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.

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.

Content to be Studied
1. Problem solving, geometric shapes and measurement
2. Reasoning and triangle congruence
3. Parallel lines and quadrilaterals
4. Similarity
5. Circles
6. Transformations
7. Non-Euclidean geometries

Major Student 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.

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

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

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.

A comprehensive final examination will be given on December 6 at 8:00 a.m. As you make plans for the Christmas holidays be aware that you must be here on December 6.

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. Evaluation of your response will include mathematical content, spelling, grammar, and sentence construction. You will also have writing projects, which may include reading and summarizing mathematics articles.

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.

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

**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).

**Important Dates**
Students who remain in the course after **September 19** 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 9**. If you plan to audit this course, you must notify me by **August 28**.

**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.

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**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
MAT 411/511 Assignments

1. page 29  exercises 1-11
2. pages 90-1  exercises 1-20
3. pages 160-1  exercises 1-19, 21-24
4. pages 173-4  exercises 19, 24, 26, 31, 32
5. pages 186-7  exercises 37, 39, 41, 42, 43
6. pages 195-6  exercises 7, 8, 9, 11, 13, 18
7. pages 205-6  exercises 11, 12, 19, 20, 25, 26, 27, 28

**TEST CHAPTERS 1 through 4**
8. pages 226-7  exercises 18, 29, 30, 31, 32, 36, 40, 41
9. pages 233-4  exercises 22, 23, 24, 25, 26
10. pages 244-5  exercises 24, 28, 29, 30, 37, 41, 42
11. pages 253-4  exercises 35, 36, 37, 38, 46, 48
12. pages 261-2  exercises 3, 6, 10, 11,18, 19

**TEST CHAPTER 5**
13. pages 288-90  exercises 9, 11, 12, 14, 21, 23, 26, 27, 29, 40
14. pages 298-300  exercises 27, 28, 29, 31, 32, 35, 36 38

**TEST CHAPTER 6**
15. pages 336-7  exercises 1-17 odd
16. pages 327-9  exercises 25-238
17. pages 360-1  exercises 2, 6, 9, 11, 14
18. **Chapter 9: Transformation Geometry**
19. Handout on transformations using coordinates
20. Handout on transformations by compass and straightedge constructions

**TEST CHAPTER 9 AND TRANSFORMATIONS**
22. Handouts

**FINAL EXAMINATION – Wednesday, December 6, 8 a.m.**