

Geometry Topics for Elementary Teachers

Math 2010

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1.0 Course Description

- 1.1 Overview:** This course includes geometry topics and their conceptual development as they relate to what is taught in the elementary classroom. Topics include polyhedra, polygons, symmetry, tessellation, size changes, planar curves and curved surfaces, measurement and rigid motions.
- 1.2 For whom course is intended:** This course is designed to meet the needs of those students who will be elementary classroom teachers.
- 1.3 Prerequisite:** Completion of Math 2000 with a C or better.
- 1.4 Unusual circumstances:** This course will be offered during the same semester that students will enroll in a Field Experience. Their Field Experience will focus on mathematics in the elementary classroom they will be observing. In addition, they will be working individually with students and interviewing them regarding their understandings of mathematics. This information will be discussed within the Math 2010 classroom.

2.0 Objectives

- 2.1** Students will understand the underlying concepts necessary to teach geometry topics within the elementary classroom.

3.0 Content and Organization

1. Polyhedra
2. Polygons
3. Symmetry
4. Tessellations
5. Size Changes
6. Congruent Polyhedra
7. Planar Curves & Curved Surfaces
8. Measurement
9. Rigid Motions

4.0 Teaching Methodology

- 4.1 Methods of Instruction:** This course is to be taught in a manner that has increased emphases on images, ideas, reasons, goals, and relationships. The focus is to be on the big ideas, to realize that mathematics is not about getting answers to questions, but rather about developing insight into relationships and structures. Students will be engaged in complex problems to develop deep understanding, instead of meaninglessly memorizing procedures for solving them.
- 4.2 Student role in the Course:** Students must attend and participate in class and complete outside projects and activities. Students will be required to do extensive writing. To demonstrate mastery of a concept,

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students must be able to organize ideas and understandings. Explanations of work must be complete, conceptual, and coherent. Assignments will contain both questions and activities, some completed individually and some within small groups.

- 4.3 **Contact Hours:** 3 hours/week plus 6 hours/week outside of class for homework, projects and activities as assigned.

5.0 Evaluation

- 5.1 Evaluation will be based on student performance on projects, class assignments, tests, and classroom participation.
- 5.2 Classroom tests and assignments will represent approximately 80% of the course grade. 20% of the grade will be for projects and activities outside of class.
- 5.3 Grading scale:
A+: 98-100% B+: 86-88% C+: 76-78% D+: 66-68% F: Below 60%
A : 93-97% B : 83 – 85% C : 73-75% D : 60-65%
A-: 89-92% B-: 79-82% C-:69-72%

6.0 Resource Material

- 6.1 **Possible Texts:**
- 6.1.1 *Shapes and Measurements*, Judy Sowder, San Diego State University
Mathematics for Elementary School Teachers, 2nd ed., Bassarear, Houghton-Mifflin
Mathematics for Elementary Teachers, 4th ed., Bennett & Nelson, WCB McGraw-Hill
Mathematics for Elementary School Teachers, O’Daffer, Charles, Cooney, Dossey, & Schielack, Addison-Wesley
- 6.2 Other Suggested Readings: *Curriculum and Evaluation Standards for School Mathematics*, National Council of Teachers of Mathematics, 1989
- 6.3 Other sources: Internet and supplemental activities