

**HOSTOS COMMUNITY COLLEGE
DEPARTMENT OF MATHEMATICS**

MAT 320	LINEAR ALGEBRA with VECTOR ANALYSIS
CREDIT HOURS:	3.0
EQUATED HOURS:	3.0
CLASS HOURS:	4.5
PREREQUISITES:	Math 310 Calculus III, with C or higher
REQUIRED TEXTS:	Anton: <u>Elementary Linear Algebra</u>, 10th Edition. Publisher: Wiley 2005. Edwards & Penney, Calculus 6th Edition, Prentice Hall, 2002
REFERENCE TEXTS;	Grove: <u>Student Solutions</u>..... Wiley Publisher
DESCRIPTION:	The student will study matrix theory, linear equations, Gauss elimination, determinants, eigenvalue problems and first order systems of ordinary differential equations, vector field theory, theorems of Green, Stokes, and Gauss.
EXAMINATIONS:	A minimum of four partial tests and a comprehensive final examination.
GRADES:	A, A⁻, B⁺, B, B⁻, C⁺, C, D, I, F

MAT 320

COURSE OUTLINE

1. SYSTEMS OF LINEAR EQUATIONS:

- a. Basic Definitions (linear, no-linear, homogeneous.etc.)**
- b. Solve a System by means of Gaussian Elimination.**
- c. Matrix Operations (multiplication, addition, scalar mult.)**
- d. Definition and Calculation of Inverse Matrices.**
- e. Further results on Systems of Equations and Invertibility.**

11. DETERMINANTS:

- a. Define the Determinant Function**
- b. Evaluation of Determinants by Row Reduction**
- c. Properties of Determinants**
- d. Expansion of a Determinant as a Sum of Co-factors**
- e. Solution of Non-homogenous System by means of Determinants (Cramer's Rule)**

III INNER PRODUCT SPACES

- a. Inner Products**
- b. Angle and Orthogonality in Inner Product Spaces**
- c. Orthogonal Matrix, Change of Basis**

IV EIGENVALUE, EIGENVECTORS

- a. Eigenvalues and Eigenvectors**
- b. Diagonalization**
- c. Application to Differential Equations**
- d. Diagonalization Quadratic Forms; Conic sections**
- e. Quadratic Surfaces**

MAT 320

COURSE OUTLINE

V SURFACES IN \mathbb{R}^3

- a. Arc Length**
- b. Curvature of a Plane**

VI VECTOR CALCULUS

- a. Vector Fields**
- b. Line Integrals**
- c. The Fundamental Theorem of Line Integrals**
- d. Green's Theorem**
- e. Divergence Theorem**
- f. Stokes' Theorem**