

CALIFORNIA STATE UNIVERSITY, SACRAMENTO
Department of Mathematics and Statistics

SYLLABUS

Math 104: Vector Analysis

Prerequisite: Math 32

This is a one-semester upper division course that is taught only in the spring. It is a continuation of the topics in Math 32 and is highly recommended for all math majors whose concentration is in Applied Math. It is also recommended for Physics and Engineering majors.

OUTLINE:

- I. Vector Algebra 3-4 Weeks
 - a. Definitions
 - b. Addition and subtraction
 - c. Scalar multiplication
 - d. Applications in geometry
 - e. Equations of a line
 - f. Dot product
 - g. Equation of a plane
 - h. Cross product
 - i. Triple scalar product

- II. Vector Functions of a Single Variable 2-3 Weeks
 - a. Differentiation
 - b. Curves, velocities, and tangents
 - c. Acceleration and curvature
 - d. Planar motion in polar coordinates

- III. Scalar and Vector Fields 3 Weeks
 - a. Level surfaces
 - b. Gradient
 - c. Vector fields and flow lines
 - d. Divergence
 - e. Curl
 - f. Laplacian

