

Math 2210-003
Calculus III
Spring 2017

General Course Information:

Course: Calculus III, Math 2210-003.

Instructor: Keyvan Yaghmayi.

Office: JWB 107.

Phone: 801-581-8345.

Email: yaghmayi@math.utah.edu.

Class Location: PAB 103.

Class Time: Mondays, Wednesdays, and Fridays 10:45am - 11:35am.

Office Hours: Mondays, Wednesdays, and Fridays after the class 11:40am - 12:30pm or by appointment.

Course Website: I will use the Canvas: <https://gate.acs.utah.edu/>. 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.

Textbook: Calculus, with Differential Equations, by Varberg, Purcell, and Rigdon, 9th edition published by Pearson. ISBN-10: 0132306336 — ISBN-13: 978-0132306331. Before buying the textbook, please read "Calculus Textbook Information" file on Canvas or visit <http://www.math.utah.edu/schedule/bookInfo/>.

Prerequisites: "C" or better in (MATH 1220 OR MATH 1250 OR MATH 1320) OR AP Calculus BC score of at least 4.

Important Dates: The last day to add, drop (delete), elect CR/NC, or audit the class is Friday, January 20. The last day to withdraw is Friday, March 3.

Final Exam: Thursday, April 27 at 10:30am - 12:30pm in our classroom.

This Course:

Course Information: Math 2210 Calculus III is a 3 credit course. The topic of this course is multivariable calculus. In a nutshell, it is the extension of one variable calculus (Calculus I) to several variables.

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:

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 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.

On the website of The Department of Mathematics. there are a complete set of notes and lecture videos for several classes including Calculus III. The notes are compatible with the textbook and I will use them to give the lectures. For Calculus III, you can find them here: <http://www.math.utah.edu/lectures/math2210.html>. You can print the notes in the Math Tutoring Center for no cost (see "Tutoring and Extra Help" below). If you could read these notes ahead and ask your questions in the class, then it would be perfect. Here is the course outline: (We will follow it but subject to circumstances there might be little changes.)

Week	Day	Summary of Plan
Week 1	Monday 1/9	10.4 Parametric Representation of Curves in the Plane
	Wednesday 1/11	11.1 Cartesian Coordinates in Three-Space
	Friday 1/13	11.2 Vectors
Week 2	Monday 1/16	Martin Luther King Jr. Day Holiday
	Wednesday 1/18	11.3 The Dot Product
	Friday 9/4	11.4 The Cross Product; Quiz 1 from 10.4 & 11.1-11.2
Week 3	Monday 1/23	11.5 Vector-Valued Functions and Curvilinear Motion
	Wednesday 1/25	11.6 Lines and Tangent Lines in Three-Space
	Friday 1/27	11.8 Surfaces in Three-Space; Quiz 2 from 11.3-11.4
Week 4	Monday 1/30	11.9 Cylindrical and Spherical Coordinates
	Wednesday 2/1	Review for Midterm 1
	Friday 2/3	Midterm 1 from 10.4 and Chapter 11 (except 11.7)

Week 5	Monday 2/6	12.1 Functions of Two or More Variables
	Wednesday 2/8	12.2 Partial Derivatives
	Friday 2/10	12.3 Limits and Continuity
Week 6	Monday 2/13	12.4 Differentiability
	Wednesday 2/15	12.5 Directional Derivatives and Gradients
	Friday 2/17	12.6 The Chain Rule; Quiz 3 from 12.1-12.3
Week 7	Monday 2/20	Presidents' Day Holiday
	Wednesday 2/22	12.7 Tangent Planes and Approximations
	Friday 2/24	12.8 Maxima and Minima; Quiz 4 from 12.4-12.6
Week 9	Monday 2/27	12.9 The Method of Lagrange Multipliers
	Wednesday 3/1	Review for midterm 2
	Friday 3/3	Midterm 2 from Chapter 12
Week 10	Monday 3/6	13.1 Double Integrals over Rectangles
	Wednesday 3/8	13.2 Iterated Integrals
	Friday 3/10	13.3 Double Integrals over Nonrectangular Regions
Spring Break Dig a hole in the backyard and bury the textbook. Then go out and play.		
Week 11	Monday 3/20	13.4 Double Integrals in Polar Coordinates
	Wednesday 3/22	13.6 Surface Area; Quiz 5 from 13.1-13.3
	Friday 3/24	13.7 Triple Integrals in Cartesian Coordinates
Week 12	Monday 3/27	13.8 Triple Integrals in Cylindrical/Spherical Coordinates
	Wednesday 3/29	13.9 Change of Variables in Multiple Integrals
	Friday 3/31	More Examples on 13.8 & 13.9; Quiz 6 from 13.4 & 13.6-13.7
Week 13	Monday 4/3	Review for Midterm 3
	Wednesday 4/5	Midterm 3 from Chapter 13
	Friday 4/7	14.1 Vector Fields
Week 14	Monday 4/10	14.2 Line Integrals; 14.3 Independence of Path;
	Wednesday 4/12	14.4 Green's Theorem in the Plane; Quiz 7 from 14.1-14.2
	Friday 4/14	
Week 15	Monday 4/17	14.5 Surface Integrals
	Wednesday 4/19	14.6 Gauss's Divergence Theorem
	Friday 4/21	14.7 Stokes's Theorem
Week 16	Monday 4/24	Review for the Final Exam
	Thursday 4/27	Final Exam 10:30 - 12:30

Homework:

You will be assigned some homework problems from the book. Homework problems and due dates will be posted on Canvas regularly. I encourage you to discuss your homework problems with one another, ask help from instructors in the tutoring center, or stop by at office hours. Be sure that the final copy you hand in is written entirely with your words as you understand the solution. If you spend enough time on the homework to gain understanding, then the exams would be easy for you! Late assignments will not be accepted and if you will be absent

the day that an assignment is due you must turn it in to me before the class in which it is due. Homework problems will be graded and returned to you.

Quizzes:

There will be 7 (group) quizzes on the material that already has been taught and covered by homework assignments. You can see the dates in the table above. It should take approximately 15 minutes to complete the quiz. I will upload the solutions and grades on canvas. Quizzes will not be excused due to absences or lateness so please be prompt and present. At the end of the semester, your lowest quiz score will be dropped and will not count toward your overall grade.

I like that you take some quizzes as “group quiz” where you make groups of 3 or 4 with friends/neighbors in class and you discuss problems and your possible answers within the group. Then you write your answer based on your own understanding and in your own words. In group quizzes, I encourage everyone to join and contribute to groups, however, it is fine if someone likes to work individually.

Tests:

There will be three midterms along with a comprehensive final exam. All of them are in the scheduled classroom (PAB 103) and at the class time.

Midterm one: Friday, February 3 (from 10.4 and Chapter 11 except 11.7)

Midterm two: Friday, March 3 (from Chapter 12)

Midterm three: Wednesday, April 5 (from Chapter 13 except 13.5)

Final exam: Thursday, August 27 (comprehensive)

It is essential that you show all your work. Credit will not be given without the proper work and partial credit will be awarded if you show correct steps even if you do not obtain the final correct number!

Grading:

The grades will be calculated as follows:

Homework 10%

Quizzes 15%

Midterm one 15%

Midterm two 15%

Midterm three 15%

Final Exam 30%

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).

Some Policies/Comments:

- Unless specifically noted, no calculators will be allowed during tests or quizzes. It is recommended that you complete your homework without calculators and then check your answers by calculators (or any other preferred technology).
- Cheating will not be tolerated at any time during this course. Any student found cheating will receive a zero for the assignment or test on which the cheating occurred.
- Please staple your homework! Otherwise, I am not responsible for lost papers.
- Regular attendance is encouraged, but is not required!
- If you have any questions, ideas, or suggestion, please feel free to contact me. I promise to do everything in my power to help.
- If there is something that I want to inform you, I will reach you by your email. That is usually your default UMail address (uNID@utah.edu) that you have in the CIS. If you are using other emails more frequently than your UMail, then you can set your UMail to forward to your preferred email address. Also the fastest way to reach me is my email: yaghmayi@math.utah.edu.
- 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) then 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.

Tutoring and Extra Help:

- **Tutoring Lab:** The math tutoring center is available free of charge to all university students. It is located in room 155 of the T. Benny Rushing Mathematics Center (adjacent to the LCB and JWB). The tutoring center is open Monday-Thursday 8:00am-8:00pm, and Friday 8:00am-6:00pm. Please take advantage of the tutoring center as needed throughout the semester. They are also offering group tutoring sessions. If you're interested, inquire at <http://www.math.utah.edu/ugrad/tutoring.html>
- **ASUU Tutoring Center:** University Tutoring Services, 330 SSB. They offer inexpensive tutoring, please see their website: <http://tutoringcenter.utah.edu>
- **The Math Department:** They have put together a complete set of lecture videos for several classes, including Calculus III. You can find them here: <http://www.math.utah.edu/lectures/>
- **Khan Academy:** It is a non-profit, free, educational organization for anyone, anywhere. They have some amazing videos in the Youtube. Check them out: <https://www.khanacademy.org/>

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>

Center for Disability & Access: is dedicated to students with disabilities by providing the opportunity for success and equal access at the University of Utah. They are committed to providing reasonable accommodations as outlined by Federal and State law. The Center for Disability & Access (CDA) also strive to create an inclusive, safe and respectful environment. By promoting awareness, knowledge and equity, they aspire to impact positive change within individuals and the campus community. Please visit <http://disability.utah.edu/> for the latest information.

A.D.A. 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.

Center for Student Wellness: The Center for Student Wellness is your portal for information, resources and solutions for wellness-related issues. Some of their services include: the provision of health information relevant to students most often this includes information on stress, sleep, nutrition and tobacco use; HIV and STD testing; alcohol education and prevention; and making policy recommendations to maintain a healthy learning environment. If they don't have what you are looking for, they will connect you with someone that does. Check out their website for more detailed information: <http://wellness.utah.edu/>

Veterans Support Center: The Center is staffed by student Veterans who are committed to providing their fellow Veterans with the most useful and current information available. The Mission of the Veteran Support Center is to improve and enhance the success of student Veterans; to help them receive the benefits they deserve; to serve as a liaison between the Veteran student community and the University; and to increase their academic success. Additionally to provide an opportunity to continue the relationships built through the service in civilian life. Please see <http://veteranscenter.utah.edu/>

LGBT Resource Center: The LGBT Resource Center provides a comprehensive range of education, information and advocacy services, and works to create and maintain an open, safe, and supportive environment for LGBT students, staff, faculty, alumni, and the entire campus community. Here is their website: <http://lgbt.utah.edu/>

Women's Resource Center: The Womens Resource Center (WRC) at the University of Utah serves as the central resource for educational and support services for women. Honoring the complexities of womens identities, the WRC facilitates choices and changes through programs, counseling, and training grounded in a commitment to advance social justice and equality. <http://womenscenter.utah.edu/>

Disclaimer: All information on this syllabus is subject to change. If any changes on this syllabus, course policies or course outline arise throughout the semester, then I will announce it in class and send the change in email.

Good Luck!