Course Title. Geometry for Elementary Teachers
Course No. MAT 132 No. of Credits. 4
Contact hrs/week. Lecture/Discussion 4 or Lecture 3/ Lab 2.

Course prerequisites. A grade of C or better in MAT 105 or MAT 108, or two years of high school algebra and one year of high school geometry, or cons. instr.

Catalog description: The course emphasizes geometric concepts. Topics also may include concepts of algebra, probability and statistics. Four hours lecture or three hours lecture and two hours laboratory per week. Prereq: a grade of C- or better in MAT 105 or MAT 108, or two years of high school algebra and one year of high school geometry, or cons. instr.

Course content (list of topics normally covered):
- NCTM Curriculum and Evaluation Standards
- Geometric Shapes
  - Recognizing Geometric Shapes and Definitions
  - Analyzing Shapes
  - Properties of Geometric Shapes: Lines and Angles
  - Regular Polygons and Tessellations
  - Describing Three-Dimensional Shapes
- Measurement
  - Measurement with Non-standard and Standard Units, including Unit Conversion
  - Length and Area
  - Surface Area
  - Volume
- Geometry Using Triangle Congruence and Similarity
  - Congruence of Triangles, including formal proofs using the three postulates
  - Similarity of Triangles
  - Standard Euclidean Constructions – e.g., Construction of an angle bisector, perpendicular bisector, parallel and perpendicular lines given a line and a point not on it, circumscribed and inscribed circles.
  - Problem Solving Using Triangle Congruence and Similarity
- Geometry Using Coordinates
  - Distance and Slope in the Coordinate Plane
  - Equations and Coordinates
  - Problem Solving Using Coordinates
- Geometry Using Transformations
  - Transformations
  - Congruence and Similarity Using Transformations
  - Geometric Problem Solving Using Transformations
Content-based department proficiencies:

Students should be able to

- Describe, model, draw, compare and classify geometric figures;
- Visualize and represent geometric figures with special attention to developing spatial sense; build and manipulate mental representations of two- and three-dimensional objects;
- Understand and apply geometric properties and relationships;
- Represent and solve problems using geometric models and a variety of strategies;
- Predict the results of combining, subdividing, and changing shapes, while working with projections, cross-sections, rotations, reflections, and translations;
- Classify figures in terms of congruence and similarity and apply these relationships;
- Understand and apply the attributes of length, capacity, weight, perimeter, area, volume, and angle measure;
- Understand the idea of a unit and the need to select a unit appropriate to the attribute being measured, understanding that measurements are approximate and that different units affect precision;
- Know the standard systems of units;
- Make and use measurements in problem and everyday situations; make and use estimates of measurement;
- Communicate geometric ideas, knowing technical vocabulary and understanding the power of precise mathematical terminology;

Colleges-wide proficiencies assigned to course:

Students should be able to demonstrate the following:

A. Analytical skills Performance Indicators: Students should be able to:
1. Interpret and synthesize information and ideas.
4. Select and apply scientific and other appropriate methodologies.

B. Quantitative skills Performance Indicators: Students should be able to:
1. Solve quantitative and mathematical problems.
2. Interpret graphs, tables, and diagrams.

Recommended Software: The Geometer’s Sketchpad, Cabri, or Logo Turtle Graphics

Representative textbooks used for the course: (editions change over time)

- Geometry for Teachers by Collier

Approved April 22, 2006