

SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
 SYLLABUS (*Tentative*)
 MATH 306 *Linear Algebra*

Objectives: To develop the theory of vectors, matrices, and inner products, with emphasis on concepts and techniques used in geometry and physics.

Prerequisite: A second course in Calculus (MATH 202).

Text: "Linear Algebra and Its Applications," by David C. Lay; Addison-Wesley Publishing Company, Third Updated Edition, 2006.

	Hours
Chapter 1 <i>Linear Equations</i> Systems of linear equations: existence, uniqueness, elementary row operations; Gauss-Jordan row reduction and echelon forms; vector equations; linear independence; linear transformations; applications of linear systems.	14
Chapter 2 <i>Matrix Algebra</i> Matrix operations; inverse of a matrix; characteristics of invertible matrices; subspaces of \mathbb{R}^n .	9
Chapter 3 <i>Determinants</i> Introduction to determinants; properties of determinants; Cramer's rule, volume, and linear transformations.	5
Chapter 4 <i>Vector Spaces</i> Vector spaces and subspaces; null spaces, column spaces, and linear transformations; linearly independent sets and bases; coordinate systems; dimensions of a vector space; rank.	6
Chapter 5 <i>Eigenvalues and Eigenvectors</i> Eigenvectors and eigenvalues; the characteristic equation; diagonalization, eigenvectors & linear transformations, complex eigenvalues..	7
Chapter 6 <i>Orthogonality and Inner Product</i> Inner product, length, and orthogonality; orthogonal sets; orthogonal projections.	6
<i>Optional Topics, Review, Tests, Group Work</i> Including, but not restricted to: Eigenvectors and linear transformations; complex eigenvalues; Gram-Schmidt process; least square problems; applications in computer graphics.	9
	56

EVALUATION

Tests	40-50%
Homework/Projects	20-40%
Final exam	20-30%

Writing Requirements: In presenting written solutions to exercises, students are to clearly communicate their thought process using mathematically correct language. Conclusions must be justified and clearly stated. All papers are expected to be neat, well organized, and easy to read. Students are expected to demonstrate the ability to communicate clearly and correctly both verbally and in writing using standard English and appropriate mathematical terminology.

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.