SYLLABUS FOR MAT 411

Section I: MAT 411, Geometry

Catalog Course Designation
MAT 411/511. GEOMETRY. Intuitive, synthetic, and analytic approaches to Euclidean and other geometries. Prerequisite: MAT 205. 3

Introduction
This course is the geometry course that is required for certification to teach secondary school mathematics. It is designed to give the prospective teacher the necessary background to teach Euclidean geometry and an awareness and understanding of deductive systems in mathematics through the study of non-Euclidean geometries resulting from changes in the Euclidean parallel postulate. Some familiar geometric topics will be studied from synthetic and analytic approaches.

Section II: Conceptual Framework

“The purposes of the Department of Mathematics are to prepare teachers of mathematics for the elementary and secondary schools, to provide a foundation for professional careers in mathematics, and to provide for the mathematical needs of the general student,” (2005-2006 Delta State Bulletin). This view of education supports the College of Education’s Conceptual Framework Delta Model which is based on Performance, Professionalism, and Preparation of candidates to become the educators that are needed not only in the delta, but also throughout the state and nation.

The Conceptual Framework can be found at:
http://www.deltastate.edu/docs/math/ConceptualFramework.pdf

Section III: General Course Objectives
At the conclusion of this course, the student should be able to do the following:

1. Recognize patterns of thought and describe their importance in both the sciences and in everyday experiences.
2. Describe the structural nature of geometry.
3. Develop an awareness and understanding of deductive systems in mathematics.
4. Recognize proofs as an example of good deductive reasoning and write proofs to demonstrate deductive thinking.
5. Recognize geometric relationships and develop geometric models to use in solving application problems.
6. Develop geometric relationships based on a set of axioms and postulates.
7. Identify some weaknesses in Euclid's geometry and describe results of work by other mathematicians in correcting those weaknesses.
8. Identify and describe two non-Euclidean geometries resulting from changes in the Euclidean parallel postulate.
9. Demonstrate the interrelationship of the different branches of mathematics.

Section IV: Content to be Studied

B. Content Topics
1. Problem solving, geometric shapes and measurement
2. Reasoning and triangle congruence
3. Parallel postulate and its consequences
4. Construction
5. Circles
6. Similarity
7. Transformations
8. Non-Euclidean geometries

C. Technology

The NCTM Standards called for an increase in open exploration and conjecturing and increased attention to topics from transformational geometry. The Geometer’s Sketchpad is a powerful learning tool to use in meeting the Standards. The following are some examples of the use the Sketchpad.
1. To locate the incenter, circumcenter, orthocenter, and centroid of a triangle.
2. To construct an Euler line.
3. To construct a nine-point circle.

D. Diversity

Students must demonstrate knowledge of the historical development of Euclidean and non-Euclidean geometries including contributions from diverse groups.

Section V: Specific Course Objectives

At the conclusion of this course, the student should be able to do the following:

1. Identify and apply several problem solving strategies.
2. Name the components of a deductive system.
3. Find surface area and volume of important three-dimensional shapes such as prisms, pyramids, cylinders, cones, and spheres.
4. Derive perimeter and area formulas for common polygonal regions.
5. Prove the Pythagorean Theorem and identify relationships in special right triangles.
6. Describe and use several methods of proving triangles are congruent.
7. Rewrite a statement in if-then form, then write the converse, inverse, and contrapositive.
8. Use compass and straightedge to do basic constructions.
9. Give 3 forms of the parallel postulate and identify a mathematician with each.
10. Describe and prove relationships for special quadrilaterals.
11. Prove triangles similar.
12. Use similar triangles in solving problems.
13. Know and use relationships involving chords, secants, and tangents of a circle.
15. Describe the importance of the three geometries in the world today.
16. Use Sketchpad to complete constructions.

Section VI: Major Course Activities
1. Mastery of subject matter in the textbook and supplementary materials provided by the instructor.
2. Completion of daily assignments as given by the instructor.
3. Completion of three tests.
4. Completion of a comprehensive final examination.
5. Have a compass and straightedge available during class and for completion of homework.
6. Participation in class discussions.
8. Participate in cooperative group activities.

Section VII: Methods of Instruction
1. Oral presentation/demonstrations by students................................................10% of time
2. Lecture/demonstration........................................................................20% of time
3. Class discussion................................................................................40% of time
4. Cooperative group activities..............................................................30% of time

Section VIII: Evaluation and Grading
1. Daily assignments................................................................................16 2/3 %
2. Three tests (each test will will the 16 2/3 % of the final grade)..............50 %
3. Final examination................................................................................33 1/3 %

Grading Scale
Grades will be assigned according to the following scale: A (94-100), B (84-93), C (74-83), D (65-73), F (below 65).

Assigned homework exercises that reinforce subject matter will be collected, graded, and returned. The semester homework average will comprise 16 2/3 % of the final grade. Unless you are notified otherwise, homework will be assigned daily from the attached assignment sheet. It is your responsibility to keep up and know which assignment is due. No credit will be given for answers only unless we have agreed to that prior to collection of the assignment. If you do not have your homework, you will get a zero for the assignment. If you are absent, you may turn in the homework along with an excuse for the absence. You may not send your homework on the days that you choose to cut class.

Do not fold any papers (homework/tests) that you turn in. You may write on the back of the page.

A comprehensive final examination will be given on December 10 at 8:00 a.m. As you make plans for the Christmas holidays be aware that you must be here that day. Writing assignments will be an integral part of the course in the form of a question on a test or a class exercise that requires you to provide a written explanation of a concept.
Section IX: General course Information

A. Attendance
Prompt and regular attendance is necessary for success in this course. In order to receive credit in this course, a student must attend a minimum of 75% of the class meetings. No more than 11 total absences, excused and unexcused, will be allowed. If you exceed that number, you will be assigned a grade of "F" as the final grade in the course. To be counted present, you must arrive on time for class and remain in class the entire time. Late arrivals will not be admitted to class. Any absence from scheduled work must be covered by an excuse (doctor's or official university) before you are allowed to make-up work. Make-up of missed work is the student's responsibility. All make-up work must be completed within one week of your return to class.

B. Cheating and plagiarism
Cheating and plagiarism are not tolerated. If it is established that a violation has occurred, the penalty will be a zero on the test or paper in question.

C. Important Dates
Students who remain in the course after September 16 and who elect to drop the course will receive a grade of W if passing or F if failing the course at the time of the drop. A drop is not effective and complete until the drop slip has been signed by all parties designated on the drop slip and turned in to the Registrar's Office. No course on campus may be dropped after November 10. If you plan to audit this course, you must notify me by August 26.

Section X: Disabilities
Special arrangements can be made for a student with a documented clinically diagnosed physical or learning disability. The student should inform the instructor of any documented disability necessitating special provisions.

Instructor: Dr. Rose Strahan e-mail: rstrahan@deltastate.edu
Office: Walters 270A Office Phone: 846-4505 Home Phone: 843-8123
Office Hours: Monday, Wednesday, Friday -- 9:00-10:00, 11:00-12:00, 1:00-4:30 Tuesday, Thursday -- 9:30-11:45, 1:30-4:30