



September 2008

MATH 442 Euclidean Geometry

1. Catalog Description

MATH 442 Euclidean Geometry (4)

Foundations of Euclidean geometry, finite geometries, congruence, similarities, polygonal regions, circles and spheres. Constructions, mensuration, the parallel postulate. Appropriate for prospective and in-service mathematics teachers. 4 lectures. Prerequisite: MATH 248 with a grade of C- or better or consent of instructor. Recommended: MATH 300 or familiarity with dynamic geometry software.

2. Required Background or Experience

Math 248 with a grade of C- or better. Math 300 recommended.

3. Learning Objectives

The student should develop an appreciation of:

- Axiomatic systems.
- Geometric constructions by compass and straightedge and with dynamic geometry software.
- Neutral geometry.
- Euclidean geometry.
- The meaning of types of proof.
- The historical background of geometries.

4. Text and References

Greenberg, Marvin J., Euclidean and Non-Euclidean Geometries, 4th ed., W. H. Freeman & Co., New York, 1993.

Reynolds, B., and W. Fenton, College Geometry Using the Geometer's Sketchpad, Key College Press, 2006.

Wallace, Edward C., and Stephen F. West, Roads to Geometry, 3rd ed., Pearson-Prentice Hall, 2004.

5. Minimum Student Materials

Paper, pencils, notebook, compass, straightedge, and geometry dynamic software.

6. Minimum University Facilities

Classroom or lab with ample chalkboard space, overhead projector, and computers.

7. Content and Method

<u>Topic</u>	<u>Lectures</u>
Axiomatic systems and their properties	6
Finite geometries	2
Axioms for incidence geometry	6
Neutral geometry	5
Congruence conditions	2
Parallel postulate	2
Saccheri-Legendre theorem	1
Properties of Euclidean geometry	6
Euclidean geometry	4
Activities using dynamic geometry software	4
	38
Total	

Method

Lecture and discussion, student-presented solutions of problems and demonstrations of theorems, and dynamic geometry software activities.

8. Methods of Assessment

Homework, quizzes, constructions, activities, oral presentations, and exams.