Minnesota State University Moorhead

MATH 487: Foundations of Geometry

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites:
This course requires either of these prerequisite categories
1. Both of these
   MATH 327 - Introduction to Linear Algebra
   MATH 323 - Multi-Variable and Vector Calculus

   Or
2. All of these three
   MATH 327 - Introduction to Linear Algebra
   MATH 323 - Multi-Variable and Vector Calculus
   MATH 311 - Introduction to Proof and Abstract Mathematics

Corequisites: None

MnTC Goals: None

Systems of geometry such as Euclidean, non-Euclidean, coordinate, synthetic, transformational and projective. Models in geometric systems.

B. COURSE EFFECTIVE DATES: 05/02/2006 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Axiomatic Systems
2. Finite Geometries
3. Euclidean and Non-Euclidean Geometries
4. Transformational Geometry
5. Projective Geometry

D. LEARNING OUTCOMES (General)

1. Understand the components of an axiomatic system.
2. Understand the difference between synthetic and metric geometry.
3. Be able to determine whether a geometric model satisfies a geometric system.
4. Understand neutral geometry and the differences between Euclidean and non-Euclidean geometries.
5. Be able to use a matrix model to represent and classify transformations of the Euclidean plane.
6. Understand the role of the principle of duality in the projective plane.
7. Be able to use dynamic geometry software to make constructions that illustrate geometric concepts.
8. Construct coherent mathematical proofs

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted