



蘇州大學
Soochow University

MAT 258 Introduction to Complex Analysis

Fall 2023

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course offers a thorough initiation into the realm of complex variable theory and its practical implications for contemporary engineering challenges. Topics include complex numbers, analytic functions, integration, Taylor and Laurent series and more. Furthermore, the course delves into the examination of one or more real-world applications of this theory.

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

1. Understand the fundamentals of complex numbers, representation in the complex plane and arithmetic operations
2. Learn to evaluate complex integrals along contours, understanding the Cauchy Integral Theorem and Cauchy's Integral Formula.
3. Investigate the convergence and manipulation of complex power series, deriving Taylor and Laurent series expansions
4. Apply the theory, methods and techniques of the course in solving mathematical problems
5. Investigate real-world applications of complex analysis in various fields

PREREQUISITES

MAT 130 Linear Algebra

GRADING

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



ITEM	POINTS
Quizzes	20 Points
Midterm 1	15 Points
Midterm 2	15 Points
Group Project	20 Points
Final Exam	30 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:

Edward B. Saff; Arthur David Snider, *Fundamentals of Complex Analysis*, 3rd Edition, Pearson, 2003.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Complex Numbers Topic 2: The Algebra of Complex Numbers Topic 3: Vectors and Polar Forms Topic 4: The Complex Exponential Assessments: Quiz#1



Module 2	Topics: Topic 5: Analytic Functions Topic 6: Functions of a Complex Variable Topic 7: Analyticity Topic 8: The Cauchy-Riemann Equations Assessments: Quiz#2 Group Project 1
Module 3	Topics: Topic 9: Elementary Functions Topic 10: Polynomials and Rational Functions Topic 11: Contour Integrals Topic 12: Cauchy's Integral Theorem Assessments: Midterm#1 Group Project 2
Module 4	Topics: Topic 13: a Deformation of Contours Approach Topic 14: Vector Analysis Approach Topic 15: Cauchy's Integral Formula and Its Consequences Topic 16: Bounds for Analytic Functions Assessments: Midterm#2
Module 5	Topics: Topic 17: Taylor Series Topic 18: Laurent Series Topic 19: Improper Integrals Involving Trigonometric Functions Topic 20: Integrals Involving Multiple-Valued Functions 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.



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