SYLLABUS: GEOMETRIC MEASURE AND TRANSFORMATIONS
Math 383.01; 3 credit hours,
Spring 2008

INSTRUCTOR: Dr. Mark Klespis
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Office Hours: MWF: 10:30 – 11:30 AM
                       TTh: 9:00 – 9:30 AM; 2:00 – 3:00 PM
                       & by appointment
CLASSROOM AND SCHEDULE: Tuesday and Thursday, 12:30 - 2:00 PM; LDB 424

COURSE DESCRIPTION:

This course is an upper level mathematics course for prospective middle school mathematics teachers and can be applied only toward middle school teaching certification. Students are expected to practice communications skills and participate in hands-on activities, including the use of math manipulatives and technology. Topics will include National and Texas standards for teaching mathematics, measurement in one, two, and three dimensions, the metric system, transformational geometry, congruences, similarities, geometric constructions, and coordinate systems. The four main themes recommended by the NCTM Principles and Standards (problem solving, reasoning, communication, and connections) will be emphasized throughout this course. Students will also participate in class discussions and group work during this course. Prerequisite: Mathematics 185 and Math 285 or Math 142 with a grade of C or better. 3 semester hours.

COURSE OBJECTIVES:
- Upon completion of this course, students will be able to:
- Select and use appropriate units of measurement (e.g., temperature, money, mass, weight, area, capacity, density, percents, speed, acceleration) to quantify, compare, and communicate information
- Develop, justify, and use conversions within measurement systems
- Apply dimensional analysis to derive units and formulas in a variety of situations (e.g., rates of change of one variable with respect to another) and to find and evaluate solutions to problems
- Describe the precision of measurement and the effects of error on measurement
- Apply the Pythagorean theorem, proportional reasoning, and right triangle trigonometry to solve measurement problems
- Use the properties of congruent triangles to explore geometric relationships and

prove theorems
- Describe and justify geometric constructions made using a compass and straight edge, reflection device, patty paper, and other appropriate technologies
- Apply knowledge of the axiomatic structure of Euclidean Geometry to justify and prove theorems
- Use and understand the development of formulas to find lengths, perimeters, areas, and volumes of basic geometric figures
- Apply relationships among similar figures, scale, and proportion and analyze how changes in scale affect area and volume measurements
- Use a variety of representations (e.g., numeric, verbal, graphic, symbolic) to analyze and solve problems involving two- and three-dimensional figures such as circles, triangles, polygons, cylinders, spheres, and prisms
- Analyze the relationships between three-dimensional figures and related two-dimensional representations (e.g., projections, cross-sections, nets) and use these representations to solve problems
- Use Geometer's Sketchpad dynamic software to visually show geometric relationships and to develop classroom discovery lessons
- Use translations, reflections, glide-reflections, and rotations to demonstrate congruence and to explore the symmetries of figures
- Use dilations (expansions and contractions) to illustrate similar figures and proportionality
- Use symmetry to describe tessellations and shows how they can be used to illustrate geometric concepts, properties, and relationships
- Apply concepts and properties of slope, midpoint, parallelism, and distance in the coordinate plane to explore properties of geometric figures and solve problems
- Apply transformations in the coordinate plane
- Use the unit circle in the coordinate plane to explore properties of trigonometric functions

TEXT AND MATERIALS:

Serra, M. (2003), Discovering Geometry: An Investigative Approach (3rd Ed) Key Curriculum Press

Geometer's Sketchpad software, Key Curriculum Press (packaged with Serra textbook in bookstore)

GRADING:

Grades for this course will be based on a percentage of the number of points you have earned divided by the total points possible.

Grades will be assigned for the following areas:
- Three exams, weighted 100 points each
- Assignments (in class/out of class) – 150 to 200 points (estimated)
- 2 Projects - 60 points each
- Journal – 20 points
- Comprehensive final exam - 200 points

A letter grade will be assigned based on the following:

A: 90% or more of total possible points

B: 80 to 89% of total possible points

C: 70 to 79% of total possible points

D: 60 to 69% of total possible points

F: Less than 60% of total possible points.

ATTENDANCE/PROFESSIONALISM:

Regular and punctual attendance is expected of every student. As a prospective teacher, you must demonstrate your reliability and conscientious attitude by your faithful attendance. Students who miss more than two classes (three hours) during the semester may be assessed a point penalty, up to one letter grade for severe attendance problems. Attendance will be taken every class. If you are late to class, it is your responsibility to let me know immediately after the class that was missed. Unless approved by the instructor, leaving class early will count as an absence. If absent or tardy, you are still responsible for all material covered in class, and you will need to check with a classmate about what was discussed. Serious health or family problems that are well documented will be handled individually. _However, if you are unable to attend class regularly, you should drop the course._

In addition to attending class faithfully, students are expected to put forth their best effort in this class.   If you do not participate in class discussions, are sleeping in class, or are talking when I am talking or when a classmate is talking, you are not demonstrating the professional attitude required to be a teacher.

TESTS AND ASSIGNMENTS:

Tests will include problems that are similar to problems assigned and worked in class. A portion of each test will include multiple choice or short answer problems. A

second portion of each test will include problems where students must show all of their work correctly, as well as arrive at the correct solution.

Unless approved by the instructor prior to the date of a test, there will be no make-up for a missed test. If a student misses a test, then the percent grade on the final exam will be used. A missed final examination can be made up only by approval of the Dean of the College of Arts and Sciences or a higher administrative official.

In class and out of class assignments will be collected for grades. Late assignments do not exist.) Two Geometer's Sketchpad projects will also be required.

You are also expected to keep a journal for this class. Specific information will be supplied on a different document.

THE FINE PRINT

Academic Dishonesty: Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. See Student Syllabus Guidelines.

Classroom Rules of Conduct: Students are expected to assist in maintaining a classroom environment that is conducive to learning. Students are to treat faculty and students with respect. Students are to turn off all cell phones while in the classroom. Under no circumstances are cell phones or any electronic devices to be used or seen during times of examination. Students may tape record lectures provided they do not disturb other students in the process.

Student Absences on Religious Holy Days: Students are allowed to miss class and other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Students remain responsible for all work. See Student Syllabus Guidelines.

Students with Disabilities Policy: It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should visit with the Office of Services for Students with Disabilities located in the Counseling Center.

Visitors in the Classroom: Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not

present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

The Sam Houston Writing Center: The Sam Houston Writing Center, located in Farrington 111, provides one-on-one help with your writing assignments. The Center is open from 8 a.m. to 7 p.m. Monday through Thursday, 8 a.m. to 3 p.m. Friday, and 2-7 p.m. on Sunday. It is not necessary to schedule an appointment; however, you may call 936-294-3680, twenty-four hours in advance to schedule one.