



蘇州大學
Soochow University

MAT 230 Linear Algebra II

Winter 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

This is a higher-level course of linear algebra. Topics in this course will include vector spaces, finite-dimensional vector spaces, linear transformations, polynomials, eigenvalues, eigenvectors, and invariant subspaces, inner product spaces, operators on inner product spaces, operators on complex vector spaces, operators on real vector spaces, trace and determinant, etc. Students are expected to gain more curiosity and greater competence as well as computational fluency.

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

1. Understand and apply the basic concepts and principles of advanced linear algebra;
2. Develop further and to continue the study of linear algebra;
3. Apply knowledge of linear algebra to a variety of practical problems;
4. Achieve fluency in mathematical computations and sophistication in mathematical thinking.

PREREQUISITES

N/A

GRADING

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

ITEM

POINTS



Assignments	40 Points
Midterm Test	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:

Linear Algebra Done Right by Axler, Sheldon Jay, 3rd Edition, Addison-Wesley, 2015.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Vector Spaces Topic 2: Subspaces and Direct Sums Topic 3: Finite-Dimensional Vector Spaces Topic 4: Span and Linear Independence Assessments: Assignment#1
Module 2	Topics: Topic 5: Bases and Dimension Topic 6: Linear Transmission Topic 7: Null Spaces and Ranges Topic 8: Matrices Assessments: Assignment#2



Module 3	Topics: Topic 9: Polynomials Topic 10: Eigenvalues, Eigenvectors, and Invariant Subspaces Topic 11: Inner Product Spaces Topic 12: Inner Products and Norms Assessments: Midterm Test Assignment#3
Module 4	Topics: Topic 13: Operators on Inner Product Spaces Topic 14: Adjoints Topic 15: Self-Adjoint Operators Topic 16: Positive Operators and Isometries Assessments: Assignment#4
Module 5	Topics: Topic 17: Polar Decomposition and Singular Value Decomposition Topic 18: Operators on Complex Vector Spaces Topic 19: The Minimal Polynomial; Jordan Form Topic 20: Operators on Real Vector Spaces; Trace and Determinant 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.