SYLLABUS

Course: MAT 6551 Modern Geometry
Text: none

Catalog Description:
MAT 6551 Modern Geometry **Credit, 3 sem. hrs.**
Prerequisites: 18 semester hours of mathematics

A review of topics in Euclidean geometry and an intuitive introduction to non-Euclidean geometries.

Rationale for Course: This course allows graduates students in mathematics to examine the topics that form the foundation of both Euclidean geometry and non-Euclidean geometry. The course is particularly useful for those who teach geometry at the secondary level as it allows them to examine a broad range of approaches to thinking about geometric concepts. Note that there is no textbook; all the theorems will be proven by the students themselves. Unlike an undergraduate course in geometry, the students will not be reading and trying to understand proofs presented by an author. Rather the students will be provided with a set of postulates, definitions and theorems and will then make board presentations or submit written versions of their own proofs which they will have to defend regarding logical correctness. Since the proofs provided vary each time the course is taught, the direction of the course is also somewhat determined by what the students discover.

Learning Objectives: Upon successful completion of this course, the student will be able to:
-prove theorems based on initial postulates and previously proven theorems
-understand the notions of incidence geometry
-work with a distance function
-use angle measurement to prove geometric facts
-compare and contrast the metric and synthetic approaches to geometry
-work with Euclidean models of non-Euclidean geometries
-understand the parallel postulate choices and their effects on the resulting geometry
-work with similar polygons and proportionality
-prove a variety of theorems involving circles and lines
-use basic ideas of volume
-use Geometer's Sketchpad both as an exploration tool and to demonstrate geometric ideas
-find additional information on geometry via library and internet searches
-explain geometric ideas correctly in both oral and written forms

Academic Integrity: Honesty and integrity are basic virtues expected of all students at Mississippi College. The *Mississippi College Tomahawk* lists the policies and penalties for plagiarism and cheating. This information can also be found online by going to http://www.mc.edu/publications/policies/ and following the link to Policy 2.19.

Disability Accommodation: If you need special accommodations due to learning, physical, psychological, or other disabilities, please contact the Counseling and Career Development Center.

Learning Environment: The method of instruction will primarily involve student presentation of proofs of geometric theorems. In addition, conjectures involving geometric objects will be developed using Geometer's Sketchpad as a tool.

Assessment: Assessment of the student's progress will be made through classroom feedback on board presentations and written assessment by the instructor of proofs submitted in writing.
Makeup work is the responsibility of the student and should be cleared with the instructor in advance whenever possible. The college stipulates that the grade for the course is automatically an F in the event of 6 or more absences.