
CREDITS: 3

COURSE DESCRIPTION: Development of a logical discourse, betweenness properties and plane separation, geometric models of axiomatic systems, modern geometry of triangle and circle, transformations (linear, circular), orthogonal systems of circles, elliptic and hyperbolic geometry. Prerequisite: MATH-151 Calculus with Precalculus B or MATH-153 Calculus I or MATH-156 Calculus and Analytic Geometry I.

TEXTBOOK: College Geometry: A Discovery Approach, 2nd Ed., by Kay (adopted S05)
Previous:
Modern Geometries, 5th Ed., by Smart (adopted S01; 4th Ed. adopted S97)
Introduction to Geometry, 2nd Ed., by Coxeter

COURSE OBJECTIVES:
1. To provide the student attempting a major or minor in mathematics, an intermediate step between the rigor of analysis and the methods of calculus.
2. To introduce rigor by presenting the subject of geometry amidst an axiomatic structure known as the properties of Euclidean Space.
3. To present, in the framework of 1 and 2, geometry as a branch of contemporary mathematics involving the study of geometric systems.

COURSE OUTLINE:
1. Foundations of Mathematics
2. Development of Geometry from Mathematical Models
   A. Modern Geometry of the Triangle
   B. Modern Geometry of the Circle
   C. Circular Transformations and Orthogonal Systems of Circles
3. Hyperbolic and Elliptic Geometry
   A. Non-Euclidean Geometries in the Euclidean Plane
   B. Hyperbolic Trigonometry of the Right Triangle
   C. Circles, Limit Curves, and Equidistant Loci
   D. Bolyai-Lobachevski Non-Euclidean Geometry