

Syllabus: MATH 2210-003 – Spring 2024

GENERAL DETAILS

Course

- **Course Number and Title:** MATH 2210-003, Calculus III
- **Semester and Year:** Spring 2024
- **Credits:** 3
- **Location:** In-person, Marriott Library 1130
- **Timing:** MWF 10:45-11:35AM
- **Office Hours:** TBD (will be posted on canvas by the end of the first week)

Instructor

- **About:** Abhay Goel (he/they). I am a graduate student interested in number theory.
- **Contact Info:** abhay.goel@utah.edu. I also typically reply quickly via Canvas.
- **Philosophy:** In my experience, mathematics is learned through inquiry, collaboration, and problem-solving; I highly encourage you to ask questions frequently and work with others. To facilitate this, I suggest you attend office hours whenever possible and that you take advantage of the tutoring center and other resources. Feel free to schedule time to chat with me about anything.

COURSE DETAILS

Course Concepts

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.

Prerequisites

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

Course Materials

- **Textbook:** *Calculus with Differential Equations*, by Varberg, Purcell, and Rigdon (9th edition). For details and information on purchasing the textbook, see <http://www.math.utah.edu/resources/bookinfo.php>
- **Other:** The course website is on Canvas.

Technical Requirements

- **Calculator:** You may find it helpful to have a graphing calculator for your own personal use. However, calculators will not be allowed (nor needed) on exams or quizzes.
- **Internet Access:** Needed to access course materials.
- **Scanning Device:** Needed to turn in assignments.

Attendance & Punctuality

Students are expected to attend classes and, if classes are missed, to go through the material covered in class by attending office hours, working with other students, reading the textbook, solving exercises, and thinking about course ideas. For exams, exceptions are made if there are extenuating circumstances.

Learning Support

- **Math Student Center:** <http://www.math.utah.edu/undergraduate/mathcenter.php>
- **Learning Center:** <https://learningcenter.utah.edu/>
- **Video Lectures:** <http://www.math.utah.edu/lectures/math2210.php>
- **Student Success Coaches:** <https://ssc.utah.edu/>

EXPECTED LEARNING OUTCOMES

1. Perform vector computations, including the 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 3d, including a tangent plane to a surface in 3d.
4. Find the parametric equations of a line in 3d.
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, including the use of 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 3d 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.

COURSE DESIGN

Lectures

Classes will primarily consist of lectures with some time to discuss and practice material. Participation is encouraged.

Homework Assignments

Homework will be assigned and submitted weekly on Fridays via Canvas, with a 20% penalty for assignments turned in late, up to the following Monday. Each assignment will consist of approximately ten problems, so I encourage you to try to do two problems per weekday! From each assignment, five chosen problems will be graded out of 4 points each, and 5 points will be awarded for completion (i.e. if each problem is attempted, whether or not it is chosen to be graded).

Quizzes

Weekly one- or two-question quizzes will be given in-class covering course material. Each quiz awards up to two points: one for completion and one for accuracy.

Exams

There will be three exams during the semester each covering one chapter of course material. The final exam will be cumulative and take place at the time specified by the university calendar, with emphasis on material not covered by the previous midterms. Each exam will be accompanied by a practice exam, posted one week in advance. Your lowest midterm exam grade will be replaced by the score on your final exam if this improves your grade.

CLASS SCHEDULE & IMPORTANT DATES

Weekly Breakdown

Homework will be due on Fridays. Here is the tentative schedule of topics:

Week	Dates	Material covered (textbook sections)
1	1/8-1/12	10.4, 11.1
2	1/15-1/19	11.2, 11.3
3	1/22-1/26	11.4, 11.5, 11.6
4	1/29-2/2	11.7, 11.8
5	2/5-2/9	11.9, 12.1
6	2/12-2/16	12.2, 12.3, Exam 1, 12.4
7	2/19-2/23	12.5, 12.6
8	2/26-3/1	12.7, 12.8, 12.9
9	3/11-3/15	13.1, 13.2, 13.3
10	3/18-3/22	13.4, Exam 2, 13.6
11	3/25-3/29	13.7, 13.8, 13.9
12	4/1-4/5	14.1, 14.2
13	4/8-4/12	14.3, Exam 3, 14.4
14	4/15-4/19	14.5, 14.6, 14.7
15	4/22	Final exam review

Important Dates

- **Classes begin:** 1/8
- **Holidays (no class):** 1/15, 2/19, 3/3 – 3/10
- **Exam 1:** 2/14
- **Exam 2:** 3/20
- **Exam 3:** 4/10
- **Last day to add without a permission code:** 1/12
- **Last day to add/drop:** 1/19
- **Last day to withdraw:** 3/1
- **Last day of class:** 4/22
- **Final exam:** 4/29 (10:30-12:30AM)

ASSIGNMENTS, ASSESSMENT, GRADING, & LATE POLICY

Grade Breakdown

Category	Percent of Grade	Adjustments
Homework	25%	Lowest three scores will be dropped.
Quizzes	20%	Two quizzes can be missed.
Exam 1	10%	Lowest exam grade can be replaced with final.
Exam 2	10%	Lowest exam grade can be replaced with final.
Exam 3	10%	Lowest exam grade can be replaced with final.
Final exam	25%	-

Grading Scale

A	[93,100]	B+	[87,90]	C+	[77,80]	D+	[67,70]	E	[0,50)
A-	[90,93)	B	[83,87)	C	[73,77)	D	[60,67)		
		B-	[80,83)	C-	[70,73)	D-	[50,60)		

Regrading Policy

If a grade is recorded incorrectly, it is the student's responsibility to let me know in a timely manner (at the latest within 3 weeks of when the grade was recorded). I'm otherwise happy to discuss the reasoning behind grades on individual assignments by appointment.

Late Policy

The course is designed to provide flexibility if you occasionally cannot turn work in on time by a) allowing assignments to be submitted late at a penalty, and b) dropping a certain number of scores at the end of the semester. In general, you are expected to turn in homework on the due dates. In accordance, I am expected to return graded assignments and otherwise provide feedback to you promptly as well.

Makeup Policy for Exams

For planned absences during exam dates, please inform me 2 weeks ahead of the actual exam date, so that I have time to arrange a makeup exam and you have time to study. If you miss your exam because of illness or another situation which arises suddenly, talk to me as soon as you are aware of your situation and capable to plan for a makeup. If you miss an exam, but it is not due to an extreme situation, also contact me. We will discuss makeup options, but there will be a penalty for taking the exam late.

Extreme Situations: If you have an extraordinary situation, contact me. We can discuss adjustments to the above policies.

Other Grading Policies

For anything not documented here, including CR/NC and incompletes, please refer to the following:

- <https://catalog.utah.edu/#/policy/B12v3LX0G>
- <https://www.finearts.utah.edu/images/A-Guide-to-Incompletes.pdf>

COMMUNICATION

1. For any questions, please first consult this syllabus.
2. All course materials, including assignments, solutions, practice exams, and grades, will be posted on the course Canvas site.
3. Announcements may happen in class, but will also always be done via the Canvas announcements page. You will be responsible for any information contained in them. You are also strongly advised to set up notifications for Canvas so you do not miss any important messages.
4. Feel free to contact me via Canvas or email for questions, I will do my best to answer emails within a weekday. If you have questions whose answer would benefit the entire class, I also encourage you to post it to the Canvas discussion board, as your question may be answered more quickly by other students and even if not, my answer will be available to the entire class. Of course, I encourage you to email me anytime you have a personal inquiry that requires individual attention.

ACADEMIC CODE OF CONDUCT

You are encouraged to review the "Student Code" for the University of Utah: <https://regulations.utah.edu/academics/6-400.php>. In order to ensure that the highest standards of academic conduct are promoted and supported at the University, students must adhere to generally accepted standards of academic honesty, including but not limited to: refraining from cheating, plagiarizing, research misconduct, misrepresenting one's work, and/or inappropriately collaborating. A student who engages in academic misconduct as defined in Part I.B. may be subject to academic sanctions including but not limited to a grade reduction, failing grade, probation, suspension, or dismissal from the program or the University, or revocation of the student's degree or certificate. Sanctions may also include community service, a written reprimand, and/or a written statement of misconduct that can be put into an appropriate record maintained for purposes of the profession or discipline for which the student is preparing.

ADDITIONAL POLICIES AND RESOURCES

Names/Pronouns

Canvas allows students to change the name that is displayed AND allows them to add their pronouns to their Canvas name. I highly recommend doing this. 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, which can be managed at any time). While CIS refers to this as merely a preference, I will refer to you only with the name and pronoun that feels best for you in class or on assignments. Please advise me of any name or pronoun changes so I can help create a learning environment in which you, your name, and your pronouns are respected. If you need any assistance or support, please reach out to the LGBT Resource Center: <https://lgbt.utah.edu/>.

On Equity

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a strength. It is my intent to present materials and activities that are respectful of diversity: age, disability, gender, gender expression, gender identity, national origin, political affiliation, race, religion, sexual orientation, and other unique identities.

I strongly support the axioms of inclusivity put forth by Dr. Federico Ardila:

Axiom 1. Mathematical potential is distributed equally among different groups, irrespective of geographic, demographic, and economic boundaries.

Axiom 2. Everyone can have joyful, meaningful, and empowering mathematical experiences.

Axiom 3. Mathematics is a powerful, malleable tool that can be shaped and used differently by various communities to serve their needs.

Axiom 4. Every student deserves to be treated with dignity and respect.

Discrimination and Harassment

If you or someone you know has been harassed or assaulted, you are asked to report it to the Title IX Coordinator in the Office of Equal Opportunity, Affirmative Action, and Title IX (135 Park Building; 801-581-8365), or the Dean of Students Office (270 Union Building; 801-581-7066). To report to the police, contact the Department of Public Safety (801-585-2677). Please see the Student Bill of Rights, section E (<http://regulations.utah.edu/academics/6-400.php>). I will listen to and believe you if someone is threatening you or someone you know.

The Americans with Disabilities Act

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, <https://disability.utah.edu>. 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, veteran's status, or genetic information. If you or someone you know has been harassed or assaulted on the basis of your sex, including sexual orientation or gender identity/expression, you are encouraged to report it to the University's Title IX Coordinator (Office of Equal Opportunity, Affirmative Action, and Title IX; 135 Park Building; 801-581-8365), or to the Dean of Students Office (270 Union Building; 801-581-7066). For support and confidential consultation, contact the Center for Student Wellness (330 Student Services Building; 801-581-7776). To report to police, contact the Department of Public Safety (801-585-2677).

Campus Safety

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 (801-585-2677). 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 <https://safeu.utah.edu/>.

Privacy Policy

FERPA, the federal law that guards student privacy, prohibits me from discussing your performance in this class with anyone except you without your permission, which must be on file with the university, not simply told to me. To ensure compliance with this law, send e-mail with a university e-mail address or via Canvas mail. Out of respect for the privacy of your classmates, do not record or screenshot any part of this class for use outside of this class, even if you omit identifying information about the speaker or poster. You may not circulate or share images, clips, or other course materials with individuals who are not enrolled in this class. Doing so is a serious violation of our class ethical code and will result in a charge of academic misconduct.

Student Mental Health Resources

Rates of burnout, anxiety, depression, isolation, and loneliness are high among undergraduate students at all U.S. universities, and have noticeably increased during the pandemic. If you need help, campus mental health resources are available: <https://studentaffairs.utah.edu/mental-health-resources/index.php>. This includes counseling, trainings, and other support. If you feel like you need extra support in academics, overcoming personal difficulties, or finding community, then more information about campus resources can be found here: <https://www.utah.edu/students/services.php>.

University Counseling Center

The University Counseling Center (UCC) provides developmental, preventive, and therapeutic services and programs that promote the intellectual, emotional, cultural, and social development of University of Utah students. They advocate a philosophy of acceptance, compassion, and support for those they serve, as well as for each other. They aspire to respect cultural, individual and role differences as they continually work toward creating a safe and affirming climate for individuals of all ages, cultures, ethnicities, genders, gender identities, languages, mental and physical abilities, national origins, races, religions, sexual orientations, sizes, and socioeconomic statuses. More information about the counseling center, including ways to contact them, can be found here: <https://counselingcenter.utah.edu/>.

Syllabus Subject to Change

This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the course schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas.