

**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, 5<sup>th</sup> Edition.

	<b>Hours</b>
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>	9
Including, but not restricted to: Eigenvectors and linear transformations; complex eigenvalues; Gram-Schmidt process; least square problems; applications in computer graphics.	56

**EVALUATION**

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

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.