MATHS1202 Calculus IV. Summer 2023.

Basic info.

Instructor : Baiqing Zhu.	email : bz2393@columbia.edu
Class room : TBD	Class times : Tu Th 9:00 am - 12:10 pm.
Office hours and rooms : Tu & Th 3:00 pm - 4:30 pm	(or by appoinment) at Math 416.
TA: Abhiram Gaddam	email: ag3651@columbia.edu

Textbook. Calculus: *Early Transcendentals*, 9th edition, by James Stewart.
Please ensure that you have the right edition of the textbook as we will be using it to assign homework.

Course overview.

Multiple integrals (especially double and triple integrals) and applications; vector fields on Euclidean space and surfaces; curl and divergence; integrals on surfgaces.

Learning objectives.

Understand multiple integrals, know applications and the methods to compute them; understand the concept of vector fields; compute curl and divergence of a vector field; parametrize surfaces and compute integrals on surfaces; understand and use Green's theorem, Stokes' theorem and the divergence theorem.

Exams and homework.

- Homework (30%) : It will be assigned every Tuesday and Thursday. The homework assigned on Tuesday (resp. Thursday) will be due next Tuesday (resp. Thursday). Homeworks will be submitted via Canvas and graded on Gradescope.
- Midterm exams (30%): we have one **in-person** midterm which will take **1.5 hours**. It's now (tentatively) scheduled on **Thursday June 8th** during normal class hours.
- Final exam (40%): we have **in-person** final exam which takes **2 hours**. It's now scheduled on **Thursday June 29th** during normal class hours.

Course policies.

Late work. Each written assignment will have a grace period of 12 hours past their due date and a late due date. Work submitted after the grade period, but before the late due date will incur a penalty of 20% per day calculated from the end of the grade period. There will be no credit granted to any written assignment that is not submitted past the late due date noted in the course syllabus without advance notice and permission from the instructor.

Collaborations. While you are welcome to collaborate with your peers with your homework, you must attempt all problems on your own and your submitted solutions must be written out individually. Submissions which are copied or suspiciously similar may be rejected. A substantiated violation of the code of academic integrity may result to serious academic disciplinary action.

Tentative class plan and assigned exercises.

Date	Topic	Read	Recommended exercises (in **red**, to submit)
Tu 5/23	Double integrals over Rectangles; Double integrals general regions	15.1 15.2	**2**, 6, 7, 9, **16**, 17–20, 29, **32**, 36, 39, **44**, 47. **2**, 7, **8**, 11, 13, 17, **20**, 23, 25, 27, **32**, 35, 61, 63.
Th 5/25	Double Integrals in Polar Coordinates; Applications of Double Integrals	15.3 15.4	7, **10**, 11, 12, 17, 23, **32**, **40**, 41, 43, **50**. 5, **8**, 9, 11, **16**,17, **20**, 21, **30**.
Tu 5/30	Surface Area; Triple Integrals	15.5 15.6	1, 3, **4**, **8**, **12**, 13, 17, 19, **23**, 25. 2, **4**, 5, 9, **10**, 13, **14**, 23, **32**, 35, 37, 41, 43, 49.
8Th 6/1	Triple Integrals in Cylindrical Coordinates; Triple Integrals in Spherical Coordinates	15.7 15.8	1, 3, 5, ,**8**, 9, 17, 19, **20**, 23, 25, **30**, **32**. **2**, 3, 5, 7, **10**, 11, 13, **18**, 19, 23, **26**, 31, 35, 37, **40**, 51.
Tu 6/6	Change of Variables in Multiple Integrals; Review of Ch. 15.	15.9	1, 3, **6**, 7, **10**, 11, 15, 17, **18**, 25, **26**, 29. 3, 5, 9, 15, 19, 23, 25, 31, 37, 41, 47, 51, 57.
Th 6/8	**1st Midterm**; Vector fields	 16.1	 1, 3, **8**, 13–18, 19–22, 25, **26**, 31–34, **38**, **40**.
Tu 6/13	Line integrals; The fundamental theorem for line integrals	16.2 16.3	1, **4**, 7, 9, **10**, 13, **20**, 21, **24**, 35, 41, **42**, 45, 49. 1, 3, **6**, 7, 11, **13**, 17, **20**, 25, 27, 31, 35, **41**.
Th 6/15	Green's Theorem; Curl and Divergence	16.4 16.5	1, **4**, 5, **8**, 11, 13, 15, 21, **22**, 25, **26**, 29. 1, **4**, 5, 7, 9, 11, 14, 15, **18**, 23, **28**, 29, 31, 35, **36**.
Tu 6/20	Parametric surfaces and their areas; surface integrals	16.6 16.7	3, **6**, 7, 9, 13–18, 19, **22**, 23, 33, 35, **36**, 39, **42**, 45, 47. 3, 5, **8**, 9, 13, 17, 21, **22**, 25, 27, **28**, **38**, 43.
Th 6/22	Stokes' theorem; the Divergence theorem	16.8 16.9	1, 3, **4**, 7, 9, **12**, 13, 17, **20**, 21, **22**. 1, **4**, 5, **8**, 9, **14**, 19, 21, 27, 28, 29, **30**, 33.
Tu 6/27	Review Ch. 16.; Review the whole class	16.10	3, 5, 7, 11, 13, 15, 17, 21, 25, 27, 33, 35, 37.
We 6/28	Reading day		
Th 6/29	**Final Exam**		

Letter grade scale.

Grade	Percentage
A+	98-100%
A	93-97.9%
A-	90-92.9%
B+	87-89.9%
B	83-86.9%
B-	80-82.9%
C+	77-79.9%
C	73-76.9%
C-	70-72.9%
D	60-69.9%
F	59.9% and below

University policies and resources.

Academic Integrity. Columbia University expects its students to act with honesty and propriety at all times and to respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely. It is essential to the academic integrity and vitality of this community that individuals do their own work and properly acknowledge the circumstances, ideas, sources, and assistance upon which that work is based. Academic honesty in class assignments and exams is expected of all students at all times.

Diversity Statement. It is our 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 the students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

Accessibility. Columbia is committed to providing equal access to qualified students with documented disabilities. A student's disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website: https://health.columbia.edu/content/disability-services.