



Introduction to Linear Algebra

This course covers the fundamental concepts and techniques of linear algebra, including vector spaces, linear transformations, and matrix operations. The primary goal is to provide a solid foundation for understanding the structure and properties of linear systems.

The course is divided into several key sections:

- Vector Spaces:** Definition, subspaces, linear independence, and bases.
- Linear Transformations:** Matrix representations, kernel, and range.
- Matrix Operations:** Addition, multiplication, and inversion.
- Eigenvalues and Eigenvectors:** Diagonalization and applications.
- Quadratic Forms:** Classification and optimization.

The course concludes with a comprehensive review of the material and an examination of the applications of linear algebra in various fields, such as physics, engineering, and computer science.