MATH 2210 Calculus III, Summer 2020

Class Meetings: This class will be taught asynchronously. There won't be a specific class schedule.
Instructor: Dihan Dai
Email: dai@math.utah.edu
Office Hours: Tuesday/Wednesday/Thursday 2-3 pm
Text: *Calculus with Differential Equations*, by Varberg, Purcell, and Rigdon (9th edition)
For information on purchasing the textbook, go to http://www.math.utah.edu/schedule/bookInfo/

Course Information: Math 2210 Calculus III is a 3 credit course.
Prerequisite Information: "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.

Lecture Notes and Lecture Videos: A full set of lecture videos is available at http://www.math.utah.edu/lectures/. Supplementary notes and videos will be posted on Canvas.
Canvas: Canvas will be used for posting course announcements, homework assignments, grades, files and any relevant supplementary material. You are also welcome to make use if the Canvas discussion board to discuss course problems or topics. You can access the Canvas page through CIS or by logging in at utah.instructure.com. Students should check the Canvas page regularly for course information and resources. Email notifications and correspondence will be sent to the student's UMail address ([u-number]@utah.edu); this email account must be checked regularly.
Grading: The following are the grade components and the percentage each contributes to a student's final grade:

- **Homework Assignments (20%)**- Roughly four textbook sections are due most Fridays at the beginning of class (except for days of exams and the first Friday). The homework will typically cover material covered up to and including the preceding Monday. If you click on a homework assignment in the Assignments tab in Canvas, you will see the list of assigned problems. Three of the problems will be selected for grading by the grader, each graded out of 5 points. There will also be 5 points given for completion. The lowest homework scores will be dropped. Student must submit their homework via Gradescope. To get full credits, students must show all necessary steps to solve the questions.

- **Quizzes (15%)** - A 15-min canvas quiz will be assigned every Wednesday. The quiz will cover relevant topics covered in the previous week's lecture. The lowest quiz scores will be dropped.

- **Midterm Exams (40%, 20% each)**- Two 65-minute midterm exams will be given on selected Fridays. Student will need to finish the exam and submit their work via Gradescope by the due. A practice exam will be posted a week prior to the midterm that will cover the same material. The exam will not be proctored. Students can use their books, notes and a calculator during the exam. Internet resources and collaboration are not allowed and will be treated as cheating. To get full credits, students must show all necessary steps to solve the questions. Dates of the midterm exams are June 12th and July 10th. The times are TBD.

- **Final Exam (25%)**- A two-hour comprehensive exam will be given. As with the midterms, a practice final will be posted a week prior. The exam won't be proctored. Students can use their books, notes and a calculator during the exam. Internet resources and collaboration are not allowed and will be treated as cheating. To get full credits, students must show all necessary steps to solve the questions. The date of the final exam is July 30th. The time is TBD.

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.

Final course letter grades will be determined as follows: If X is your course percentage weighted according to the above, then $\{X \geq 88\% \Rightarrow A, X \geq 85\% \Rightarrow A-, X \geq 82\% \Rightarrow B+, X \geq 73\% \Rightarrow B, X \geq 70\% \Rightarrow B-, X \geq 67\% \Rightarrow C+, X \geq 58\% \Rightarrow C, X \geq 55\% \Rightarrow C-, X \geq 52\% \Rightarrow D+, X \geq 43\% \Rightarrow D, X \geq 40\% \Rightarrow D-, X < 40\% \Rightarrow E\}$.

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.

Expected Learning 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.

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, 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 Personal Pronouns: Class rosters are provided to the instructor with the students 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 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 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.

Course Roadmap Week-by-Week: Below is an outline of the sections and topic covered in this course.

Week 1 Introduction, Chapters 10.4, 11.1-11.3

Week 2 Chapters 11.4-11.7 **Note, Wednesday May 20 is the last day to drop**

Week 3 Chapters 11.8-11.9, 12.1-12.2

Week 4 Chapters 12.3-12.6

Week 5 Chapters 12.7 review, Exam 1 (Jun. 12)

Week 6 Chapters 12.8-12.9, 13.1 **Note, Friday June 19 is the last day to withdraw**

Week 7 Chapter 13.2-13.4

Week 8 Chapters 13.5-13.7

Week 9 Chapters 13.8 review, Exam 2 (Jul. 10)

Week 10 Chapters 13.9, 14.1-14.2

Week 11 Chapters 14.3-14.6

Week 12 Chapter 14.7, review, Final Exam Thursday July 30 from 10:30am-12:30pm.