Math 117 : Linear Algebra

California State University, Sacramento · Department of Mathematics & Statistics

Abstract linear spaces and linear transformations; invariant subspaces; canonical forms.

Catalog Description

Abstract linear spaces and linear transformations; invariant subspaces; canonical forms. **Graded**: Graded Student. **Units**: 3.0.

Prerequisites

Math 110A

Course Outline

I. Vecctor Spaces
   A. Bases
   B. Dimension
   C. Direct Sums

II. Matrices and Linear Mappings
   A. Linear equations
   B. Linear map associated with a matrix
   C. Changes of basis and similarity

III. Scalar Products
   A. Orthogonal bases
   B. Dual space

IV. Operators
   A. Bilinear forms and quadratic forms
   B. Symmetric operators
   C. Hermetian operators
   D. Unitary operators

V. Eigenvalues and Eigenvectors
   A. Characteristic Polynomial
   B. Triangulation
   C. Cayley-Hamilton Theorem

VI. Spectral Theorem
   A. For symmetric linear mappings
   B. For unitary mappings
   C. Jordan normal form