



BASIC LINEAR ALGEBRA

21:640:219 (3 credits)

COURSE DESCRIPTION:

Solving linear systems and Gauss-Jordan elimination; matrix algebra, determinants; vectors, affine transformations in the plane; applications to linear programming, economics and computer graphics; eigenvalues and eigenvectors.

PREREQUISITE:

21:640:119 (Basic Calculus), or 21:640:135 (Calculus 1), or 21:640:155 (Honors Calculus 1), or permission of instructor.

IMPORTANT NOTE:

Credit NOT given for both 21:640:219 (Basic Linear Algebra), and 21:640:350 (Linear Algebra.) Intended for students majoring in business, social science, information systems, or liberal arts.

Mathematics majors and minors will NOT receive credit for 21:640:219.

TEXTBOOK:

"Linear Algebra & Its Applications," (5th edition), by David Lay, published by Pearson.

DEPARTMENT WEB SITE: <http://www.ncas.rutgers.edu/math>

THIS COURSE COVERS THE FOLLOWING CHAPTERS AND SECTIONS:

1.1-1.2 Matrices and systems of linear equations, Gauss-Jordan elimination

2.1-2.3 Matrix operations, symmetric matrices

2.4, 3.1, 3.2 Inverse of a matrix, determinants, properties of determinants

3.3, 3.4 Calculating determinants, determinants and matrix inverses

4.1,4.2 Euclidean space as a vector space, dot product, norm, angle, distance

4.3 General vector spaces

4.4-4.7 Subspaces, linear combinations, linear dependence and independence, basis and dimension

4.8, 4.9, 5.1, 5.3 Rank of a matrix, orthonormal vectors and projections, eigenvalues and eigenvectors, diagonalization of matrices

6.1-6.3 Linear transformations, matrix transformations, kernel and range

6.4-6.6 Linear systems via transformations, coordinate vectors, linear transformations via matrices

7.1 Inner product spaces

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