



蘇州大學
Soochow University

MAT 315 Advanced Calculus I

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

Advanced Calculus I is an intensive course aiming to deepen students' understanding of key calculus concepts and their practical applications. Topics include sequences, series, Taylor's theorem, limits, continuity, differentiation, integration, and numerical methods. The course also covers multivariable calculus, including partial differentiation, gradients, tangent planes, and multiple integrals.

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

1. develop a thorough understanding of advanced calculus concepts and their applications;
2. Enhance students' problem-solving skills in mathematical analysis and calculus;
3. Enable students to apply advanced calculus techniques to solve real-world problems in various fields;
4. Equip students with the necessary mathematical tools for further studies in mathematics and related disciplines;

PREREQUISITES

MAT 130 Linear Algebra; MAT 140 Introduction to Mathematical Proofs; MAT 260 Calculus III

GRADING

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



ITEM	POINTS
2 Homework	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:

1. Robert Wrede and Murray R. Spiegel, *Schaum's Outline of Advanced Calculus*(3rd ed), 2010, McGraw Hill.
2. Walter Rudin, *Principles of Mathematical Analysis*(3rd ed), 1976, McGraw Hill.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Infinite sequences and series Topic 2: Power series Topic 3: Convergence tests Topic 4: Taylor's theorem for single-variable functions Assessments: Homework #1
Module 2	Topics: Topic 5: Taylor series for single-variable functions Topic 6: Limits and continuity Topic 7: Differentiability of multivariable functions Topic 8: Partial differentiation



	Assessments: Quiz #1
Module 3	Topics: Topic 9: Directional derivatives and gradients Topic 10: Tangent planes Topic 11: Linear approximation Topic 12: Critical points Assessments: Homework #2 Midterm Exam
Module 4	Topics: Topic 13: Extremum problems Topic 14: Implicit function theorem Topic 15: Jacobian matrices Topic 16: Multiple integrals Assessments: Quiz #2
Module 5	Topics: Topic 17: The Real and Complex Number Systems Topic 18: Convergent and divergent sequences Topic 19: Continuous functions Topic 20: Integration 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.



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Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.