



Hunan University MATH 23: Linear Algebra

Professor: To be announced
Total contact hours: 54 hours
Credit: 4

Course Description

Students are expected to have mastered the fundamental ideas of linear algebra and to be able to apply these ideas to a variety of practical problems.

More specifically, in Math 23 you will be expected to:

- Explore and learn the core concepts, which include systems of linear equations, matrices, vectors, determinants, linear transformations, orthogonality, and eigenvalues;
- Begin to think abstractly about certain of these topics;
- Understand how these ideas can be used to solve problems and compute things.

Textbook

Linear Algebra, a Modern Introduction, Third Edition by David Pole.

Grading

- Homework / Quizzes 10%
- Midterm 1 30%
- Midterm 2 30%
- Final Exam 30%

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	

Guide

Each week you will be assigned a selection of problems to write up and hand in, chosen from the practice problems (provide on the first day of classes). Some will be grade and all returned. At the instructor's discretion there may be quizzes or written assignments. The quizzes might be based on the material covered and homework assignments. The final exam will be covering



the material from the midterm to the last lecture. *Calculators are NOT allowed on quizzes, midterms, or the final exam.*

Course Schedule

The course has 24 class sessions in total. All sessions are 2 hours and 15 minutes in length. Note: the course outline and required readings are subject to change.

Class 1:

Introduction to the course

Section 1. The Geometry and Algebra of Vectors

Class 2:

Review of homework assignments

Section 1.2 Length and Angle. The Dot Product

Class 3:

Review of homework assignments

Section 1.3 Lines and Planes

Class 4:

Review of homework assignments

Section 2.1 Introduction to Systems of Linear Equations

Class 5:

Review of homework assignments

Section 2. Direct Methods for Solving Linear Equations

Class 6:

Review of homework assignments

Section 2.3 Spanning Set and Linear Independence

Class 7:

Review of homework assignments; Review for the Midterm 1

Class 8:

Midterm No. 1

Class 9:

Section 3.1 Matrix Operations

Class 10:

Review on homework assignments

Section 3.2 Matrix Algebra



Class 11:

Review on homework assignments

Section 3. The Inverse of a Matrix

Class 12:

Review of homework assignments

Section 3.5 Subspaces, Basis, Dimension and Rank

Class 13:

Review of homework assignments

Section 3.6 Introduction to linear transformations

Class 14:

Review of homework assignments

Section 4.1 Introduction to Eigenvalues and Eigenvectors

Class 15:

Section 4.2 Determinants

Review for Midterm 2; Midterm No. 2

Class 16:

Section 4.3 Eigenvalues and Eigenvectors of $n \times n$ Matrices

Class 17:

Section 4.3 Eigenvalues and Eigenvectors of $n \times n$ matrices (Cont.)

Class 18:

Review of homework assignments

Section 4. Similarity and Diagonalization

Class 19:

Section 4. Similarity and Diagonalization (Cont.)

Class 20:

Review of homework assignments; Section 5.1 Orthogonality

Class 21:

Review of homework assignments

Section 5.2 Orthogonal Complements and Orthogonal Projections

Class 22:

Section 5.3 The Gram-Schmidt Process

Class 23:



Section 5.4 Orthogonal Diagonalization of Symmetric Matrices

Class 24:
Final Exam

Attending Policy

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.

Policy on "Late Withdrawals"

In accordance with university policy, appeals for late withdrawal will be approved **ONLY** in case of medical emergency and similar crises.

Academic Honesty

Hunan University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

General Expectations:

Students are expected to:

- Attend all classes and be responsible for all materials covered in class and otherwise assigned;
- Complete the day's required reading and assignments before class;
- Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;
- Participate in class discussions and complete required written work on time;
- Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;
- While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Special Needs or Assistance

Please contact the 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. Our goal is to help you learn, not to penalize you for issues which mask your learning.