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 323 - Multi-Variable and Vector Calculus

MATH 327 - Introduction to Linear Algebra

Or

2. 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

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G. SPECIAL INFORMATION

None noted

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