

Mathematics 2210

**For both sections 02 (taught at 8:35) and 06 (taught at 9:40)
Spring, 2019**

Instructor: Kelly A. MacArthur
she/her/hers pronouns
preferred name/address: Kelly

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

Class Time and Place:

<u>Section 02 (8:35 class):</u> 8:35-9:25 am Mondays, Wednesdays, and Fridays in JTB 140	<u>Section 06 (9:40 class):</u> 9:40-10:30 am Mondays, Wednesdays, and Fridays in JTB 130
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Office Hours: Wednesdays 11:00 am- 12:00 pm, Fridays 3:00-4:00 pm, or by appointment.

Weekly Review Sessions: TA-led, Thursdays, 2:00-2:50 pm, GC 1570
TA-led, Fridays, 11:50 am-12:40 pm, GC 1570
Student-led, Saturdays, 10:00 am-1:00 pm, M LIB 1725

Office Location: JWB 218

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

Class Web Page: <http://www.math.utah.edu/~macarthur> (go to Current Teaching and our class)

Text: (1) *Calculus with Differential Equations*, 9th edition, by Varberg, Purcell and Rigdon. ISBN: 0-13-230633-6
Please go to <http://www.math.utah.edu/schedule/bookInfo/index.html> and look at the Book Purchasing Information document for Math1210/1220/2210 to get the best deals.

(2) My class notes which will be posted on the class web page. You will need to print those out and bring them to class, because I'll refer to them regularly. (Please note: You can print them in the Math Computer Lab for no cost.)

Course Information: Math2210, Calculus 3 is a 3-credit semester course.

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: At least a C grade in Math1220 or Math1250 or Math1320, 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.

Expected Learning Outcomes (from the department): 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; proper use of double or triple integrals for finding 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
M - Th 8 a.m. - 8 p.m. and F 8 a.m. - 6 p.m.
(closed Saturdays, Sundays and holidays)
They are also offering group tutoring sessions. If you're interested, inquire at the Tutoring Lab. <http://www.math.utah.edu/ugrad/tutoring.html>

Private Tutoring: University Tutoring Services, 330 SSB (they offer inexpensive tutoring). There is also a list of tutors at the Math Department office in JWB233.

Computer Lab: also in the T. Benny Rushing Mathematics Student Center, Room 155C.
M - Th 8 a.m. - 8 p.m. and F 8 a.m. - 6 p.m.
Link to computer lab is <http://www.math.utah.edu/ugrad/lab.html>

Grading: The grades will be calculated as follows:
Daily Quizzes 10%
Weekly Assignments 15%
Midterm 20%
Midterm 20%
Project 10%
Final Exam 25%

Course Structure Overview: This course is flipped, which means that students are expected to watch a lecture video before class, to get acquainted with the new material. At that point, students are likely still confused about the new mathematics, but they have an introduction to the main ideas. The in-class time then is spent working on or practicing more problems that cover that same content. It's called a flipped structure because we have intentionally flipped where the lecture and first set of practice occurs, compared to a traditional lecture course. There is much research to date regarding flipped classrooms in STEM courses, at the collegiate level, that suggests that flipped 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, and my own experience from teaching with flipped classrooms for many years now, also is suggestive that no one is not well-served in this way. In other words, a flipped classroom, statistically, serves students at least as well as other active-learning strategies, and much better in many instances. 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. A flipped classroom is just one of many active-learning course structure that are helpful for students to learn.

(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.)

Suggested Homework: There are suggested homework problems assigned for each section of the book that we cover. You can access that list of problems at our public class web page. 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 Canvas quizzes and the Weekly Assignments.

Canvas Daily Quizzes: There will be a 30-minute quiz on Canvas that opens every Monday, Wednesday and Friday morning within 30 minutes of class ending that day and closes the next day at the same time (i.e. you have 24 hours to complete each quiz). On exam weeks, you will likely only have one Canvas quiz, instead of three quizzes. You will need to complete each online quiz, outside of class hours. Each daily quiz will be one or two questions about the material covered in class/video lecture that day. If you are keeping up with the work, these quizzes are intended to be reasonably straight forward. There will be a total of about 35-37 of these quizzes. You can get some or all the points back on these quizzes (if you miss points) by following the very specific instructions on the "How to Request Partial Credit for Canvas Daily Quizzes" document that's linked from

the public class web page. **I will drop the lowest eight scores.**

Weekly Assignments: There will be a total of 11 weekly assignments, posted on Canvas (in the Files tab, under the folder Weekly Assignments) by Monday evenings of each non-test week and due the following Monday mornings, by 9:45 am. The weekly assignment will cover the material presented that week in class, that is it will cover the sections covered in the previous Monday through Friday class sessions. Questions will be similar to text examples, class examples, assigned problems or harder conceptual problems. The weekly assignments are intended to be much harder than the daily quizzes, assessing more of your big-picture learning than just one problem. **I will drop your lowest two assignment scores.**

Please take note: the weekly assignments will be turned in via Gradescope. Each student is responsible for uploading their assignment there by the deadline. You can access Gradescope through Canvas. The assignment must follow the printed instructions on the assignment in order to get credit for the assignment.

Late Assignments:

- Each student will be allowed to turn in only three late assignments per semester, regardless of the reason.
- The late assignments will still be uploaded directly to Gradescope following the printed instructions on the assignment, and must be turned in by 11:59 pm on the day the assignment is originally due.
- After you've used up your three late assignments, there will be no further late assignments accepted, under any circumstances. Absolutely no exceptions. I will be consistently strict (and thereby fair) about this policy.

The reason behind this decision is that I believe I have two reasonable options for late work. I could either (a) only accept late assignments based on exceptions, and judge each student's reasons on its own merit, allowing only those reasons that are "good enough" to fit the exception to accept late work. (b) Or I can provide the structure for all students to be able to drop a couple assignments and turn in a few more assignments late, for any reason.

The reasons I don't choose option (a) are many. But the main concern with option (a) is that it disadvantages many students and is incredibly biased. For example, if I have one student who turns in late work because they're sick and has a doctor's note, but another student with late work who is sick but doesn't have access to free or inexpensive medical care and thus has no documentation of their illness, then one student who has documentation of their illness is privileged. Another example is an extroverted student who is willing to explain to me their reasons for turning in a late assignment vs. a private, introverted student who would rather get a zero on their assignment than divulge personal information to me about their reason for having a late assignment. Because of these inequities, I prefer option (b). You are adults and I don't need to be privvy to nor making judgements about your reasons for either missing assignments or turning them in late. For these reasons, I have chosen to

set a structure that drops the lowest two assignment scores for all students and allows everyone to turn in three late assignments for any reason. This decision is intended to be as equitable and accessible as possible for all students, from a variety of backgrounds.

Project: In place of a third midterm exam, I'll assign a project about half way through the semester. It will be due on Wednesday, April 10th. You are welcome to do the project in groups, if you'd like, or solo. I would highly recommend you at least discuss the project problems with other students in class as it's likely that will help you greatly. This will be discussed more in class.

Midterm Exams: There will be two midterm exams throughout the semester, and the dates are fixed, according to the course outline that is on our class web page. They will be during normal class time, in our usual classroom, split between two class periods to accommodate a group portion and solo portion of each exam. Groups will be assigned semi-randomly by me, and put in the People tab in Canvas at least a week before the exam.

Final Exam: The final exam for this class is comprehensive and it will occur as follows.

Section 02 (8:35 class): Wednesday, May 1st, from 8:00 to 10:00 am <i>in our usual classroom.</i>	Section 06 (9:40 class): Thursday, April 25th, from 8:00 to 10:00 am <i>in our usual classroom.</i>
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Exam Review Sessions:

TA-led, Tuesday, 2/5/2019, 11:50 am-12:40 pm, JFB B-1
TA-led, Thursday, 2/7/2019, 2:00-2:50 pm, GC 1570

TA-led, Tuesday, 3/19/2019, 11:50 am-12:40 pm, JFB B-1
TA-led, Thursday, 3/21/2019, 2:00-2:50 pm, GC 1570

Kelly-led, Wednesday, 4/24/2019, 8:30-10:30 am, (room TBA)
Kelly-led, Tuesday, 4/30/2019, 10:00 am-12:00 pm. (room TBA)

Grading Scale: Although I'm not philosophically opposed to curving grades, I find it's rarely necessary. 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).

Online Grades: I will put your grades online on Canvas. These will be kept up-to-date on a weekly basis. 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 likely, you will not have use of a calculator on any exams. This will be discussed more in class.
- 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.

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 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.

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:

1. Please do tell me, discreetly, 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 or small group, but I definitely don't want to cause any human being harm. So, please discreetly tell me if that is the case for you and I will confidentially accommodate your request.
2. If your preferred name is different than your legal first name (*the preferred name you chose does indeed show up in CIS on my roll sheet, but not yet in Canvas*), please log into Canvas and go to Account (on far left)-->Settings and change your Display Name to be the name you prefer to be addressed by. This will help me greatly to know students' names, and to address you correctly when responding to Canvas quiz comments.
3. If there is ever a time that you feel this course or the curriculum is not equitable, please email me, interrupt me in class on the spot, or meet with me to discuss your concerns so I have a chance to address that.

Teaching Philosophy: I believe strongly that mathematics, at its core, is the art/experience/science of problem solving and pattern recognition. It is inherently a creative process, one to be struggled with, repeated, and enjoyed. The process requires imagination, persistence, courage, processing time, and ultimately produces experiential, mathematical skill. It is from this perspective that I teach. I'm not as concerned with the destination, i.e. the answer, as I am about the journey of problem-solving and mathematical exploration since it is exactly the entirety of the journey that creates the answer. And, self-confidence and mastery are then natural by-products of the mathematical journey.

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

- I do not allow the use of laptop computers (where the screen is perpendicular to the desk) in my classroom, in order to minimize student distractions. At this point, it's almost impossible to type notes for a math class on a laptop in real time. Thus, it is unnecessary in class. If you are using a tablet or ipad or some similar device to take notes and the screen lies parallel to your desk, that is totally fine.

- There will be no retakes of exams, for any reason.
- If you have an emergent, extenuating circumstance that makes it necessary to take an alternate exam, it is your responsibility to discuss that with me, before the exam occurs, or as soon as possible. In general, I allow exams to be taken early, but not late.
- If you have crisis-level extenuating circumstances which affect your class performance and you need guidance/advice/ideas, please communicate with me as soon as possible so I can help you in some manner, which I'm truly happy to do. The longer you wait to communicate with me, the less I can and am willing to do to help.
- I will provide and expect respectful behavior in my classroom. Examples of disrespect include, but are not limited to, reading a newspaper or magazine in class, social chatting with your friend in class, text-messaging during class, excessive use of your cell phone, or cuddling someone else in class. If you choose to be disrespectful with distracting behavior during our class, please keep in mind that you put me in a position of choosing between protecting/taking a stand for you OR for the other students or myself whom you are disrupting. I can guarantee I will choose to stand for the students who are there to learn without disruptions and I will thus take action to terminate your distracting behavior, and that action may not be desirable for you.
- There shall be no cursing nor negative ranting (for example, "math sucks") on any written work turned in, as it's unprofessional behavior. The penalty for such things on your written work will be a zero score on that assignment or test.
- I will regularly post announcements to the class in Canvas and will hold you accountable for receiving that information. Be sure to turn on your notifications in Canvas so you are alerted to announcements I make in Canvas as well as grade changes, discussion posts, etc.
- If you have questions about any exam/assignment grade, or you want to appeal the grading of the exam/assignment, you must turn it in to me within one week of the exam/assignment being turned back in class. I'm happy to look over your appeal and/or questions and give my feedback in order to benefit your learning. But, it must be done in this timeframe of a week from when I hand back the exam/assignment.
- 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 during any in-class exam is considered cheating and cause for receiving an automatic zero. 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.
- 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 or math grammar mistakes for which you lost points. But,

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. Please respect this and do not ask for special favors or extra credit or some way to get a higher grade (however you want to word it) when you realize you don't like your grade. Your need to get into a certain program, or needing a specific grade for your work or scholarship or not wanting to upset whomever is paying for your college are all your own personal dilemmas that are truly independent from how I assign grades. The only way to "better your grade" at the end of the semester is to retrieve your final exam, compare it to the solutions, and see if you have any grading appeals. If you do have grading appeals on the final exam, please turn it in to me. I'm happy to look over those and possibly give points back, if it's warranted. Other than that, I consider it disrespectful of me and my time for you to ask for a higher grade than you earned, or for some possible way to increase your grade, at that point.

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 post an Announcement on Canvas about it.