Objectives: This course focuses on Euclidean and Non-Euclidean geometry with an emphasis on students’ abilities to construct proofs and communicate mathematics verbally. Two further goals of the class are to have the students develop self-reliance in the study of geometry and develop an appreciation for the role of geometry in history and culture.

Intended Audience: This course is intended for prospective mathematics teachers and mathematics majors.

Prerequisites: MATH 210 and some experience writing proofs.


Topics

Geometry Through the Ages
Greek Geometry, Euclid, Neutral Geometry, Famous Problems

Topics in Euclidean Geometry
Constructions, Axiom Systems, Formal Geometric Proof

Other Geometries
Parallelism, Hyperbolic Space

Transformational Geometry
Analytic Model of the Euclidean Plane, Linear Transformations of the Plane

Projective Geometry
Perspective and Projective Geometry, The Cross Ratio

Tests and Optional Topics
Fractal Geometry, Other Geometries

EVALUATION

Projects, Presentations, Homework 25-50%
Tests (2 or 3) and Final Exam 50-75%

Graduate students will be assigned special homework/test problems or projects.

NOTE: Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.