Syllabus

Math 2110Q-140 (& disc. 141D-146D): Multivariable Calculus

Spring 2026

Excluding materials for purchase, syllabus information may be subject to change. The most up-to-date syllabus is located within the course in HuskyCT.

I. Course and Instructor Information

From catalog: *MATH 2110Q. Multivariable Calculus. (4 Credits)*

Two- and three-dimensional vector algebra, calculus of functions of several variables, vector differential calculus, line and surface integrals.

Enrollment Requirements: MATH 1132Q (https://catalog.uconn.edu/search/?P=MATH%201132Q) 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 (https://catalog.uconn.edu/search/?P=MATH%201132Q). May not be taken for credit after passing MATH 2130Q or MATH 2143Q (https://catalog.uconn.edu/search/?P=MATH%202143Q). May not be taken out of sequence after passing MATH 2720 (https://catalog.uconn.edu/search/?P=MATH%202720), 3146 (https://catalog.uconn.edu/search/?P=MATH%203146), 3160 (https://catalog.uconn.edu/search/?P=MATH%203160), 3330 (https://catalog.uconn.edu/search/?P=MATH%203330), 3370 (https://catalog.uconn.edu/search/?P=MATH%203370), 3410 (https://catalog.uconn.edu/search/?P=MATH%203410), 3412, 3510 (https://catalog.uconn.edu/search/?P=MATH%203510), or 3610. Repeat restrictions apply; see advising.uconn.edu/repeat-policy.

Skill Codes: COMP: Quantitative Competency

Staff, times, rooms

Role	Name	Lecture / Discussion	Office hours	email

Instructor	Alvaro Lozano-Robledo	**TuTh 2pm-3:15pm AUST 108**	Online Office Hours (https://uconn-cmr.webex.com/meet/all08012) on Mondays 1-2pm, at my Webex Room (https://uconn-cmr.webex.com/meet/all08012) In-Person Office Hours on Thursdays 3:30-4:30pm at MONT 233	alvaro@uconn.edu
Teaching Assistant	Yukta Lodha	https://math.uconn.edu/spring-2026-courses/ (https://math.uconn.edu/spring-2026-courses/)	In-person Office Hours: Friday: 3:00-4:00 PM 📍 MONT 213	yukta.lodha@uconn.edu
Teaching Assistant	Sam Stuart	https://math.uconn.edu/spring-2026-courses/ (https://math.uconn.edu/spring-2026-courses/)	In-Person Office Hours on Wednesdays, 3:00-4:00pm in MONT 213	samuel.stuart@uconn.edu

Office Hours

- You are welcome to **stop by without an appointment at these times**. Office hours are **not** intended for private discussions or tutoring.
- If you are unavailable during these times, feel free to reach out to the respective staff member. We will not be able to provide alternative times on a regular or semi-regular basis and we won't be able to accommodate all requests.

Course communication

Communications from course staff will be made primarily through these channels:

- **HuskyCT Announcements** which are sent to your UConn email automatically and are viewable on a dedicated area in our HuskyCT lecture / discussion section.

- **In class/discussion**. If you have to miss a lecture or discussion, please contact a classmate, your TA or me.
- Automated reminders and grade notifications.

To contact us, either talk to us before/after class, during office hours, or by email.

- When sending an email, please use the following subject line: **[MATH2110-14x] Short, Clear subject (where x completes the number of your section, from 141-146)**
- Why? I need to know what class you're in (MATH2110) and your discussion section (14xD) and this saves me a lot of time.
- Expect a response within 24 hours during normal business hours (this does not include: weekends/holidays/school breaks) and feel free to remind us if a response is delayed.
- Do not use HuskyCT to message your course staff.

II. Course Content

Textbook

Multivariable Calculus by James Stewart (9th Edition) with a WebAssign code for doing online homework.

This book consists of **Chapters 10-17 of Calculus: Early Transcendentals (9th Edition)**.

- if you already have that version from Math 1131Q and/or 1132Q, then you are all set (specifically you will need Chapters 12-16).
- If not, you can buy the textbook from the bookstore, or get a one-term access to Cengage Unlimited (latter includes access to MATH2410Q textbook and former allows to bundle that book).

WebAssign (more information on: https://www.cengage.com/coursepages/UConn_MATH2110) (https://www.cengage.com/coursepages/UConn_MATH2110))

- If you are participating in the Husky Book Bundle, then you should have access.
- If you have opted out of the bundle, then you will be removed from the WebAssign course after the Add/Drop date has passed. To regain access, you'll need to purchase an access code.
- Assignment progress and scores will be saved, whether you continue with paid access or not.

Learning Objectives

By the end of the semester, students should be able to:

1. Use three-dimensional Cartesian coordinates (including vectors and vector operations) to classify and distinguish between common equations and graphs of surfaces and curves.
2. Evaluate first and second partial derivatives of a multivariable function and relate these functions and their values to the behavior of a surface.
3. Use partial derivatives to determine equations of tangent planes, to locate and to classify critical points, and to calculate a rate of change of a surface in any direction.

4. Identify points in two-dimensional (Cartesian and polar) and three-dimensional (Cartesian, cylindrical, and spherical) coordinate systems and express common equations of surfaces and boundaries of regions in each system.
5. Write, reorder, evaluate, and interpret double and triple integrals of regions in the plane and space, respectively.
6. Set up, evaluate, and interpret line integrals of a scalar function or vector field over a given curve, applying famous results like the Fundamental Theorem for Line Integrals and Green's Theorem when appropriate.
7. Set up, evaluate, and interpret surface integrals of a scalar function or vector field over a given surface, applying famous results like Stokes' Theorem and the Divergence Theorem when appropriate.

Calculators: The use of calculators is not allowed on quizzes or exams. You are welcome to use calculators while working on worksheets or WebAssign assignments.

Course Outline (tentative)

Week (Module)	Dates (Mon-Sun)	Section	Topic
1 (Module 1)	Tuesday 1/20-1/25		Friday: Quiz 1 during Discussion
			Course Orientation
		12.1	Three-Dimensional Coordinate Systems
		12.2	Vectors
		12.3	The Dot Product
		12.4	The Cross Product
2 (Module 1)	1/26-2/1		Friday: Quiz 2 during Discussion
		12.5	Equations of Lines and Planes
		12.6	Cylinders and Quadric Surfaces
3 (Module 2)	2/2-2/8		Friday: Quiz 3 during Discussion

		14.1	Functions of Several Variables
		14.3	Partial Derivatives
		14.4	Tangent Planes and Linear Approximation
		14.5	The Chain Rule
4	2/9-2/15		Friday: Quiz 4 during Discussion
		14.6	Directional Derivatives & the Gradient Vector
		14.7	Maximum and Minimum Values
		14.8	Lagrange Multipliers
5 (Module 3)	2/16-2/22	**Exam 1 (during discussion)**	**Friday February 20** – Chapters 12 and 14
		15.1	Double Integrals over Rectangles
		15.2	Double Integrals over General Regions
6	2/23-3/1		Friday: Quiz 5 during Discussion
		15.3	Double Integrals in Polar Coordinates
		15.6	Triple Integrals in Cartesian Coordinates
7	3/2-3/8		Friday: Quiz 6 during Discussion
		15.7	Triple Integrals in Cylindrical Coordinates

		15.8	Triple Integrals in Spherical Coordinates
8	3/9-3/15		Friday: Quiz 7 during Discussion
		15.9	Change of Variables in Multiple Integrals
Spring Break	3/16-3/22	No Class	Spring Break
9 (Module 4)	3/23-3/29	**Exam 2 (during discussion)**	**Friday March 27 – Chapter 15: 15.1-15.3 and 15.6-15.9**
		13.1	Vector Functions
		13.2	Derivatives & Integrals of Vector Functions
		13.3	Arc Length
10 (Module 5)	3/30-4/5		Friday: Quiz 8 during Discussion
		16.2	Line Integrals (Scalar Functions)
		16.1	Vector Fields
		16.2	Line Integrals (Vector Fields)
11	4/6-4/12		Friday: Quiz 9 during Discussion
		16.3	The Fundamental Theorem for Line Integrals
		16.4	Green's Theorem
12 (Module 6)	4/13-4/19		Friday: Quiz 10 during Discussion

		16.5	Curl and Divergence
		16.6	Parametric Surfaces and Their Areas
13	4/20-4/26		Friday: Quiz 11 during Discussion
		16.7	Surface Integrals (Scalar and Vector Functions)
		16.8	Stokes' Theorem
14	4/27-5/3	**Exam 3 (during discussion)**	**Exam 3: Friday May 1 – Ch 13.1-13.3 and 16.1-16.8**
		16.9	Divergence Theorem
Finals	5/4- Saturday 5/9 TBA		

III. Grade

Course Requirements and Grading

The course grade is calculated from grades from the three in-class exams, quizzes, and an optional Practice Problem Points (PPP) which includes the computer-graded WebAssign and additional problems to be submitted on HuskyCT.

Category	**Weight**
Exam 1 (Week 5 discussion)	20%

Exam 2 (Week 9 discussion)	25%
Exam 3 (Week 14 discussion)	25%
Quizzes (best 8 out of 10) / Honors Assignments	15%
WebAssign	15%
Total of items above	100%
Extra Credit *Worksheets, Practice Exams, Exam Correction*	7%

Important notes on grading

- Letter grade conversion is according to UConn's Undergraduate Letter Scale (https://registrar.uconn.edu/grades/).
- There will be no additional graded components.
- Exams, Quizzes and Final Project must be all work unique, original work performed entirely and exclusively by the student submitting the work, only using tools/aids that were specifically listed as allowed (e.g. note sheet in the exam - to be specified in advance by course staff).
- **Violations of UConn's Policy on Academic, Scholarly, and Professional Integrity and Misconduct** (https://policy.uconn.edu/2023/07/11/academic-scholarly-and-professional-integrity-and-misconduct-aspim-policy-on/) **in an assignment will result in a written notification to the student and a grade of 0% for the assignment. Serious and/or repeated violations will may result in referral to the Academic Integrity Hearing Board and/or failure in the course (see Appendix A to Student Code** (https://community.uconn.edu/the-student-code/the-student-code-appendix-a/)**).**

Exams (70%)

- **Mark your calendars.**
- In the rare and unusual case of missing a scheduled exam due to an emergency or illness, students may request the instructor for a make-up exam within 24 hours of the original exam time. The request must be sent by email to the course instructor (follow formatting guidelines in item I above). **The instructor will not approve more than one request per student per semester**. If the request is approved by the instructor:
    - Exams 1 & 2: the student will take the exam at the math proctoring center the following week.
    - Exam 3: the student will take the exam during the finals exams week, at the date, time and location announced by the registrar https://registrar.uconn.edu/exams/
- **Students with CSD accommodation need to make the arrangements with CSD at leave seven business days in advance**.
- Rare, unexpected extenuating circumstances and disruptions happen, yet accommodation beyond this policy are entirely subject to the instructor's discretion.

Quizzes (15%)

- The quizzes will be based on the practice problems and extra quiz problems from the Weekly Worksheet for the week prior, covering the material from the previous week.
- Students **may take up to two missed quizzes** at the math proctoring center the week following the quiz date but only when: a medical emergency has occurred, there was a conflict with an official UConn event (sports teams, national guard duty, etc), or the student was observing a religious holiday.
- For the Honors discussion section, some of the quizzes will be with the honors activities. The respective TA will provide details.

WebAssign (15%)

- Online homework. Each section in the textbook (including some topics not covered in class) has a corresponding WebAssign assignment with multiple problems, due on the date of the respective exam. Students can attempt each problem up to 100 times.
- Access to WebAssign is **included in the book bundle**. For all other students, free WebAssign access will be available for the first 10 days of classes and after that period, to maintain access, an access code needs to be purchased. Note that the grades for completed assignments will be recorded regardless of the access status.

Extra Credit (up to +7%)

- This consists of consist of multiple assignments of different types, listed below, with each awarding up to some prescribed number of points.
- Points will be awarded for satisfactory completion but won't be graded. Satisfactory completion means addressing all parts and aspects of the task though the approaches developed at the respective portion of the course.
- The extra credit will be added to the percentage obtained though the other components. The number added is computed as follows:
- **Minimum of (7, points awarded/12). That is, 84 points or higher will result in adding the full 7% extra credit.**

Point Types:

1. Weekly Worksheets, up to 5 points for each. These are due on Friday the following week.
    a. Practice problems, up to 3 points. Submit on HuskyCT.
    b. Extra Quiz Problems, 0 points. These come with solutions.
    c. Challenge problems, up to 2 points. Submit on paper to your TA during the discussion.
2. Additional Practice Worksheets, up to 2 points each. These are meant to help you prepare for the exams. Submit on HuskyCT on the date of the respective exam.
3. Practice Exams, up to 5 points each. We will post one practice exam for each exam. Submit on HuskyCT.
4. Exam Corrections, up to 5 points each. We will allow students to submit a complete correct solution to one problem in each exam. Submit on HuskyCT.
5. The instructor may announce additional extra credit assignments for a total of up to 25 points.

Exam/Quiz Make-up

- Students who are on official travel on behalf of the University (e.g. athletes) during exam/quiz dates must have a letter from a designee of the director of the respective program sent to the instructor by the end of the first week of classes confirming and justifying the absence.

In all other cases:

- **The course grading as described above includes all make-up options for the exams and quizzes.**

IV. Tips for success

1. Attend and actively engage in lectures and discussion sections, take notes and review them, ask questions.
2. Use course resources as your primary resource: the textbook, your notes, videos and other content on this courses' website, and most importantly: **course staff**. in class and through their office hours.
3. Need help? See 2.
4. Allocate time in your weekly schedule for working on the course (the expectation if for 16 weekly hours for a 4-credit course).
5. Complete all assignments in timely fashion.
6. Engage in discussions on the course with your peers.
7. Use technology for visualization and for experiencing the topics covered. Desmos/Geogebra is a simple and accessible tool. AI chatbots can be also made into helpful learning aids.
8. Review material before lectures.
9. Do problems that you have not previously done and/or do problems without knowing what section they came from.

V. Additional Information

Throughout the semester, it is normal to run into challenges in this course. These might be compounded by outside stressors. It is sometimes 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. Reach out! I am here to help you navigate the academic challenges in the course. You may also consider reaching out to the various support offices on campus, listed below.

Dean of Students Office (https://dos.uconn.edu/), Academic Achievement Center (https://achieve.uconn.edu/), Writing Center (https://writingcenter.uconn.edu/), Quantitative Learning Center (https://qcenter.uconn.edu/), Center for Students with Disabilities (https://csd.uconn.edu/), Title IX Office (https://titleix.uconn.edu/title-ix-at-uconn/about-title-ix-uconn/), Student Health and Wellness -- Mental Health (https://counseling.uconn.edu/)

Importance of Inclusivity

Throughout this course, you will be asked to interact with me, TAs and your classmates in different ways. Through these interactions, it is important to be mindful of the diversity of background and experience each of us brings to the class. I will do my best to ensure each student in the class has equitable access to the course material as well as to opportunities to earn credit. I ask when you are working with other students you create a good environment for your classmates. This might take the form of using someone's preferred pronouns, acknowledging differences in learning styles or background knowledge, or respecting someone's choice to maintain physical distance in the classroom space. If at any time you feel that you or someone around is not being treated respectfully, please do not hesitate to let me know.

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 (https://counseling.uconn.edu/)**Student Health and Wellness-Mental Health** (https://counseling.uconn.edu/) (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 in the university's student health insurance plan and 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/ (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 me as soon as possible. You do not need to disclose the nature of your illness; however, you will need to work with me 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.

Student Responsibilities and Resources

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important standards, policies and resources (https://onlinestudent.uconn.edu/learn--

more/#POL), which include:

- The Student Code
  - Academic Integrity
  - Resources on Avoiding Cheating and Plagiarism
- Copyrighted Materials
- Credit Hours and Workload
- Netiquette and Communication
- Adding or Dropping a Course
- Academic Calendar
- Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
- Sexual Assault Reporting Policy

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. 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/ (http://csd.uconn.edu/).

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government." (Retrieved March 24, 2013 from Blackboard's website (http://www.blackboard.com/platforms/learn/resources/accessibility.aspx))

Software/Technical Requirements (with Accessibility and Privacy Information)

The software/technical requirements for this course include:

- Equipment Recommendations (https://remotework.uconn.edu/equipment-recommendations/ (https://remotework.uconn.edu/equipment-recommendations/))

- HuskyCT/Blackboard (HuskyCT/ Blackboard Accessibility Statement (http://www.blackboard.com/Platforms/Learn/Resources/Accessibility.aspx), HuskyCT/ Blackboard Privacy Policy (http://www.blackboard.com/footer/privacy-policy.aspx))

- Adobe Acrobat Reader (http://www.adobe.com/products/acrobat/readstep2.html) (Adobe Reader Accessibility Statement (http://www.adobe.com/accessibility/products/reader.html), Adobe Reader Privacy Policy (http://www.adobe.com/privacy.html))

- Microsoft Office (free to UConn students through uconn.onthehub.com (https://uconn.onthehub.com/)) (Microsoft Accessibility Statement (http://www.microsoft.com/enable/microsoft/mission.aspx), Microsoft Privacy Statement (https://privacy.microsoft.com/en-us/privacystatement/))

- Dedicated access to high-speed internet with a minimum speed of 1.5 Mbps (4 Mbps or higher is recommended).

Privacy Statement: For information on managing your privacy at the University of Connecticut, visit the University's Privacy page (https://privacy.uconn.edu/). NOTE: This course has NOT been designed for use with mobile devices.

Help

Technical and Academic Help (https://onlinestudent.uconn.edu/frequently-asked-questions/) provides a guide to technical and academic assistance.

This course uses the learning management platform, HuskyCT (http://huskyct.uconn.edu/). If you have difficulty accessing HuskyCT, you have access to the in person/live person support options available during regular business hours through the Help Center (http://helpcenter.uconn.edu/). You also have 24x7 Course Support (http://www.ecampus24x7.uconn.edu/) including access to live chat, phone, and support documents.

Student Technology Training

Student technology training is now available in a new HuskyCT short course created by students for students. It will prepare you to use the IT systems and services that you will use throughout your time at UConn, whether learning online or on-campus. It is available at https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline (https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline) .

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.

- Copy and paste text, graphics or hyperlinks.