/>

**Discrimination and Harassment:** 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 Office of the Dean of Students, 270 Union Building, 801-581-7066. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS). Please see Student Bill of Rights, section E <http://regulations.utah.edu/academics/6-400.php>. I will listen and believe you if someone is threatening you.

**Undocumented Student Support:** Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit [dream.utah.edu](http://dream.utah.edu).

**LGBT Resource Center:** If you are a member of the LGBTQIA+ community, I want you to know that my classroom is a safe zone. Additionally, the University of Utah has an LGBT Resource Center on campus. They are located in Room 409 in the Olpin Union Building. Hours: M-F 8-5pm. You can visit their website to find more information about the support they can offer, a list of events through the center and links to additional resources: <http://lgbt.utah.edu/>. Please also let me know if there is any additional support you need in this class.

**Veteran's Center:** If you are a student veteran, the University of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M-R 8am-5pm. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: <http://veteranscenter.utah.edu/>. Please also let me know if you need any additional support in this class.

**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.