

# MATH 2210-003: Calculus III

## Fall 2020

Lecture: MW 6:00-7:30pm IVC

**Instructor:** Peter McDonald

**Pronouns:** he/him/his

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

**Office:** JWB 212

**Office Hours:** MW 5:00-6:00pm IVC

**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:** Students must self-report if they test positive for COVID-19 via [coronavirus.utah.edu](https://coronavirus.utah.edu).

**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.

### **Communication and Technology Expectations:**

- It is easiest to reach me via my email listed above. I check email 2-3 times a day between the hours of 10am-8pm.
- The course will be delivered via Zoom as a mix of lecture and group work. Additionally, students will be expected to watch approximately 30 minutes of lecture videos a week outside of class.
- Students should come to class prepared to participate and are encouraged to have their video cameras on if possible. This helps me get to know you all!
- Office hours will be conducted via Zoom.
- Students should be generally familiar with using Canvas. Homework and exams will need to be uploaded to Canvas and quizzes will be delivered via Canvas. Canvas is also a great place to start discussions about homework and the course material.
- Exams will be proctored via Zoom during our regular class time (except for Exam 4 which will take place during the final exam block for this class). Students will need access to a computer with a working webcam for these exams. Additionally, students will need to be able to scan exams using a device separate from the device their webcam is on (usually a phone).
- Given that regular computer access will be crucial to success in this course, it is recommended that all students have access to a personal computer. For students who do not have access to a computer, the Marriott library is loaning laptops to students. More information can be found at <https://lib.utah.edu/coronavirus/checkout-equipment.php>.

### **Grading Policy:**

- **Homework (20%)**
  - There will be weekly homework, assigned from the textbook. The assignments will be posted on Canvas each Wednesday and must be uploaded to Gradescope the following Wednesday by the beginning of class. Be sure to show all work.
  - Each homework will be graded for completion. In addition, the grader will randomly select 3 problems to grade.
  - Two late homework assignments will be accepted up to 1 week late. Any regrade requests for an assignment must be received within a week of grades being posted.
- **Quizzes (10%)**
  - **There will be a 30-minute, open-note quiz every week, except exam weeks.** Quizzes will be available through Canvas and can be taken anytime after class on Wednesday until Friday at midnight.
  - The quiz will cover the material covered in the previous week. Quiz questions will be adapted from textbook examples, class examples, and assigned problems.

- Quizzes will be open note but closed everything else. If you miss points on a quiz, you will be able to submit a regrade request for up to full credit up to a week following the quiz. If you do not take a quiz, you will receive a zero and will not be allowed to make up the lost points.
- **There will be no make-up quizzes. Your lowest two quiz grades will be dropped.**

• **Four In-class Exams (17.5% each, 70% total)**

- There will be four exams, one for each chapter of material covered. The dates for these exams are fixed and are listed at the end of this syllabus. A practice exam will be posted roughly a week prior to the exam that will cover the same material.
- There will be no retakes of exams and I will not offer the exam at a later date except in extenuating circumstances that are communicated to me as far in advance as possible. Any regrade request must be received within a week of grades being posted.

**Letter Grade Distribution:**

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

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.

**Important Dates**

Drop Deadline .....	Friday, September 4
Labor Day (NO CLASS) .....	Monday, September 7
<b>Exam 1</b> .....	<b>Wednesday September 23</b>
<b>Exam 2</b> .....	<b>Wednesday October 14</b>
Withdraw Deadline .....	Friday, October 16
<b>Exam 3</b> .....	<b>Wednesday November 11</b>
Thanksgiving Break (NO CLASS) .....	November 26-29
<b>Exam 4</b> .....	<b>Monday, December 7, 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 online tutoring via the T. Benny Rushing Mathematics Student Center. For more information, visit their website at <http://www.math.utah.edu/undergrad/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.

**Course Roadmap Week-by-Week:** Below is an outline and rough schedule of the sections and topics covered in this course.

**Week 1** Introduction, Chapters 11.1, 11.2

**Week 2** Chapters 11.3, 11.4, 11.5

**Week 3** Chapters 11.5, 11.6, 11.7

**Week 4** Chapters 11.8, 11.9, 12.1

**Week 5** Chapters 12.2, 12.3, Exam 1 (Sep. 23)

**Week 6** Chapter 12.4, 12.5, 12.6

**Week 7** Chapters 12.7, 12.8, 12.9

**Week 8** Chapters 13.1-13.2, Exam 2 (Oct. 14)

**Week 9** Chapters 13.3, 13.4, 13.5

**Week 10** Chapters 13.6, 13.7, 13.8

**Week 11** Chapters 13.9, 14.1, 14.2,

**Week 12** Chapters 14.3, Exam 3 (Nov. 11)

**Week 13** Chapters 14.3, 14.4

**Week 14** Chapters 14.5, 14.6

**Week 15** Chapter 14.7, review

**Week 16** Exam 4 Monday Dec. 7th from 6-8pm (during final exam block)