

MA 1433

Informal Geometry and Measurement

Credit: 3 semester hours

Catalog Description: Three hours lecture. Measurements, informal geometry, and right angle trigonometry. (For Elementary and Special Education majors only. Prerequisite: a C or better in both MA 1413 and MA 1423)

Conceptual Framework: This course is designed to give pre-service elementary school teachers a basic knowledge and understanding of geometry and measurement.

Instructional Objectives:

1. The student will gain an understanding of basic geometric terms.
2. The student will be able to make a connection between algebra and geometry.
3. The student will be able to identify and create three-dimensional geometric figures.
4. The student will be able to identify pairs of congruent and similar triangles.
5. The student will be able to construct basic geometric shapes using a compass and a straight edge.
6. The student will be able to use the Pythagorean Theorem to find a missing side of a right triangle.
7. The student will be able to solve problems using right angle trigonometry.
8. The student will be able to compute the linear measurement around a closed planar geometric figure.
9. The student will be able to compute the area of a closed planar geometric figure.
10. The student will be able to compute the surface area of a three-dimensional figure.
11. The student will be able to compute the volume of a three-dimensional figure.
12. The student will be able to perform basic transformations of geometric figures.
13. The student will be able to use tessellations to investigate and predict the results of

changing shapes.

Topics To Be Covered:

1. Introducing Geometry – 14 hours
 - a. Basic definitions
 - b. Coordinate geometry
 - c. Polygons
 - d. Angle measurements
 - e. Three-dimensional geometry
2. Right Triangle Trigonometry – 5 hours
 - a. Definitions
 - b. Applications
 - c. Pythagorean Theorem
3. Measurement – 14 hours
 - a. Linear measurement of planar figures
 - b. Area of planar figures
 - c. Surface Area of three-dimensional figures
 - d. Volume of three-dimensional figures
4. Constructions, Congruence, and Similarity – 8 hours
 - a. Properties of congruent triangles
 - b. Properties of similar triangles
 - c. Basic compass and straight edge constructions
5. Motion Geometry – 4 hours
 - a. Transformations
 - b. Tessellations

Suggested Student Activities:

The students will be placed in groups during the first class meeting. These groups can be used for study groups. They will be used for group projects (and for the Problem Based Learning cases). It is the responsibility of each student to get to know the other members of his or her group and establish contact times. These groups can be beneficial to all of the members if the students put forth the necessary effort.

Methods of Instruction:

This course is primarily a lecture course. There will be several group projects and possible cases to be explored through Problem Based Learning. There will also be some hands on activities. The students will learn to use a calculator and software called Geometer's Sketchpad.

Text:

Mathematics for Elementary School Teachers. 2nd edition. O'Daffer, Charles, Cooney, Dossey, Schielack. Addison Wesley Publishers.

SAMPLE