MATH 2210 Calculus III, Spring 2020

Class Meetings: Lecture: MWF at 8:35-9:25 in JTB 140
Instructor: Seungsu Lee, Ph. D candidate in mathematics.
Email: slee@math.utah.edu
Office Hours: Tuesday and Thursday 1:00-2:00 at JWB 306, or by appointment.

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.

Text:


- Class notes which will be posted on our Canvas 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.)

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:

- Daily Quizzes (15%)- There will be 30 to 40-minute quizzes on Canvas that open every Monday, Wednesday and Friday morning at 9:25 a.m. and close the next class day by 8:35 a.m, including exam weeks. For example, Monday’s quizzes close Wednesday morning, Wednesday’s quizzes close on Friday morning and so on. You will need to complete that online quiz on your time, outside of class hours, every week. Each daily quiz will be one to four questions about the material covered in class/video lecture that day. If you are keeping up with the work, these quizzes should be reasonably straightforward. There will be a total of about 35-37 of these quizzes. I will drop the lowest eight scores.

- Weekly Assignments (10%)- 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 8:35 a.m. To turn in the homework, you have to scan the assignment and upload it to Gradescope. 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:

1. Each student will be allowed to turn in only three late assignments per semester, regardless of the reason.
2. The late assignments will be directly uploaded 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.

3. After you have 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.

- **Midterm Exams (50%)**: Three 50-minute midterm exams will be given on selected days. Your lowest midterm score will count for 10% of your grade and your top two midterm scores will each count for 20% of your final grade. You will have the whole class period to complete the exam.

- **Final Exam (25%)**: A two-hour comprehensive exam will be given.

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.

**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 Canvas webpage. 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.

**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. 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 structures that are helpful for students to learn.

Final course letter grades will be determined as follows: If $X$ is your course percentage weighted according to the above, then $\{X \geq 93\% \Rightarrow A, X \geq 90\% \Rightarrow A-, X \geq 87\% \Rightarrow B+, X \geq 83\% \Rightarrow B, X \geq 80\% \Rightarrow B-, X \geq 77\% \Rightarrow C+, X \geq 73\% \Rightarrow C, X \geq 70\% \Rightarrow C-, X \geq 67\% \Rightarrow D+, X \geq 63\% \Rightarrow D, X \geq 60\% \Rightarrow D-, X < 60\% \Rightarrow E\}$.

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.

**Important Dates**: Class will meet every Monday, Wednesday and Friday, however, there will be no class: Monday, January 20th (Martin Luther King Jr. Day), Monday, February 17th (Presidents’ Day) and Sun-Sun, March 8-15 (Spring Break).

- 1st Midterm : Monday, February 3rd.
- 2nd Midterm : Monday, March 2nd.
- 3rd Midterm : Monday, March 30th.
- Final exam : Thursday, April 23rd from 8:00 - 10:00 a.m.
Additional Resources

- **Tutoring Center & Computer Lab**: There is free tutoring in the T. Benny Rushing Mathematics Student Center (room 155, the lower level between JWB and LCB), as well as a computer lab. For more information see http://www.math.utah.edu/undergrad/mathcenter.php

- **Private Tutoring**: University Tutoring Services, 330 SSB. There is also a list of tutors at the math department office JWB 233.

- **Departmental Videos**: The math department has a full set of lecture videos which you are welcome to use to supplement our course material. These can be found at http://www.math.utah.edu/lectures/

**Calculators**: Calculators will not be allowed on exams. They may be used on homework, but you should still write out the details of your computation. It is in your best interest not to become too dependent on your calculator since they will not be allowed on exams.

**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 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 UID 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.

**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.

**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.

- 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 (either on paper or in Gradescope depending on how the assignment/exam was graded) 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 time frame 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.

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.