

San Francisco State University
Department of Mathematics
Course Syllabus

MATH 350
Geometry

Prerequisites

Math 228 and Math 301 or consent of instructor.

Bulletin Description

Introduction to the origin and foundations of geometry; Euclidean, non-Euclidean, more recent approaches. Quick survey of high school geometry. Classification and representation of motions and similarities. Projections, homogeneous coordinates.

Course Objectives

Students are introduced to the basic properties of axiomatic systems and investigate different axiomatic approaches to Euclidean geometry. Students gain an historical perspective of plane geometry by reviewing high school geometry, by proving more advanced results of Euclidean geometry (e.g., Ceva's theorem) and by exploring basic concepts of non-Euclidean and projective geometry as time permits. Students study transformational approaches to plane geometry, including the classification of motions and applications to symmetry patterns. Students may use *Geometer's Sketchpad* software to explore and discover geometric relationships (e.g., the altitudes of a triangle are concurrent). The course provides an overview of geometry suitable for mathematics majors who plan to teach in secondary school.

Evaluation of Students

Instructors typically use a combination of frequent, graded homework assignments (including *Geometer's Sketchpad* activities), quizzes, midterm exams, and a final exam to evaluate students.

Course Outline

The following timeline is approximate.

Introduction to Axiomatic Systems	2 weeks
Euclidean Geometry	6 weeks
Transformational Geometry	4 weeks
Other Topics (as time permits, chosen from non-Euclidean and projective geometry)	3 weeks

Textbooks and Software

David C. Kay, *College Geometry: A Discovery Approach* (2nd edition),
Addison Wesley.

James T. Smith, *Methods of Geometry*, John Wiley.

Edward C. Wallace and Stephen F. West, *Roads to Geometry* (2nd edition),
Prentice Hall.

Geometer's Sketchpad software is installed on the computers in the
Mathematics Department Computer Lab (TH 404). Students may purchase
Geometer's Sketchpad from Key Curriculum Press.

Submitted by: Bob Marcucci

Date: May 28, 2003