



蘇州大學  
Soochow University

## **MAT 311 Algebra**

**Fall 2023**

**Course Credits:** 4

**Contact Hours:** 55 hours

**Instructor:** TBA

**Email:**TBA

### **COURSE OBJECTIVES**

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This course is designed to provide students with a solid foundation in algebraic concepts and problem-solving skills. The course will focus on matrices, conjugation, groups, vector spaces and modules, linear maps. Through a combination of theoretical discussions, problem-solving exercises, and real-world applications, students will develop their algebraic reasoning and critical thinking abilities.

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

1. Understand and apply basic algebraic operations, including simplifying expressions, solving equations, and manipulating inequalities
2. Graph and analyze linear equations and inequalities in one and two variables
3. Demonstrate proficiency in manipulating algebraic expressions, including simplifying, factoring, and expanding
4. Analyze and graph linear and quadratic functions
5. Develop problem-solving and critical thinking skills through mathematical reasoning and logical arguments

### **PREREQUISITES**

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MAT 229 Linear Algebra I; MAT 236 Linear Algebra II

### **GRADING**

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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
Problem Sets	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:

S. Lang, *Undergraduate Algebra*, 3rd Edition, Springer, 2005.

### Recommended (Optional) Texts or Other Materials:

None

## COURSE TOPICS

MODULE	TASKS
Module 1	<p><b>Topics:</b>  Topic 1: The Integers  Topic 2: Basic Properties  Topic 3: Groups  Topic 4: Mappings</p> <p><b>Assessments:</b>  Quiz#1</p>
Module 2	<p><b>Topics:</b>  Topic 5: Rings  Topic 6: Homomorphisms  Topic 7: Polynomials  Topic 8: Unique Factorization</p> <p><b>Assessments:</b>  Quiz#2</p>



Module 3	<b>Topics:</b> Topic 9: Vector Spaces and Modules Topic 10: Matrices and Linear Maps Topic 11: Some Linear Groups Topic 12: The Conjugation Action <b>Assessments:</b> Midterm#1 Problem Set#1
Module 4	<b>Topics:</b> Topic 13: Field Theory Topic 14: Galois Theory Topic 15: Finite Fields Topic 16: The Frobenius Automorphism <b>Assessments:</b> Midterm#2 Problem Set#2
Module 5	<b>Topics:</b> Topic 17: The Real and Complex Numbers Topic 18: Construction of the Real Numbers Topic 19: Sets Topic 20: Zorn's Lemma <b>Assessments:</b> 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:



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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.