Math 533 - Topics in Euclidean Geometry
Course Syllabus

Instructor  Donald R. Cole  129 Lyceum; Regular Office Hours: 8:30 a.m. – 10:30 a.m. M - Th plus After Class appointments; dcole@olemiss.edu; (915-1713) 4:30 p.m. – 5:45 p.m. Jackson Center Room 111

Text Book  Elementary Geometry from an Advanced Standpoint (by Edwin Moise; ISBN 0-201-50867-2)

Course Description  This is a comprehensive study of geometry. It includes the historical development of geometry, abstract and concrete treatments of the subject, examples of various geometries, proving geometric theorems, solving geometric problems, and applications. This is a senior level class. Students are required to have earned a C or better in Calculus III and Linear Algebra. Juniors and students who have not fulfilled this requirement are asked to drop unless given special permission from the instructor.

Objectives  This course is designed to be a reading and writing course. The text is designed to be covered in one semester. We will cover as many topics as possible, allowing for maximum learning of the subject and appreciation of the text. Students will be required to lecture. Chapters 8 and 9 will be reading assignments. Chapter 14 is omitted. The student should know the statement of the theorems in these chapters. Chapter 18 will be supplemented with a lecture on polyhedral and groups of symmetries.

Teaching Method  This is a lecture course. Many of the lecture theorems will be assigned to the students. Students will assigned lecture topics from the text for class presentation that will be evaluated as part of the course grade.

Examinations  There will be two to three examinations and a final examination. There are no make-up or extra credit examinations. The student is held responsible for all material covered during his or her absence. Quizzes may be given, announced or unannounced.

A Code of Ethics  The greatness The University of Mississippi is completely determined by the members of its community. If each student and teacher regards his role with high esteem and honor, then Ole Miss will be among the greatest institutions in the nation. Creating a great institution is a cooperative venture. We must all perform at our level best. This means that teachers do their best in teaching and professing. Students prepare all assignments and tests with their greatest writing skills and thought. Students must attend class and participate in classroom discussions, showing respect for fellow classmates and teacher. Students must use the class to learn to become professional. Always be on time and leave when class has been dismissed. Respect the buildings and campus by not littering, eating or drinking in classroom buildings. Maintain a positive and mature attitude.

Academic Dishonesty  Cheating is not tolerated. Anyone found cheating on examinations or quizzes will receive F for the course.

Learning Outcomes  The student successfully completing this course will be able to have an understanding and appreciation of the basic vocabulary used in geometry today, be able to explain the historical evolution and a historical significance of this vocabulary give several alternatives to Euclid’s fifth postulate coherently explain at least one model of a “Non-Euclidean Geometry” have an appreciation of how the material relates to other mathematics courses demonstrate how Geometry led to the axiomatic approach to mathematics
know and appreciate the fundamental postulates and theorems associated with Euclidean Geometry

**Disability Access and Inclusion:** The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course that result in barriers to your full inclusion and participation, or to accurate assessment of your achievement, please contact the course instructor as soon as possible. Barriers may include, but are not necessarily limited to, timed exams and in-class assignments, difficulty with the acquisition of lecture content, inaccessible web content, and the use of non-captioned or non-transcribed video and audio files. If you are approved through SDS, you must log in to your Rebel Access portal at [https://sds.olemiss.edu](https://sds.olemiss.edu) to request approved accommodations. If you are NOT approved through SDS, you must contact Student Disability Services at 662-915-7128 so the office can: 1. determine your eligibility for accommodations, 2. disseminate to your instructors a Faculty Notification Letter, 3. facilitate the removal of barriers, and 4. ensure you have equal access to the same opportunities for success that are available to all students.

**Evaluations** The final grade will be determined as follows:

Examinations
Assignments, quizzes, and
Student lectures

The grading scale is as follows:

- 90% and above: A
- 80%-89%: B
- 70%-79%: C
- 60%-69%: D
- 59% and below: F

**Disclaimer:** Parts of this syllabus is subject to change or modification; topics are subject to modification depending on mathematical maturity of the class. Changes will be announced in class.

**(Approximate) Topical/Test Outline**

**Test One**

Fields
Order relations and ordered fields
Induction Principle
Integers and Rational Numbers
Archimedian Postulate; Euclidean Completeness
Set Theory and Incidence Geometry in planes and space
The distance function
Betweeness
Segments, rays, angles, and triangles
Congruence of segments
Convexity and the Plane Separation Postulate
Angular measure
Congruences between triangles
The SAS Postulate

**Test Two**

Geometric inequalities
Examples of Geometries
Euclid's Geometry
The Poincare model for Lobachevskian geometry
The spherical model for Riemannian geometry
The Parallel Postulate and parallel projection
The comparison theorem The Basic Similarity Theorem
Proportionalities
Similarities between triangles
The Pythagorean Theorem
Circles
Solid Geometry
How to do algebra with ruler and compass
Solving equations with ruler and compass

Graduate Students vs. Undergraduate Students

This course may be taught in a class containing both graduate and undergraduate students. The graduate student will be assigned additional work in the form of library assignments, completing details of certain proofs, collaboration with other departmental professors, additional presentations, and additional papers assigned for completion; Exams may contain additional problems. All graduate students will be required to complete a project from an assigned list.
Contact information for staff at each regional campus.

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