暨南大學 JINAN UNIVERSITY

Summer 2023

0701M340
Linear Algebra

Instructor: TBA

Time: May 8, 2023-June 9, 2023

Office Hours: 2 hours (according to the teaching schedule)

Contact Hours: 60 (50 minutes each)

Credits: 4

E-mail: TBA

Course Description

Systems of linear equations, vector spaces and subspaces, bases, linear transformations, determinants, eigenvalues and eigenvectors, diagonalization of symmetric matrices, orthogonality, inner product spaces and quadratic forms, and application.

Prerequisites

Calculus I

Required Textbook(s)

Linear Algebra and Its Applications, 5th Edition, David C. Lay. ISBN: 9780321982384

*You will need to purchase an access code for MyMathLab. This comes with an e-book, so it is optional to purchase the physical textbook.

Course Goals

Develop an understanding of the theory of systems of linear equations, matrices, determinants, vector spaces, and linear transformations. Develop ability to handle abstract mathematics.

Course Schedule

The schedule gives an overview of the major concepts in this course. The actual days on which the topics will be covered are subject to change at the discretion of the course instructor. Numbers in parentheses refer to the related textbook chapters.

Week 1:

Chapter 1:

- Section 1.1 – Systems of Linear Equations
- Section 1.2 – Row Reduction and Echelon Forms
- Section 1.3 – Vector Equations
- Section 1.4 – The Matrix Equation $\boldsymbol{Ax=b}$
- Section 1.5 – Solution Sets of Linear Systems
- Section 1.7 – Linear Independence
- Section 1.8 – Introduction to Linear Transformations
- Section 1.9 – The Matrix of a Linear Transformation

Week 2:

Chapter 2:

- Section 2.1 – Matrix Operations
- Section 2.2 – The Inverse of a Matrix

- Section 2.3 – Characteristics of Invertible Matrices
- Section 2.5 – Matrix Factorizations
- Section 2.8 – Subspaces of $\mathbb{R}^n$
- Section 2.9 – Dimension and Rank

Chapter 3

- Section 3.1 – Introduction to Determinants
- Section 3.2 – Properties of Determinants
- Section 3.3 – Cramer's Rule, Area, and Linear Transformations

Week 3:

- ***MIDTERM EXAM (Ch. – Ch. 3)***

Chapter 4

- Section 4.1 – Vector Spaces and Subspaces
- Section 4.2 – Null Spaces, Column Spaces, and Linear Transformations
- Section 4.3 – Linearly Independent Sets; Bases
- Section 4.5 – The Dimensions of a Vector Space
- Section 4.6 – Rank
- Section 4.7 – Change of Bases

Week 4:

Chapter 5

- Section 5.1 – Eigenvectors and Eigenvalues
- Section 5.2 – The Characteristic Equation
- Section 5.3 – Diagonalization
- Section 5.4 – Eigenvectors and Linear Transformations
- Section 5.5 – Complex Eigenvalues

Week 5:

Chapter 6

- Section 6.1 – Inner Product, Length, & Orthogonality
- Section 6.2 – Orthogonal Sets
- Section 6.3 – Orthogonal Projections
- Section 6.4 – The Gram-Schmidt Process

- ***FINAL EXAM (Ch. 4 – 6)***

Grading Policy

Online Homework	25 %
Written Assignments	15 %
Midterm Exam	30 %
Final Exam	30%
TOTAL	**100 %**

Grading Scale

The instructor will use the grading system as applied by JNU:

Definition	Letter Grade	Score
Excellent	A	90~100
Good	B	80~89
Satisfactory	C	70~79
Poor	D	60~69
Failed	E	Below 60

Academic Integrity

As members of the Jinan University academic community, students are expected to be honest in all of their academic coursework and activities. Academic dishonesty, includes (but is not limited to) cheating on assignments or examinations; plagiarizing, i.e., misrepresenting as one's own work any work done by another; submitting the same paper, or a substantially similar paper, to meet the requirements of more than one course without the approval and consent of the instructors concerned; or sabotaging other students` work within these general definitions. Instructors, however, determine what constitutes academic misconduct in the courses they teach. Students found guilty of academic misconduct in any portion of the academic work face penalties that range from the lowering of their course grade to awarding a grade of E for the entire course.