

0701M245

Linear Algebra and Differential Equations

Instructor: TBA

Time: May 13, 2024 - June 14, 2024

Office Hours: By appointment.

Contact Hours: 60 (50 minutes each)

Credits: 4

E-mail: TBA

Course Description

In this course we will study linear algebra and differential equations, the topics including matrices and linear equations, determinants, vector spaces, linear transformations, eigenvalues and eigenvectors, first-order linear differential equations, n^{th} order linear differential equations, systems of linear differential equations.

Prerequisites

0701M230 Calculus II

Required Textbook(s)

Edwards, Penney, *Calvis*. *Differential Equations and Linear Algebra*, 4th Edition, Pearson.

You will need to purchase an access code for MyMathLab. The cost for one term is about \$74.99 or more. This comes with an e-book, so it is optional to purchase the physical textbook.

Course Schedule

The schedule gives an overview of the major concepts in this course. Numbers listed before each section refer to the related textbook chapters/sections.

Week 1:

- 1.1 Differential Equations and Mathematical Models
- 1.2 Integrals as General and Particular Solutions
- 1.3 Slope Fields and Solution Curves
- 1.4 Separable Equations and Applications
- 1.5 Linear First-Order Equations
- 1.6 Substitution Methods and Exact Equations
- 3.1 Introduction to Linear Systems
- 3.2 Matrices and Gaussian Elimination
- 3.3 Reduced Row-Echelon Matrices

Week 2:

- 3.4 Matrix Operations
- 3.5 Inverses of Matrices
- 3.6 Determinants
- 4.1 The Vector Space \mathbb{R}^3
- 4.2 The Vector Space \mathbb{R}^n and Subspaces
- 4.3 Linear Combinations and Independence of Vectors
- 4.4 Bases and Dimension for Vector Spaces

END OF MIDTERM MATERIAL

Week 3:

MIDTERM (1.1 - 1.6, 3.1 - 3.6, 4.1 - 4.4)

- 6.1 Introduction to Eigenvalues
- 6.2 Diagonalization of Matrices
- Supplemental Material: Introduction to Linear Transformations
- Supplemental Material: The Matrix of a Linear Transformation

Week 4:

- 5.1 Introduction: Second-Order Linear Equations
- 5.2 General Solutions of Linear Equations
- 5.3 Homogenous Equations with Constant Coefficients
- 5.5 Nonhomogeneous Equations and Undetermined Coefficients
- 7. 1 First-Order Systems and Applications

Week 5:

- 7.2 Matrices and Linear Systems
- 7.3 The Eigenvalue Method for Linear Systems

FINAL EXAM (6.1 - 6.2, Supplemental Material, 5.1 - 5.5, 7.1 - 7.3)

Grading Policy

Quizzes	25 %
Homework	15 %
Midterm Exam	30 %
Final Exam	30%
TOTAL	100 %

There will be a section of online homework for each section covered. Online homework will be due the day prior to the related exam's final due date. ***Online homework can be submitted late for half credit up until the last day of class.***

Each week, a cumulative "written homework" (quiz) assignment will be given, where students will be required to write out all work and submit written work and answers. ***Written homework cannot be turned in late, as the key will be posted so students may use it to study for the related exam.***

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.