MATH 211 – Spring 2024 – Section 2
Advanced Calculus (Multivariable Calculus)

General Information

Please note:

1. The information in this syllabus is subject to change at any point in the semester, as deemed necessary by the instructor. [1] Any changes will be communicated to the students both in class and via email in a timely fashion. For the latest version of this document, please check the course page on Canvas or on class webpage.
2. This course provides an introduction to multivariable calculus, covering topics such as vectors, multivariable functions, partial derivatives, multiple integrals, vector and scalar fields, Green's and Stokes' theorems, and the divergence theorem.
3. Students taking this class should have a good background in calculus (prerequisite is MATH 112 or MATH 112Z or MATH_OX 112 or MATH_OX 112Z or equivalent transfer credit).

- **Instructor:** Tianshi Xu <txu41@emory.edu>.
- **Class Schedule:** MW 1:00 - 2:15 pm — Math & Science Center - N306.
- **Instruction Method:** In person, unless there are special circumstances.
- **Office Hours:**
  - WF 2:30 - 3:30 pm — Math & Science Center - N436 (regular)
  - F 5:00 - 6:00 pm — Math & Science Center - N436 (by appointment)
  - Other times: You are always welcome to email the instructor directly to make extra appointments.

  All office hours will be held in a hybrid format, allowing you to attend in person or join via Zoom. You are always welcome to email the instructor directly to make extra appointments.

Materials and Tools

- **Canvas Page:** https://canvas.emory.edu/courses/126887 It is your responsibility to visit the website periodically.

[1] Last Updated: April 3, 2025

- **Instructor's class pages:** https://math.emory.edu/ txu41/MA211S24/math211s24.html.
- **Textbook:** Multivariable Calculus, James Stewart 8th edition. ISBN: 978-1305266643.
- **Lecture Notes:** Lecture notes will be posted to the Canvas page and the instructor's class pages after class.
- **Tech Requirements:** It is recommended that you have access to the following equipment:
  - A computer with reliable internet access. You should be able to access the Canvas site.
  - A scanner or smartphone for taking photos to upload online.

  No calculators or calculating devices are allowed during the midterms and the final.

Grading Information

- **Grade Distribution:**

Homework	25 %
Quizzes	15 %
Midterms	30 %
Final	30 %
Total	100 %

- **Grading Scale:** Your final grade will be decided based on the following scale:

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

  The class may be curved in the end at the discretion of the instructor. However, your final course grade will be no worse than your actual grade. That is, we will never "curve down". Besides, each exam may be "curved up". As a result, the course grade will not be rounded up. For example, a course grade of 92.99% is strictly 92.99% (and hence an A-).

- **Honor Code:** Students are required to follow the Emory University Honor Code throughout the semester. Details can be found at Emory Honor Code.
- **Attendance:** Attendance is not required but strongly recommended. Please maintain a respectful and professional demeanor if you come to class.

- **Homework:** There will be ten homework assignments (please see the tentative schedule section for the schedule). Regarding homework, while most assignments will primarily be graded on completion, one problem—specified in advance by the instructor—will be assessed for accuracy. To accommodate late submissions, we have a policy that allows for late assignments with a deduction of 15% per day, for up to two days. Assignments submitted later than two days will receive no credit. The two lowest homework scores will be dropped, and the first homework will be graded solely based on completion.
- **Quizzes:** There will be four short in-class quizzes (please see the tentative schedule section for the schedule). Those quizzes are short. The lowest quiz score will be dropped.
- **Exams:** There will be two midterms and one final exam (cumulative). Please see the tentative schedule section for the schedule of the exams. All exams will be held in person. More details TBA. Makeup exams will be given only with adequate excuses. The exam may be curved at the discretion of the instructor. However, your grades will be no worse than your actual grades. That is, we will never "curve down".
- **Important Dates:**
  - **02/21/24:** Midterm 1. Regular class time. Location — Math & Science Center - N306.
  - **04/03/24:** Midterm 2. Regular class time. Location — Math & Science Center - N306.
  - **05/06/24:** Fianl exam. 11:30 AM – 2:00 PM. Location — Math & Science Center - N306.

Student Success Resources

- **Tech Support:** For technical assistance, refer to Emory IT Services.
- **Undergraduate Education Resources:** The Office of Undergraduate Education offers various student support services including academic advice, peer tutoring, and guidelines for missed exams. More information is available at OUE Emory.
- **Accessibility Services:** Students with documented disabilities or who suspect they may have a disability should reach out to the Office of Accessibility Services for accommodation support and resources. Confidentiality regarding any disability-related information is assured. Further details can be found at Office of Accessibility Services Emory.
- **Academic and Religious Observance Calendar:** Please familiarize yourself with the Academic Calendar for crucial academic dates.
- **Health and Wellness Resources for Students:** Achieving academic success is closely linked to maintaining a healthy lifestyle, both mentally and physically. Emory

University offers several no-cost resources to support student well-being:

  - Emory HelpLine: For non-critical mental health needs, students can reach out to the Emory HelpLine at 404-727-4357. This confidential, peer-run phone counseling service operates every evening from 8:30 pm to 1:00 am.
  - For immediate mental health concerns, the Student Counseling Center is available at 404-727-7450.
  - This program supports students dealing with sexual assault, relationship violence, or stalking. Confidential consultations, crisis intervention, and referrals are provided. Contact them at 404-727-1514.
  - Offering a broad range of services including primary care, physical exams, dietary and substance abuse counseling, Emory Student Health is committed to supporting students' physical health.

- **Policy on Harassment:** As per Emory Equal Opportunity and Discriminatory Harassment Policy, Emory University strictly prohibits any form of discriminatory harassment. This includes sexual harassment and harassment based on race, color, religion, ethnic or national origin, gender, genetic information, age, disability, sexual orientation, gender identity, gender expression, veteran status, or any other category protected under applicable law. This policy applies to faculty, staff, administration, students, vendors, contractors, guests, and patrons on campus.

Tentative Topics

Section	Topic
Chapter 12	
Section 12.1	Three Dimensional Coordinate Systems Lecture 1
Section 12.2	Vectors Lecture 1
Section 12.3	The Dot Product Lecture 2, 3, & 4
Section 12.4	The Cross Product Lecture 3 & 4
Section 12.5	Equations of Lines and Planes Lecture 4
Chapter 14	

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Section	Topic
Section 14.1	Functions of Several Variables Lecture 5
Section 14.2	Limits and Continuity Lecture 5
Section 14.3	Partial Derivatives Lecture 6 & 7
Section 14.4	Tangent Planes and Linear Approximations Lecture 7
Section 14.5	The Chain Rule Lecture 8
Section 14.6	Directional Derivatives and the Gradient Vector Lecture 8 & 9
Section 14.7	Maximum and Minimum Values Lecture 9
Section 14.8	Lagrange Multipliers Lecture 10
Chapter 15	
Section 15.1	Double Integrals over Rectangles Lecture 11
Section 15.2	Double Integrals over General Regions Lecture 12 & 13
Section 15.4	Applications of Double Integrals Lecture 13
Section 15.6	Triple Integrals Lecture 14
Section 15.9	Change of Variables in Multiple Integrals Lecture 15
Section 15.3	Double Integrals in Polar Coordinates Lecture 16
Section 15.7	Triple Integrals in Cylindrical Coordinates Lecture 17

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Section	Topic
Section 15.8	Triple Integrals in Spherical Coordinates Lecture 18
Chapter 13	
Section 13.1	Vector Functions and Space Curves Lecture 19
Section 13.2	Derivatives and Integrals of Vector Functions Lecture 19
Chapter 16	
Section 16.1	Vector Fields Lecture 20
Section 16.2	Line Integrals Lecture 20 & 21
Section 16.3	The Fundamental Theorem for Line Integrals Lecture 21
Section 16.4	Green's Theorem Lecture 22
Section 16.5	Curl and Divergence Lecture 22 & 23
Section 16.6	Parametric Surfaces and Their Areas Lecture 23
Section 16.7	Surface Integrals Lecture 24
Section 16.8	Stokes' Theorem Lecture 25
Section 16.9	The Divergence Theorem Lecture 25

Tentative Schedule

Red: No Lecture (Exam or holiday)

Blue: In Class Quiz

Orange: Homework out

Purple: Homework Due

Week	Monday	Wednesday
Week 1	No Class: 01/15/24 Martin Luther King Holiday University Holiday - No Class	Lecture 1: 01/17/24 Section 12.1
Week 2	Lecture 2: 01/22/24 Section 12.2 & 12.3	Lecture 3: 01/24/24 Section 12.3 & 12.4 Homework 1 out
Week 3	Lecture 4: 01/29/24 Section 12.3, 12.4 & 12.5	Lecture 5: 01/31/24 Section 14.1 & 14.2 Homework 1 due Homework 2 out
Week 4	Lecture 6: 02/05/24 Section 14.3 Quiz 1	Lecture 7: 02/07/24 Section 14.3 & 14.4 Homework 2 due Homework 3 out
Week 5	Lecture 8: 02/12/24 Section 14.5 & 14.6	Lecture 9: 02/14/24 Section 14.6 & 14.7 Homework 3 due
Week 6	Lecture 10: 02/19/24 Section 14.8	Midterm 1: 02/21/24 Midterm 1 Covering through 14.6 Homework 4 out
Week 7	Lecture 11: 02/26/24 Section 15.1 Quiz 2	Lecture 12: 02/28/24 Section 15.2 Homework 4 due Homework 5 out
Week 8	Lecture 13: 03/04/24 Section 15.2 & 15.4	Lecture 14: 03/06/24 Section 15.6 Homework 5 due Homework 6 out

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Week	Monday	Wednesday
Week 9	No Class: 03/11/24 Spring Break No Class	No Class: 03/13/24 Spring Break No Class
Week 10	Lecture 15: 03/18/24 Section 15.9	Lecture 16: 03/20/24 Section 15.3 Homework 6 due Homework 7 out
Week 11	Lecture 17: 03/25/24 Section 15.7 Quiz 3	Lecture 18: 03/27/24 Section 15.8 Homework 7 due
Week 12	Lecture 19: 04/01/24 Section 13.1 & 13.2	Midterm 2: 04/03/24 Midterm 2 Covering through 15.8 Homework 8 out
Week 13	Lecture 20: 04/08/24 Section 16.1 & 16.2	Lecture 21: 04/10/24 Section 16.2 & 16.3 Homework 8 due Homework 9 out
Week 14	Lecture 22: 04/15/24 Section 16.4 & 16.5 Quiz 4	Lecture 23: 04/17/24 Section 16.5 & 16.6 Homework 9 due Homework 10 out
Week 15	Lecture 24: 04/22/24 Section 16.7	Lecture 25: 04/24/24 Section 16.8 & 16.9 Homework 10 due
Week 16	Final Review: 04/29/24 Final Review	No Class: 05/01/24 No Class
Week 17	Final Exam: 05/06/24 Final Exam 11:30 AM – 2:00 PM Location N306	This cell is intentionally left blank