

Mathematics 2210

Summer, 2020

Instructor: Rebecca Hardenbrook
she/they pronouns
preferred name/address: Rebecca

Class Mission Statement: This is a kind, inclusive, and failure-tolerant classroom.

Class Time and Place: 9:30 a.m. - 1:30 p.m.
Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays via
Zoom (see Zoom link in the Canvas home page)

Office Hours: Monday through Friday 8:50 to 9:20 a.m. (via Zoom, if requested)
or right after class or by appointment.

Office Location: JWB 226

E-mail address: rebeccah@math.utah.edu

Text: (1) *Calculus with Differential Equations*, 9th edition, by Varberg,
Purcell and Rigdon. ISBN: 0-13-230633-6

(2) My class notes which will be posted in Canvas. You will need to either print those out, download them to your tablet/iPad or have them handy to refer to during class, because I'll refer to them regularly.

Course Information: Math 2210, Calculus 3 is a 3-credit semester course.

Prerequisite: At least a C grade in Math 1220 or Math 1250 or Math 1320, or AP Calculus BC score of at least 4 (within the last two years)
Important Note: The mathematics department DOES enforce prerequisites for all our undergraduate courses. If you were able to register for this class based on your enrollment in the prerequisite course last semester, and you did not receive the minimum grade in that course to continue on with your math classes, then you will be dropped from this class on Friday of the first week of classes. If that is the case for you, then it is in your best interest to drop yourself from this class before you are forcibly dropped and get into a class for which you have the prerequisites.

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.

Expected Learning Outcomes:

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

- Compute dot and cross products of two vectors, projection of one vector onto another vector.
- Convert between cylindrical, rectangular and spherical coordinates.
- Determine the equation of a plane in 3-d, including a tangent plane to a surface in 3-d.
- Find the parametric equations of a line in 3-d.
- Perform calculus operations on functions of several variables, including limits, partial derivatives, directional derivatives, and gradients; understand what the gradient means geometrically.
- Find maxima and minima of a function of two variables; use Lagrange Multipliers for constrained optimization problems.
- Compute double and triple integrals in rectangular, spherical and cylindrical coordinates; properly use double or triple integrals to find surface area or volume of a 3-d region.
- Compute line and surface integrals.

Additional Learning Outcomes (for this particular course instructor):

- Collaborate, analyze and address mathematical problems with colleagues.
- Articulate and discuss mathematical ideas, via written, oral and/or video expression.
- Engage in diverse problem-solving with other classmates.
- Expand your knowledge, skills and attitudes about how mathematics can prepare you to be global citizens.

Tutoring Lab:

T. Benny Rushing Mathematics Student Center (adjacent to JWB and LCB), Room 155 (**Open by the fourth day of summer semester.) M - Th 8 a.m. - 8 p.m. and F 8 a.m. - 6 p.m.
The tutoring is happening online right now:
<https://utah.instructure.com/courses/613503/>

Private Tutoring:

University Tutoring Services, Marriott Library (they offer inexpensive tutoring). There is also a list of tutors at the Math Department office in JWB 233.

Grading:

The grades will be calculated as follows:

Daily Quizzes	20%
Attendance and participation	5%
Breakout room leader	5%
Midterm	20%
Midterm	20%
Midterm	5%
Final Exam	25%

Note: There will be 3 midterms. Your lowest midterm score will count for 5% of your grade and your top two midterm scores will each count for 20% of your final grade.

Course Structure Overview (adapted from Kelly MacArthur):

There is much research to date regarding active-learning classrooms in STEM courses, at the collegiate level, that suggests strongly that active-learning classrooms can provide a more equitable class, particularly for typically underserved students, including womxn, students of color and first-generation students. The research I've read, as well as many conversations I have had with experienced educators, also is suggestive that no one is not well-served in this way. In other words, an active-learning classroom, statistically, serves students much better than traditional lecture courses. Compared to a traditional lecture format, literally any amount of active, engaged learning that happens in class is better, for STEM courses. Much research continues to prove that claim. Due to this research and the mentoring I have received from many educators, our class will be one where you are doing mathematics every day in class, not just copying down what I write.

(Note: womxn is spelled that way intentionally, to include cis-women, trans-women, women of color, Native women, etc. It's intended to be an inclusive term.)

Growth Mindset, Making Mistakes and Failure (adapted from Kelly MacArthur):

The best mathematicians, engineers and scientists fail big and fail often. I will kindly challenge you in class and will push you into perhaps an uncomfortable zone with the intention of helping you grow mathematically. Sometimes you'll be able to solve the problems we are working on and sometimes you won't. Sometimes you'll be able to solve the problems on your own and other times, you'll need the support of your class colleagues to get the work done. This is the nature of doing mathematics. I ask that you do not get discouraged by this process and instead choose to adopt a growth mindset by actively focusing on your own growth and improvement. As a professor once said to me: mathematics is not a passive activity. Instead, understanding mathematics requires persistent effort and work.

Student Rights in a Mathematics Classroom:

Every student in this class has a right to

- (1) be confused,
- (2) claim a mistake,
- (3) speak, listen and be heard, and
- (4) write, do, and represent only what makes sense.

(These student rights are taken from Kalinec-Craig, C. A. (2017). The Rights of the Learner: A Framework for Promoting Equity through Formative Assessment in Mathematics Education. *Democracy and Education*, 25 (2), Article 5. Available at: <https://democracyeducationjournal.org/cgi/viewcontent.cgi?article=1298&context=home>)

Suggested Homework:

There are suggested homework problems assigned for each section of the book that we cover. You can access that list of problems in Canvas. It is important to do at least some of the homework problems even though I will not collect the homework. These problems are provided for you to practice, and maximize your success in the course. This practice is the best way to be prepared for the daily quizzes and weekly exams.

Attendance & Participation:

Students will be expected to attend all classes in Zoom for this summer online intense course. This is such a shortened course that there really isn't a way to succeed in the course without full involvement on a daily basis. Also, your quizzes will be group quizzes and as such your group mates need to know that they can count on you and you will likely want to be there for your group, to learn from and contribute learning to the group. If there is a compelling reason that you cannot attend class one day, please email me.

Breakout Room Leader:

All students will take 1-3 turns (depending on how many students we have total in the class) being the breakout room leader in the zoom classes. When you are the assigned breakout room leader, you need to take the initiative to lead the discussion about whatever math problem or question we're working on. This does NOT mean you have to know what you're doing with the math, only that you're the one leading the discussion and showing the whiteboard or tablet on your shared screen and possibly also being the scribe.

Quizzes:

There will be a total of 13 quizzes. Basically, there will be a 20-minute quiz every Monday, Tuesday, Wednesday and Thursday, with the exception of any school holidays. The daily quiz will cover the material presented the previous day in class. Quiz questions will be taken from text examples, class examples, assigned problems or problems very much like those problems. **I will drop your lowest three quiz scores.**

Midterm Exams:

There will be a midterm exam every Friday for the first three weeks of class. I will announce in class every Thursday exactly which sections will be covered on the midterm. They will occur in our normal class, split between two one-hour blocks, to accommodate a group portion and solo portion of each midterm exam. Groups will be assigned semi-randomly by me.

Final Exam:

The final exam for this class is comprehensive and it will occur on the Thursday during the last week of class. It will take about two to three hours and will cover all the material covered in the class with an emphasis on the last week's assignments.

Online Grades:

I will put your grades online on Canvas. You can get there easily from the main University of Utah website www.utah.edu. To log in, you use the same student ID and password that you use for Campus Information System. I do my best to update the grades on a regular basis and keep everything accurate. However, I would advise you to check your grades often to make sure there were no data entry mistakes. I'm always happy to correct any mistakes I've made. You just need to let me know about them.

Calculators:

You may find it helpful to have a graphing calculator for your own personal use. However, if I allow calculators on exams or quizzes, I will only allow scientific calculators (no graphing or programmable calculators will be allowed ever). Most of the time, you will not have use of a calculator on exams and quizzes. This will be discussed more in class with each quiz and test.

Grading Scale:

Although I'm not completely opposed to curving grades, I find it's rarely necessary and often harms more than helps. The grade scale will be the usual: A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62), E (0-59).

If I do need to curve the grades, I will simply shift everything down by a few points (whatever is necessary).

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 (CDA), 162 Olpin Union Building, 581-5020 (V/TDD). CDA will work with you and me to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to CDA.

Veterans Center:

If you are a student veteran, the U of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M-F 8-5pm. 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 for any reason.

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>

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).

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 or 801-581-7776.

Dean of Students Office:

The Dean of Students Office is dedicated to being a resource for student through support, advocacy, involvement, and accountability. It serves as a support for students facing challenges to their success as students, and assist with the interpretation of university policy and regulations. Please consider reaching out to the Office of the Dean of Students for any questions, issues and concerns. <http://deanofstudents.utah.edu/> or 801-581-7066.

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.

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. If you need assistance getting your preferred name on your U-ID card, 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.

Teaching Philosophy:

My job as your instructor is not only to provide you with information of mathematical tools that will help you in your future studies and careers but is also to advocate for your learning. I believe that the most positive way that I can advocate for you while I am in the classroom is to constantly remind you the mathematics is not purely analytical. Rather, it requires a great amount of courage, imagination, and creativity. The beauty of mathematics can only be seen when one recognizes that the field is one of art, philosophy, science, and lived experience which we use to understand the natural and man-made issues which most affect us. I am most concerned with your learning and growth process in this course, not with your ability to memorize equations. The ability to solve problems is crucial no matter what you wish to do in your future, and I hope to promote your own innate sense of curiosity to solve these problems.

Classroom Social Equity: I strive to be ethical, kind, fair, inclusive and respectful in my classroom and expect students to behave likewise. In this regard, I have these requests of you, my student:

1. Please do tell me if you have any sort of anxiety disorder, TBI, PTSD, C-PTSD, or any other challenge that would cause psychological harm to you by me calling on you in class. I want students to feel a little uncomfortable and stretched during class, while working on problems as a large group, but I definitely don't want to cause any human being harm. I will hand out a "getting to know you" type assignment on the first day of class which will give you space to do this.
2. If your preferred name is different than your legal first/last name (the preferred name you chose does indeed show up in CIS on my roll sheet, but not yet in Canvas), please let me know (possibly also on the "getting to know you" assignment). It also helps if you log into Canvas and go to Account (on the far left) → Settings and change your Display Name to be the name you prefer to be addressed by.

3. If there is ever a time that you feel this course or the curriculum is not equitable, please email me or meet with me to discuss your concerns so I have a chance to address that.

Additional Policies: From experience, I have decided to make some additional policies regarding my classroom administration and grading.

- Cell phones should be put away during class. If there is an emergency situation, let me know. If you need to use your phone during class, please leave the classroom.
- There will be no retakes of exams, for any reason.
- If you have crisis-level extenuating circumstances which require an alternate exam, it is completely your responsibility to communicate with me as soon as possible so I can help you in some manner. The longer you wait to communicate with me, the less I can and am willing to do to help. I reserve the right to make alternate exams more difficult than the scheduled exam. I only give alternate exams EARLY, never late.
- I will kindly demand respectful behavior in my classroom.
- There will be no cursing nor negative ranting (for example, “math sucks”) on any written work turned in. The penalty for such things on written work will be a zero score on that assignment or test.
- If you have questions about any exam/quiz/homework grade, or you want to appeal the grading of the exam/quiz/homework, you must bring it to me within a week of it being returned. I'm happy to look it over with you, answer any questions you have, and fix any grading issues when appropriate.
- Please make sure you do your best throughout the semester, knowing the grading scheme and what's expected of you, and come talk to me if you need further study strategies. I am happy to brainstorm ideas to help you maximize your study strategies and improve your mathematical understanding. Extra credit is available on each exam, but no extra credit will be offered at the end of the semester. Please talk with me early on about any concerns with your grade.
- I would advise you to set your notifications in Canvas so you are always up-to-date with information on Canvas. I will post weekly announcements in Canvas, and I will hold you accountable for the information contained in those announcements.
- I keep all the grades in Canvas. There are rare occasions when I or one of my graders makes a data entry error, an arithmetic error or some other unintentional mistake in Canvas grades. Please take responsibility to check your grades in Canvas often and report any mistakes to me as soon as you see them. I'm happy to fix them immediately! Additionally, please keep all written work returned to you, including homework, tests,

quizzes, etc. If there is some mistake in Canvas, I will need your written work to fix the error. It is your responsibility as a student to keep that written work.

- Please make sure you do your best throughout the semester, knowing the grading scheme and what's expected of you, and come talk to me if you need further study strategies. I will be happy to brainstorm ideas to help you maximize your study strategies and improve your mathematical understanding. I will offer an extra credit opportunity on every midterm and final exam, to help make up for arithmetic mistakes. I will not offer any additional extra credit at the end of the semester or any other way for you to improve your grade at that time. No exceptions. Please respect this and do not ask for special favors or extra credit when you realize you don't like your grade. Emails at the end of the semester (or anytime really) asking to change your grade or offer you late options of extra credit are disrespectful, in my opinion, and unethical. I will either NOT respond to your email or I will forward your email request to the Dean of Students office for them to meet with you and counsel you on appropriate student behavior.
- If you cheat on any homework, project, quiz or exam, I will automatically give you a zero for that grade. Depending on the severity of the cheating, I may decide to fail you from the class. Please note that the use (or even just pulling it out of your pocket) of a cell phone or any other electronic device is considered cheating and cause for receiving an automatic zero on any in-class exam. Also, if you exhibit any other behaviors that are unethical, like offering me a bribe to give you a better grade (even if you later claim you were joking), I will report your behavior to the Dean of Students.
- I often know students who take my classes, most often because I am a recent undergraduate alumna of the University of Utah or because I am involved with various student groups across campus (I am a graduate student). Please do not hesitate to ask me questions about how to access resources or to get involved on our campus that may be outside of the scope of this course. However, I ask that you respect student-educator boundaries and recognize that I am your instructor.

I reserve the right to change my policies stated in this syllabus at some point in the semester. If I do make a change to a policy, I will announce it in class and send the change in email or post an Announcement on Canvas.