Math 2210: Calculus III

Instructor: Daniel Bragg - bragg@math.utah.edu
Website: `http://math.utah.edu/~bragg/2210_F22/`
Lecture: MoWe 6:00PM - 7:30PM (JWB 335)
Office Hours: TBD
Text: Calculus with Differential Equations, by Varberg, Purcell, and Rigdon (9th edition). For information on purchasing the textbook, see https://www.math.utah.edu/resources/bookinfo.php

Course Information: Math 2210 is a 3 credit course.
Prerequisite Information: A grade of "C" or better in MATH 1220, MATH 1250, or MATH 1320, or an AP Calculus BC score of at least 4.
Course Description: Vectors in two and three dimensions, differential and integral calculus in several variables, partial derivatives, vector fields, and line, surface, and volume integrals. Green's and Stokes' theorems.

Course Organization:

Canvas: Homework, grades, announcements, and supplementary files will be posted to the course Canvas page. Access the Canvas page through CIS.

Grading: Grades will be calculated from the following components.

- **Homework (20%) -** Homework will be assigned weekly, excepting exam weeks. You can view the homework assignments on Canvas. All homework should be turned in electronically on Canvas (no paper copies accepted). You can either typeset your assignments using LaTex, or handwrite and then scan them.

  Each week, three problems will be selected and graded out of 5 points each. There will also be 5 points for completion. At the end of the semester, your lowest homework score will be dropped.

  The homework is where most of your learning will take place. It is the most important part of the class. You are encouraged to talk with other students, tutors, instructors, and so on about the problems. However, you should write up your solutions without outside input.
- **Midterm Exams (25% each, total 50%) -** There will be two midterm exams, on September 28 (9/28) and November 9 (11/9). Each will replace one lecture, and have a time limit of 90 minutes.
- **Final Exam (30%) -** There will be a cumulative final exam on December 12 (12/12) from 6:00 PM - 8:00 PM in JWB 335.

No calculators are allowed on exams. Don't worry - the exams will be designed so that you won't need them.

If you have a university excused absence (band, debate, student government, intercollegiate athletics) which conflicts with an exam, you should let me know as soon as possible so we can make alternate arrangements.

Additional Resources:

- **Tutoring -** The Mathematics Student Center (155 JWB/LCB) offers free tutoring. See the following link:

  https://www.math.utah.edu/undergraduate/mathcenter.php.

  You can find private tutors at the ASUU Tutoring Center (330 SSB).

- **Recorded Lectures -** You can find a full set of recorded lectures for this course at the following link:

  http://www.math.utah.edu/lectures/.

- **Past Exams and Notes -** The math department maintains the following website for Math 2210. On it you can find notes and exams from past semesters.

  http://www.math.utah.edu/online/2210/

Expected Learning Outcomes: Upon successful completion of this course, a student should be able to do the following.

1. Perform computations with vectors, including computing the projection of one vector onto another vector and computing dot and cross products of two vectors.
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.

Course Schedule: The following is an approximate schedule of the sections we will cover each week of the semester. This schedule is subject to change.

- **Week 1 - (8/22, 8/24) -** Chapters 10.4, 11.1
- **Week 2 - (8/29, 8/31) -** Chapters 11.2, 11.3, 11.4
- **Week 3 - (9/5, 9/7) -** No lecture Monday (Labor Day). Chapters 11.5, 11.6, 11.7
- **Week 4 - (9/12, 9/14) -** Chapters 11.8, 11.9, 12.1
- **Week 5 - (9/19, 9/21) -** Chapters 12.2, 12.3, 12.4, 12.5
- **Week 6 - (9/26, 9/28) -** Chapter 12.6, review, Exam 1 (Sep. 28)
- **Week 7 - (10/3, 10/5) -** Chapters 12.7, 12.8, 12.9
- **Week 8 - (10/10, 10/12) -** No lecture (Fall Break)

- **Week 9 - (10/17, 10/19) -** Chapters 13.1-13.2, 13.3
- **Week 10 - (10/24, 10/26) -** Chapters 13.4, 13.5, 13.6
- **Week 11 - (10/31, 11/2) -** Chapters 13.7, 13.8, 13.9
- **Week 12 - (11/7, 11/9) -** Chapters 14.1, review, Exam 2 (Nov. 9)
- **Week 13 - (11/14, 11/16) -** Chapters 14.1, 14.2, 14.3
- **Week 14 - (11/21, 11/23) -** Chapters 14.3, 14.4
- **Week 15 - (11/28, 11/30) -** Chapters 14.5, 14.6
- **Week 16 - (12/5, 12/7) -** Chapter 14.7, review
- **Finals Exam - (12/12)** 6:00 PM - 8:00 PM in JWB 335.

Policies:

COVID Statement: The COVID-19 guidelines for the University of Utah are adapted often due to the ever-changing status of the pandemic. For the most up-to-date information regarding the campus guidelines, visit https://coronavirus.utah.edu.

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 2 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 Pronouns: I will honor and respect the preferred names and pronouns of students in all aspects of the course, including in class, during office hours, and on assignments.

As an instructor, I am provided with a class roster which lists your legal name, as well as preferred first name if you have indicated one in the Student Profile section of your CIS account. If you would like me to refer to you by a different name, please let me know.

If you need assistance with getting your preferred name printed on your UIDcard, you can visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email bpeacock@sa.utah.edu to schedule an appointment. 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 students ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at 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.

University Counseling Center: The University Counseling Center (UCC) provides developmental, preventive, and therapeutic services and programs that promote the intellectual, emotional, cultural, and social development of University of Utah students. They advocate a philosophy of acceptance, compassion, and support for those they serve, as well as for each other. They aspire to respect cultural, individual and role differences as they continually work toward creating a safe and affirming climate for individuals of all ages, cultures, ethnicities, genders, gender identities, languages, mental and physical abilities, national origins, races, religions, sexual orientations, sizes and socioeconomic statuses.

Office of the Dean of Students: The Office of the Dean of Students is dedicated to being a resource to students through support, advocacy, involvement, and accountability. It serves as a support for students facing challenges to their success as students, and assists with the interpretation of University policy and regulations. Please consider reaching out to the Office of Dean of Students for any questions, issues and concerns. 200 South Central Campus Dr., Suite 270. Monday-Friday 8 am-5 pm.

Student Success Advocates: The mission of Student Success Advocates is to support students in making the most of their University of Utah experience (ssa.utah.edu). They can assist with mentoring, resources, etc. Any student who faces challenges securing their food or housing and believes this may affect their 3 performance in the course is urged to contact a Student Success Advocate for support https://asuu.utah.edu/displaced-students.