



MAT 170 Linear Algebra and Matrix Theory

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course provides an introduction to linear algebra and matrix theory for students. Topics covered include vector spaces, subspaces, linear transformations, matrices, determinants, eigenvalues, eigenvectors, orthogonal and unitary matrices, systems of linear differential equations, and more. This course is foundational in mathematics, aiming to help students establish a solid academic footing. It will assist in developing the necessary mathematical skills for subsequent courses and other academic disciplines, broadening mathematical comprehension, and enhancing mathematical proficiency.

Upon completion of this course, student will be able to:

1. Understand the basic concepts of linear algebra.
2. Develop a theoretical understanding of linear algebra concepts and their applications in various fields.
3. Perform matrix operations and utilize matrix techniques to solve real-world problems.
4. Comprehend matrix theory, linear equation systems, vector spaces, and eigenvalues.

PREREQUISITES

N/A

GRADING

Grades will be determined by accumulating points, with 100 points being the



maximum, as follows:

ITEM	POINTS
Class Participation	10 Points
Quizzes	30 Points
Midterm	20 Points
Final Exam	40 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:

E. D. Nering. (1991), *Linear Algebra and Matrix Theory*, 2nd Edition, Wiley.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	<p>Topics: Topic 1: Definitions and Bases of Vector Spaces. Topic 2: Linear Independence and Linear Dependence. Topic 3: Subspaces. Topic 4: Linear Transformations.</p> <p>Assessments: Quiz#1</p>
Module 2	<p>Topics: Topic 5: Matrices. Topic 6: Hermite Normal Form. Topic 7: Elementary Operations and Elementary Matrices. Topic 8: Linear Problems and Linear Equations.</p> <p>Assessments:</p>



	Quiz#2
Module 3	Topics: Topic 9: Determinants. Topic 10: Eigenvalues and Eigenvectors. Topic 11: Similarity Transformations. Topic 12: Linear Functionals . Assessments: Midterm
Module 4	Topics: Topic 13: Duality of Linear Transformations. Topic 14: Bilinear Forms. Topic 15: Quadratic Forms. Topic 16: Hermitian Forms. Assessments: Quiz#3
Module 5	Topics: Topic 17: Orthogonal and Unitary Transformations. Topic 18: Normal Matrices. Topic 19: Linear Programming. Topic 20: Systems of Linear Differential Equations. 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.