MATHEMATICS 132

LINEAR ALGEBRA II

Text: *Linear Algebra, Third Edition*, by J. Fraleigh and R. Beauregard

Further topics in linear algebra beyond those covered in Math 131 and 113, including eigenvalues, Hermitian and unitary matrices, positive definite matrices and canonical forms.

TOPICS	SUGGESTED NO. OF WEEKS' COVERAGE
Eigenvalues and eigenvectors (§§ 5.1–5.3)	$1\frac{1}{2}$
Orthogonalization, perpendicular projections, least squares (§§ 6.1–6.5)	$2\frac{1}{2}$
Change of basis (§§ 7.1–7.2, 4.4)	1
Linear algebra with complex coefficients (§§ 9.1–9.4)	2
Diagonalization of quadratic forms (§ 8.1)	1

Eigenvalues and eigenvectors . . . . . $1\frac{1}{2}$
(§§ 5.1–5.3)

Basic definitions and methods for determining eigenvectors and eigenvalues, diagonalization, applications to computing powers of matrices and systems of linear differential equations.

Orthogonalization, perpendicular projections, least squares . . . . . $2\frac{1}{2}$
(§§ 6.1–6.5)

Projections, the Gram-Schmidt orthonormalization process, orthogonal matrices, the projection matrix, the method of least squares.

Change of basis 1
(§§ 7.1–7.2, 4.4)

Coordinatization and change of basis, matrix representations and similarity, linear transformations and determinants.

Linear algebra with complex coefficients 2
(§§ 9.1–9.4)

The algebra of complex numbers, matrices and vector spaces with complex scalars, eigenvalues and diagonalization, Jordan canonical form.

Diagonalization of quadratic forms 1
(§ 8.1)

This outline leaves substantial time for catching up and/or review.