MATH 2210-005, Spring 2020

Schedule and Classroom: TTh 6:00PM-7:30PM LCB 225

Instructor: Nat Smale Office: LCB 203, email: smale@math.utah.edu Phone: 801-581-7921

Office Hours: Tuesday, Thursday 4:30PM-5:30PM or by appointment.

Prerequisite: At least a C grade in Math 1220 or Math 1250 or Math 1320, or an AP Calculus BC score of at least a 4 (within the last two years).

Text: Calculus with Differential Equations, 9th ed. by Varberg, Purcell and Rigdon. ISBN: 0-13-230633-6. For information on buying the text at a reasonable price (cheaper than the campus bookstore), go to the website www.math.utah.edu/schedule/“Book Information” and click on the link for Math 2210 book purchasing information. There are a number of options outlined.

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. This is roughly covered in chapters 11 thru 14 of the text.

Course Materials and Canvas: Announcements, review problems, exam solutions, reading assignments etc... will be posted on the class Canvas page, and you should check this frequently. Go to the main University of Utah website page www.utah.edu. Login using the same student id and password that you use for the Campus Information System. Each week I will post an outline of what material will be covered during the week, and what sections of the text to read and some
suggested exercises in the text (not to be turned in). There are also online lecture videos available. These can be found by going to the Math department’s home page www.math.utah.edu and clicking on the link Lecture Videos. I will also post grades on Canvas.

**Homework:** Homework problems will be assigned each week using the Math Department's online program WeBWorK. This can be accessed on the course Canvas page. The lowest two homework scores will be dropped.

**Exams and Quizzes:** There will be two midterm exams, on Thursday February 13th and Thursday April 2nd. The final exam is comprehensive and on Thursday, April 23rd from 6PM-8PM. For the midterms, I will let you know a week before each exam, what material will be covered. Exams will be closed book, however, you will be allowed one side of one 8.5"by 11" sheet of notes for the midterm exams and two sides of one sheet of paper for the final exam. Partly because of the vast differences in calculators and to simplify things, **calculators and other electronic devices (including cell phones) will not be allowed on exams.** There will also be weekly quizzes (15 minutes) on Thursdays, except for the weeks of the exams and the weeks after exams. The material on the weekly quizzes will be announced on Canvas. The lowest midterm exam will count 15% of the grade and the highest, 25%. The lowest 2 quizzes will be dropped.

**Grading:** The grade will be computed as follows:

- Quizzes (drop lowest 2) 10%
- WeBWorK Assignments (drop lowest 2) 20%
- Lowest Midterm 15%
- Highest Midterm 25%
- Final Exam 30%

**Expected Learning Outcomes:** Upon successful completion of the
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 on 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 functions 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 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.

**Tutoring:** There is free tutoring in the Math Center (downstairs in between JWB and LCB) Monday through Thursday from 8AM to 8PM and on Friday from 8AM to 6PM. For private tutoring, you can check the University Tutoring Services, 330 SSB. Also, there is a list of tutors
at the Math Department Office, JWB 233.

**Computer Lab:** Also in the Math Center, Room 155C. Link to computer lab is http://www.math.utah.edu/ugrad/lab.html

**Grading Scale:** The grading scale is not determined beforehand, as I usually grade, at least to some extent on a curve. It often ends up being close to the following (but likely will be a couple of points up or down from this): A (90-100), A- (86-89), B+ (81-86), B (76-80), B- (71-75), C+ (66-71), C (60-65), C- (55-61), D (45-54), E (0-44).

**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 Services (CDS), 162 Olpin Union Building, (801)-581-5020. CDS will work with us to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to CDS.

**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