

**Date Prepared:** August, 2003

## **COURSE OUTLINE**

X New \_\_\_ Revised

**Effective Date:** Fall 2003

1. **COURSE PREFIX NUMBER:** MTH 295 **CREDIT HOURS:** 3
2. **COURSE TITLE:** Euclidean and Non-Euclidean Geometries
3. **PREREQUISITES:** MTH 163 or equivalent
4. **COURSE DESCRIPTION:** A survey of the mathematical development and history of Euclidean and Non-Euclidean Geometries and their effects on mathematics and science. Lecture 3 hours per week.
5. **CONTENT:** (Major Headings)
  - a. Euclid's geometry
  - b. Logic and Proof
  - c. Hilbert's Axioms
  - d. Neutral Geometry
  - e. Non-Euclidean Geometry

### **6. GENERAL COURSE OBJECTIVES:**

Upon successful completion of the course, the student will be able to

- a. Use proper proof technique within the confines of Euclidean Geometry.
- b. Use proper proof technique within the confines of Neutral Geometry, including the alternate interior angle theorem, the Saccheri-Legendre Theorem, and equivalences to the parallel postulate.
- c. Use proper proof technique within the confines of various Non-Euclidean Geometries including hyperbolic geometry, the Beltrami-Klein models, and Poincare models.
- d. Understand the development and history of geometry from ancient times, through Euclid, the development of Non-Euclidean geometries, Einstein, and string theory and how it has affected man's relationship with mathematics, science, and philosophy.