Linear Algebra

Course # DMNS 2011

Credits 6

Pre-requisites and Co-requisites: Calculus I

Course Description

This course, Linear Algebra, provides students with a comprehensive introduction to the concepts and techniques of linear algebra. The course covers topics such as matrices, systems of linear equations, vector spaces, linear transformations, eigenvalues, eigenvectors, orthogonality, and least squares. The course is taught using a combination of lectures, examples, and hands-on problem-solving. By the end of the course, students will have a solid understanding of the fundamental concepts of linear algebra and will be able to apply these concepts to a wide range of problems.

Course Learning Outcomes

Upon completion of the course, students will be able to:

- Interpret systems of linear equations in several variables to understand the behavior of solutions in three-dimensional and higher-dimensional planes.
- They will develop algorithmic techniques to compute the inverse of high-dimensional matrices.
- Students will critically analyze and construct mathematical arguments related to foundational concepts in abstract vector spaces.
- They will integrate methods of matrix algebra to compose the change of basis matrix with respect to two distinct bases of vector space.
- Additionally, students will apply the characteristic polynomial to distinguish between diagonalizable and non-diagonalizable matrices by analyzing their spectra, including eigenvectors and eigenvalues.
- Lastly, they will analyze numerical data, mathematical concepts, and identify patterns to formulate and validate reasoning in economics and other applied sciences.

Course Assessments and Grading

Item	**Weight**
Homework	10%
Quizzes	15%
Project	15%
Group Project	10%
Midterm Exam	20%
Final exam	30%