MATHEMATICS 131

LINEAR ALGEBRA I

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

An introduction to vector spaces, matrices, and solutions of systems of linear equations. Only one of Math 113 and 131 may be taken for credit.

TOPICS	SUGGESTED NO. OF WEEKS' COVERAGE
Vectors, matrices and systems of linear equations (§§ 1.1–1.6)	$1\frac{1}{2}$

Euclidean vectors, norm and dot product, matrices and their algebra, solving systems of linear equations, inverses of square matrices, homogeneous systems, their solution subspaces and bases for the latter.

Dimension, rank and linear transformations (§§ 2.1–2.4)	2

Independence and dimension, the rank of a matrix, linear transformations of Euclidean spaces, specialization to the plane.

Vector spaces (§§ 3.1–3.5)	$2\frac{1}{2}$

The abstract notion of a vector space, generalization of linear algebraic concepts from ordinary vector algebra, coordinatization of vectors, linear transformations, inner product spaces.

Determinants (§§ 4.1–4.4)	1

2×2 and 3×3 determinants and their relations to areas, volumes and cross products, the determinant of a general square matrix, compuations of determinants and Cramer's rule.

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