Marshall University

College of Science

MTH 331: Linear Algebra

Course catalog description

Vector spaces, matrices and determinants, linear transformations, eigenvalues and eigenvectors, and applications.

Credit hours

4 hours

Prerequisites

A grade of C or higher in MTH300.

List of topics

- Matrices and Systems of Linear Equations
- Linear Transformations and Their Inverses
- Images and kernel of a Linear Transformation
- Subspaces for and Their Dimensions
- Linear(Vector) Spaces
- The Matrix of a Linear Transformation
- Orthogonality
- Gram-Schmidt Process and QR Factorization
- Least Squares and Data Fitting
- Determinants and Their Properties
- Cramer's Rule
- Eigenvalues and Eigenvectors of a Matrix
- Diagonalization

Course objectives

- Students will learn about solving system of linear equations and applications
- Students will learn about Matrix Algebra and Vector Spaces
- Students will learn about Linear Transformations and their matrix representation

- Students will learn spanning, linear independence, bases and coordinates
- Students will learn inner product spaces and orthogonality
- Students will learn eigenvectors and eigenvalues
- Students will learn determinants and their properties

Suggested textbooks

- Linear Algebra with Applications, 9th edition, Steven Leon, ISBN: 978-0-321-96221-8
- Linear Algebra with Applications, 5E by Otto Bretscher
- Linear Algebra and its applications , 4th Edition , David Lay

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