UCONN
UNIVERSITY OF CONNECTICUT

MATH 2110Q
Multivariable Calculus, Spring 2026

Course and Instructor Information

Course Title: Multivariable Calculus
Credits: 4
Mode/Format: In-person. Meeting dates/times:
- MCHU 307 TuTh 9:30 AM-10:45AM and
- BUSN 215 Fr 9:05 AM - 9:55 AM

Prerequisites: MATH 1132Q or MATH 1152Q or a score of 4 or 5 on the AP Calculus BC exam. Recommended preparation: a grade of C- or better in MATH 1132Q. May not be taken for credit after passing MATH 2130Q or MATH 2143Q. May not be taken out of sequence after passing MATH 2720, 3146, 3160, 3330, 3370, 3410, 3412, 3510, or 3610. Repeat restrictions apply; see advising.uconn.edu/repeat-policy.

Instructor: Jacob Brown (feel free to call me Jake)
Pronouns: He/him
Email: jacob.l.brown@uconn.edu
Office Hours: Mondays 11:30-1 and Wednesdays 10:30-12, or by appointment. Office hours are held in MONT 413.

Course Materials

Required course materials should be obtained before the first day of class.

The textbook for the course is *Multivariable Calculus* by James Stewart (9th edition). You are **not** required to purchase this textbook nor WebAssign for this course (WebAssign will not be used, so especially do not purchase it), but the textbook will likely be helpful as an additional resource.

Required Materials: None

Optional Materials: *Multivariable Calculus* by James Stewart (9th edition)

Course Description

Course Description from Course Catalog: Two- and three-dimensional vector algebra, calculus of functions of several variables, vector differential calculus, line and surface integrals.

Course Objectives

By the end of the course, students should be able to utilize various multi-dimensional coordinate systems including Cartesian, polar, cylindrical, and spherical coordinates, recognize, plot, and interpret equations of curves and surfaces in $\mathbb{R}^3$, compute partial and directional derivatives of scalar-valued and vector-valued multi-variable functions and vector fields, perform optimization using various techniques including Lagrange multipliers, set up and compute double, triple, line, and surface integrals of scalar-valued and vector-valued functions, apply major theorems such as Green's, Stokes', and the Divergence Theorems, and apply mathematical concepts to real-world problems.

Course Requirements and Grading

Summary of Course Grading:

Course Components	Weight
In-class Activities	5%
Homework	15%
Quizzes	10%
Exam 1	20%
Exam 2	25%
Exam 3	25%
Extra Credit (Optional)	Up to 7% extra credit

Final Score	Grade
90-100	A
80-89.99	B
70-79.99	C
60-69.99	D
0-59.99	F

Grades ending in 0-2.99 receive a -
Grades ending in 7-9.99 receive a + (except A)

In-Class Activities

During the last 10-15 minutes of each Tuesday and Thursday lecture, you will complete a think-pair-share (TPS) consisting of a few problems about that lecture's content. TPSs are graded for good-faith completion. During Friday discussions (or an occasional other class day), there will be a group activity in the first 35 minutes of class. Activities are graded for good-faith completion as well.

TPSs are worth 1 point each, and Friday activities are worth 2 points each. There are 50 total points to be earned throughout the semester for this grade category; you are expected to earn 40 for full credit. Points above 40 are not extra credit. If you earn less than 40, your percentage for this category will be computed as: (# points earned)/8. Some examples: 40 points = 5%. 50 points = 5%. 32 points = 4%. 20 points = 2.5%. 0 points = 0%.

Make-ups not allowed for in-class activities. If you miss several classes due to extenuating circumstances, please contact me.

Homework

Weekly homework will be assigned, for a total of 14 assignments. Each assignment will be graded out of 15 points, but there will always be more than 20 points available on each assignment. This gives you leeway to make mistakes/skip problems without hurting your final grade. The maximum grade on any homework is 15/15; points above 15 are not extra credit. Individual problems will be worth 1, 2, or 3 points depending on their difficulty. Partial credit is available.

You must show your work and explain your reasoning to receive full credit. Calculators can be used to simplify tedious arithmetic but should not be used to do more complex calculations, including numerically estimating definite integrals, unless told to do so otherwise. You are also prohibited from asking ChatGPT or using other AI/online resources to solve the assigned problems. See the AI policy under Academic Integrity for more details.

Homework assignments will be graded following the Homework Guidelines posted in HuskyCT. You must abide by the policies in the Guidelines in order to receive full credit for the homework.

All homework assignments are due Sunday at 11:59PM each week (with the exception of HW 14, which will be due on Monday due to Sunday being a reading day). Late homework is generally not accepted unless you have a documented excuse such as illness or a personal/family emergency. See the Late Homework Policy for more information.

Quizzes

During the last 10 minutes of Friday discussion, there will be a quiz based on the previous week's material. Each quiz will be closed-note, no calculators allowed. There will be 11 total quizzes, and your lowest two quiz grades will be dropped at the end of the semester.

You may make up at most **two** missed quizzes without prior approval. Just email me within 24 hours of the quiz date to let me know you need to arrange a make-up. You must take your make-up quiz within the week following the quiz.

Make-up quizzes will be done at the Proctoring Center in MONT 105.

Exams

There will be three exams during the semester, on the following dates, during the Friday discussion:

- Exam 1: Friday, February 20
- Exam 2: Friday, March 27
- Exam 3: Friday, May 1

Exams are 50 minutes, and no calculators are allowed. More information about the format and content of each exam, as well as the allowed tools/materials, will be given in advance of each exam.

The exams will be semi-cumulative in the sense that there will be overlap of topics between exams (for example, Exams 1 and 2 will both cover Chapter 14), but they are not fully cumulative. Of course, math is inherently cumulative, meaning you will need to master the material from earlier chapters to successfully complete the problems of later chapters.

In the event you are sick or have a personal/family emergency on an exam day, you must notify within 24 hours to let me know why you missed the exam and request a make-up. If approved, you must make up the exam in the Proctoring Center during the week following the exam. Note that at most one exam make-up approval will be given to each student. If there are extenuating circumstances that cause you to miss more than one exam, please contact me.

There is no final exam for this course.

Extra Credit

In HuskyCT, you will find Weekly Worksheets, Additional Practice Worksheets, and Practice Exams. These are additional assignments meant to help you learn the course material. You'll also be able to submit exam corrections for extra credit. They are worth the following:

- Weekly Worksheets (Up to 5 points each x 14 weekly worksheets = 70 points).
    - Practice Problems (3 points) - Work on and submit these problems for credit (meant to build your understanding of the material)
    - Extra Quiz Practice (0 points) - These are worth no credit since solutions are provided immediately
    - Challenge Problems (2 points) - Work on and submit for more credit (meant to push you)
- Additional Practice Worksheets (Up to 2 points each x 21 worksheets = 42 points)
    - These worksheets cover individual topics. Complete all problems for credit
- Practice Exams (Up to 5 points each x 3 practice exams = 15 points)
    - Help you prepare for each exam. Complete all problems for credit
- Exam Corrections (Up to 5 points each x 3 exams = 15 points)
    - After each exam, you can submit a correct solution to one of the problems on the exam. You can still take advantage of this opportunity even if you got a perfect score on the exam.

These assignments are graded for **satisfactory completion.** That means you should show your work and complete every problem you are expected to complete, but incorrect answers will not lose points. I will not be commenting on your work on these assignments, so if you would like feedback on them, please come to office hours.

Weekly worksheets are due on Fridays at 11:59PM on HuskyCT. The Additional Practice Worksheets and Practice Exams are due on HuskyCT at 11:59PM on the date of their respective exams (which are also Fridays**)**. These deadlines are **strict;** they do not follow the late policy for homework. If they are not submitted on time, they are 0s.

There are 70+42+15+15=142 points available. Of these, you need to earn 84 to get the full 7% of extra credit. Points beyond 84 do not contribute. If you earn less than 84 points, your percentage of extra credit will be computed as: (# points earned)/12. Some examples: 84 points = 7% extra credit. 100 points = 7% extra credit. 42 points = 3.5% extra credit. 60 points = 5% extra credit. 0 points = 0% extra credit.

Course Policies

Communication: I will frequently send announcements in HuskyCT with important information. It is your responsibility to regularly check the announcements tab to ensure you see my messages.

Make-up Policy: You are expected to submit all assignments by their deadlines and take all quizzes and exams on their scheduled dates. If you are sick or a personal/family emergency arises, contact me as soon as possible, and no later than 24 hours after the assignment deadline or quiz/exam date. As stated above, you are allowed to miss **two** quizzes and **one** midterm exam and be granted a make-up. Make-ups beyond these will generally not be granted unless you have documentation of an extenuating circumstance.

Late Homework Policy: You are expected to turn in every homework assignment by the deadline. However, a homework assignment will not be considered "late" if it is submitted before I finish grading the assignment. For example, the deadline is Sunday at 11:59PM, you submit it at 10:00AM the following Monday morning, and I don't finish grading the assignment until 5:00PM that Monday. Your submission will **not** be considered late. Once I have posted grades for the assignment, however, your assignment is late and will generally not be accepted unless you have documentation of an extenuating circumstance such as illness or a personal/family emergency. Note that this policy only applies to **homework**, not the extra credit assignments which are only graded for satisfactory completion.

Feedback and Grades: I will make every effort to return on-time homework submissions within a week. Quizzes/exams will be returned one week after the quiz/exam date, but not earlier (since some students may need to make up the quiz/exam). Extra credit assignments will be graded one week after their deadlines.

Regrade Requests: Any regrade requests must be made within one week of the grade being released. Regrade requests are only granted for genuine mistakes, such as overlooked work or a correct answer being marked incorrect, not because you simply want more credit. Late requests are considered only under extenuating circumstances.

Weekly Time Commitment: You should expect to dedicate 12 to 16 hours a week to this course. This expectation is based on the various course activities, assignments, and assessments and the University of Connecticut's policy regarding credit hours. (More information related to hours per week per credit can be accessed at the Online Student website)

How to Succeed in this Course

To succeed in this course, you should:

- Attend every lecture and discussion
- Ask questions during class if you are confused
- Work on every assignment well in advance of its deadline
- Study for every quiz and exam
- Seek assistance from your peers, the Q-Center, or my office hours if you need help with a topic

Additional Support

Throughout the semester, it is normal to run into many challenges. I am here to help you with the academic challenges. I encourage you to email me or come to office hours if there is something you are confused about. **I do not judge, shame, or look down on any student who comes to me for help, no matter how big, small, or "silly" the question is.** Outside factors can also raise challenges. It can be difficult to find the balance between using challenges as an opportunity to push yourself and knowing when to take a step back for your personal health and well-being. The following campus offices are here at your service for additional support:

Dean of Students Office, Academic Achievement Center, Writing Center, Quantitative Learning Center, Center for Students with Disabilities, Title IX Office, Student Health and Wellness -- Mental Health

If outside factors are causing you to fall behind, please let me know. You do not need to tell me any details about what is troubling you. Letting me know sooner rather than later gives me more flexibility for supporting your success in this course. Getting help is a smart and courageous thing to do.

Academic Integrity

This course expects all students to act in accordance with the Guidelines for Academic Integrity at the University of Connecticut. UConn defines academic misconduct as "dishonest or unethical academic behavior that includes, but is not limited to, misrepresenting mastery in an academic area (e.g., cheating), failing to properly credit information, research, or ideas to their rightful originators or representing such information, research, or ideas as your own (e.g., plagiarism)."

Copying answers to homework from another person, online sources or AI, or using unauthorized resources during a quiz or exam (such as notes, a cheat sheet, a calculator, communication with another person, using online resources/Chegg/ChatGPT, etc) are examples (but not the only examples) of academic misconduct. Penalties for academic misconduct can range from a 0 on the assignment to an F in the course.

AI Policy: Using AI such as ChatGPT, Google Gemini, Copilot, etc, to solve any assigned problem for you is considered an academic integrity violation and will be subject to the consequences listed above. You are also forbidden from using AI to write or typeset your work, even if you complete the problems on your own. In short, anything you submit for credit in this course must be 100% your own work and 0% AI work.

You are allowed to use AI to help you understand the class material by asking it to explain the concepts, go over examples other than the assigned problems, give you practice problems, etc, but be cautious. AI is not perfect, and is prone to making mistakes (including on many of the problems I have assigned previously!) You should double-check the output from AI to ensure that it is accurate. I will not give points back if you make mistakes because AI told you something incorrect.

Link to the Academic, Scholarly, and Professional Integrity and Misconduct Policy:
https://policy.uconn.edu/2023/07/11/academic-scholarly-and-professional-integrity-and-misconduct-aspim-policy-on/

Resources for Students Experiencing Distress

The University of Connecticut is committed to supporting students in their mental health, their psychological and social well-being, and their connection to their academic experience and overall wellness. The university believes that academic, personal, and professional development can flourish only when each member of our community is assured equitable access to mental health services. The university aims to make access to mental health attainable while fostering a community reflecting equity and diversity and understands that good mental health may lead to personal and professional growth, greater self-awareness, increased social engagement, enhanced academic success, and campus and community involvement. Students who feel they may benefit from speaking with a mental health professional can find support and resources through the **Student Health and Wellness-Mental Health** (SHaW-MH) office. Through SHaW-MH, students can make an appointment with a mental health professional and engage in confidential conversations or seek recommendations or referrals for any mental health or psychological concern. Mental health services are included as part of the university's student health insurance plan and also partially funded through university fees. If you do not have UConn's student health insurance plan, most major insurance plans are also accepted. Students can visit the **Student Health and Wellness-Mental Health located in Storrs on the main campus in the Arjona Building, 4th Floor,** or contact the office at **(860) 486-4705, or https://studenthealth.uconn.edu/** for services or questions**.**

Accommodations for Illness or Extended Absences

Please stay home if you are feeling ill and please go home if you are in class and start to feel ill. If illness prevents you from attending class, it is your responsibility to notify your instructor as soon as possible. You do not need to disclose the nature of your illness, however, you will need to work with your instructor to determine how you will complete coursework during your absence. If life circumstances are affecting your ability to focus on courses and your UConn experience, students can email the Dean of Students at dos@uconn.edu to request support. Regional campus students should email the Student Services staff at their home campus to request support and faculty notification. COVID-19 Specific Information: People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. These symptoms may appear 2-14 days after exposure to the virus and can include:

- Fever,
- Cough,
- Shortness of breath or difficulty breathing
- Chills
- Repeated shaking with chills
- Muscle pain

- Headache
- Sore throat
- New loss of taste or smell

Additional information including what to do if you test positive or you are informed through contract tracing that you were in contact with someone who tested positive, and answers to other important questions can be found here: https://studenthealth.uconn.edu/updates-events/coronavirus/

Students with Disabilities

The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or http://csd.uconn.edu/. Student Athletes and Students with Disabilities should inform your instructor of your commitments as an athlete, any special needs that you have, etc. within the first three weeks of the semester. You will be expected to bring in a letter from the Athletics Department or the Center for Students with Disabilities. The University Senate passed a motion on about religious observances which stipulated that Students anticipating such a conflict should inform their instructor in writing within the first three weeks of the semester, and prior to the anticipated absence, and should take the initiative to work out with the instructor a schedule for making up missed work. For conflicts with final examinations, students should, as usual, contact the Dean of Students.

Minimum Technical Skills

To be successful in this course, you will need the following technical skills:

- Use electronic mail with attachments.
- Save files in commonly used word processing program formats.
- Scan handwritten work to PDFs.
- Copy and paste text, graphics or hyperlinks.
- Work within two or more browser windows simultaneously.
- Open and access PDF files.

Evaluation of Course Experience

Students will be given an opportunity to provide feedback on their course experience and instruction using the University's standard procedures, which are administered by the Office of Institutional Research and Effectiveness (OIRE). The University of Connecticut is dedicated to supporting and enhancing teaching effectiveness and student learning using a variety of methods. The Student Evaluation of Teaching (SET) is just one tool used to help faculty enhance their teaching. The SET is used for both formative (self-improvement) and summative (evaluation) purposes. Additional informal formative surveys and other feedback instruments may be administered within the course.

Course Outline

Below is the plan for what we will cover each week. Of course, unexpected scenarios might require me to modify this outline. I reserve the right to change this plan with reasonable advance notice. Exam dates will not change unless there are truly extraordinary extenuating circumstances (weather closure, campus-wide emergency, etc).

On the back of this page is the assignment deadline schedule. I recommend tearing out this page and keeping it in a safe, accessible location so you can easily reference what we will be covering, what assignments you need to complete, and what topics you need to know for the quizzes/exams each week.

Week	Topics Covered
1	12.1: Three-Dimensional Coordinate Systems 12.2: Vectors 12.3: The Dot Product 12.4: The Cross Product
2	12.5: Equations of Lines and Planes 12.6: Cylinders and Quadric Surfaces
3	14.1: Functions of Several Variables 14.3: Partial Derivatives 14.4: Tangent Planes and Linear Approximation 14.5: The Chain Rule
4	14.6: Directional Derivatives and the Gradient Vector 14.7: Maximum and Minimum Values 14.8: Lagrange Multipliers
5	15.1: Double Integrals over Rectangles 15.2: Double Integrals over General Regions **Exam 1 (Friday, February 20) - Covers Chapters 12 and 14**
6	15.3: Double Integrals in Polar Coordinates 15.6: Triple Integrals in Cartesian Coordinates
7	15.7: Triple Integrals in Cylindrical Coordinates 15.8: Triple Integrals in Spherical Coordinates
8	15.9: Change of Variables in Multiple Integrals
-	Spring Break, no classes
9	13.1: Vector Functions 13.2: Derivatives and Integrals of Vector Functions 13.3: Arc Length **Exam 2 (Friday, March 27) - Covers Chapters 14 and 15**
10	16.2: Line Integrals (Scalar Functions) 16.1: Vector Fields 16.2: Line Integrals (Vector Fields)
11	16.3: The Fundamental Theorem for Line Integrals 16.4: Green's Theorem
12	16.5: Curl and Divergence 16.6: Parametric Surfaces and Their Areas
13	16.7: Surface Integrals 16.8: Stokes' Theorem
14	16.9: Divergence Theorem **Exam 3 (Friday, May 1) - Covers Chapters 15, 13, and 16 (16.9 not included)**
15 (Finals Week)	**No Final Exam**

Assignment Deadline Schedule

Below is a schedule containing all the deadlines for the course, as well as the chapters you should know for each quiz and exam. Of course, the semester can be unpredictable, and deadlines may need to be moved around. I reserve the right to change deadlines with reasonable advance notice. However, I will never move a deadline forward (ie, due earlier), only backward.

To save space, the following abbreviations are used: HW = Homework. WW = Weekly Worksheet. APS = Additional Practice Worksheet. PE = Practice Exam. Remember that the WWs, APSs, and PEs are extra credit and therefore optional.

Week	Assignments Due	Quiz/Exam Topics
1	HW 1 – Sunday, January 25, 11:59PM	Quiz 1 – Calc 1 & 2 Prerequisites
2	WW 1 – Friday, January 30, 11:59PM HW 2 – Sunday, February 1, 11:59PM	Quiz 2 – Ch 12.1-12.4
3	WW 2 – Friday, February 6, 11:59PM HW 3 – Sunday, February 8, 11:59PM	Quiz 3 – Ch 12.5 & 12.6
4	WW 3 – Friday, February 13, 11:59PM HW 4 – Sunday, February 15, 11:59PM	Quiz 4 – Ch 14.1 & 14.3-14.5
5	WW4, APSs for Exam 1, PE 1 – Friday, February 20, 11:59PM HW 5 – Sunday, February 22, 11:59PM	Exam 1 – Ch 12.1-12.6, Ch 14.1, Ch 14.3-14.8
6	WW 5 – Friday, February 27, 11:59PM HW 6 – Sunday, March 1, 11:59PM	Quiz 5 – Ch 15.1 & 15.2
7	WW 6 – Friday, March 6, 11:59PM HW 7 – Sunday, March 8, 11:59PM	Quiz 6 – Ch 15.3 & 15.6
8	WW 7 – Friday, March 13, 11:59PM HW 8 – Sunday, March 15, 11:59PM	Quiz 7 – Ch 15.7 & 15.8
— (Break)	None	None
9	WW 8, APSs for Exam 2, PE 2 – Friday, March 27, 11:59PM HW 9 – Sunday, March 29, 11:59PM	Exam 2 – Ch 14.1, Ch 14.3-14.8, Ch 15.1-15.3, Ch 15.6-15.9
10	WW 9 – Friday, April 3, 11:59PM HW 10 – Sunday, April 5, 11:59PM	Quiz 8 – Ch 13.1-13.3
11	WW 10 – Friday, April 10, 11:59PM HW 11 – Sunday, April 12, 11:59PM	Quiz 9 – Ch 16.1 & 16.2
12	WW 11 – Friday, April 17, 11:59PM HW 12 – Sunday, April 19, 11:59PM	Quiz 10 – Ch 16.3 & 16.4
13	WW 12 – Friday, April 24, 11:59PM HW 13 – Sunday, April 26, 11:59PM	Quiz 11 – Ch 16.5 & 16.6
14	WW 13, APSs for Exam 3, PE 3 – Friday, May 1, 11:59PM HW 14 – Monday, May 4, 11:59PM	Exam 3 – Ch 15.1-15.3, Ch 15.6-15.9, Ch 13.1-13.3, Ch 16.1-16.8
15 (Finals)	WW 14, Remaining APSs – Friday, May 8, 11:59PM	None