Course Outline

Department of Mathematics
and Statistics

Minnesota State University, Mankato

Math 332 College Geometry (4 semester hours)

Course Description:

This course covers several geometric systems including Euclidean, non-Euclidean, transformational and projective. Other topics studied are topological properties and the relationship between coordinate and synthetic geometry.

Prerequisites: MATH 290 with “C” (2.0) or better or consent

Course Objectives:

The student will be able to:

1. Use the axiomatic method to prove concepts of Euclidean and non-Euclidean geometry.
2. Teach the concepts seen in an high school geometry course.
3. Be familiar with the differences between different forms of geometry, such as Euclidean, Hyperbolic and Projective.
4. Be able to use software such as Geometers’ Sketchpad to illustrate geometric results.

Content Outline:

1. The Axiomatic Method – The concept of axioms, proofs from axioms and known results.
2. Foundations of Geometry – Points, lines, segments, angles, polygons, circles, as well as constructions with straight-edge and compass.
3. Neutral Results – Geometric results which can be proved without the parallel postulate.
4. Euclidean Geometry – Consequences of the parallel postulate for triangles, rectangles, parallel lines, etc. Euclid’s results in defects in his methods.
6. Non-Euclidean Geometry – Hyperbolic, projective, spherical or other geometries.

Textbook/Related Readings/Materials:

Geometric software such as Geometers' Sketchpad.
Wallace and West, Roads to Geometry, (3rd Edition)
Kay, College Geometry: A Discovery Approach (2-