



蘇州大學
Soochow University

MAT 222 Multivariable Calculus

Fall 2023

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

This course introduces the concepts and applications of multivariable calculus. Topics covered vector algebra, matrices and vector spaces, polar, spherical and cylindrical coordinates, change of variables, line integrals, Green's theorem, parametric surfaces and surface integrals, Curl and Stokes's theorem, existence of potentials, divergence and Gauss's theorem and applications.

Upon Completion of this Course, students will be able to:

1. Develop a deep understanding of functions of multiple variables;
2. Compute limits, partial derivatives, directional derivatives and gradient vectors of functions of several variables;
3. Use and understand Green's Theorem, and curl and divergence of vector fields;
4. Calculate surface integrals, and use Stokes Theorem and the Divergence Theorem.

PREREQUISITES

MAT 120 Calculus II

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM

POINTS



| | |
|---------------|------------|
| 2 Assignments | 20 Points |
| 2 Quizzes | 20 Points |
| Midterm Exam | 25 Points |
| Final Exam | 35 Points |
| Total | 100 Points |

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

James Stewart, *Calculus : Early Transcendentals*, 8th Edition, Cengage Learning, 2016.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

| MODULE | TASKS |
|----------|--|
| Module 1 | Topics: Topic 1: Vectors In Two and Three Dimensions Topic 2: Vectors and Equations Topic 3: Dot Products Topic 4: Cross Products Assessments: Assignment #1 |
| Module 2 | Topics: Topic 5: Equations and Distance Topic 6: Coordinate Systems Topic 7: Vector Functions and Space Curves Topic 8: Derivatives and Integrals of Vector Functions Assessments: Quiz #1 |



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|----------|--|
| Module 3 | Topics: Topic 9: Functions of Several Variables Topic 10: Limits and Continuity Topic 11: Partial Derivatives Topic 12: The Chain Rule Assessments: Assignment #2 Midterm Exam |
| Module 4 | Topics: Topic 13: Double Integrals over Rectangles Topic 14: Double Integrals over General Regions Topic 15: Double Integrals in Polar Coordinates Topic 16: Triple Integrals Assessments: Quiz #2 |
| Module 5 | Topics: Topic 17: Green's Theorem Topic 18: The Vector Field W Topic 19: Stokes's Theorem Topic 20: Gauss's Theorem Assessments: Final Exam |

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.



LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a



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learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.