MTH 351.001, College Geometry
Department of Mathematics and Statistics
Class Policy Sheet and Syllabus—Spring 2019

Professor: Dr. Sarah T. Stovall
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Email: sstovall@sfasu.edu
Office Phone: 936.468.1684
Office Hours:

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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<td>9-11</td>
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Class Times & Place: 8-8:50 MWF, Room 213, Math Building

Course Policies:

Course description: We will be exploring the fundamentals of absolute geometry, beginning with axioms and proceeding from there. We will study a survey of topics from classical Euclidean geometry, modern Euclidean geometry, projective geometry, transformational geometry and non-Euclidean geometries.


Tentative Course Calendar: Please note that the dates for our in-class exams below are subject to change. The final is university scheduled and cannot be taken at a different time without permission of the Dean of the College of Sciences and Mathematics.

Exam 1 Friday, February 22
Exam 2 Wednesday, April 3
Final Monday, May 13, 8 – 10am, in our regular classroom

Course Requirements:

- **Two in-class exams**—If a student must miss an exam due to an excused absence, special arrangements should be made in advance. No cell phone or graphing calculators will be allowed on exams.

- **Geogebra Project**—We will have at least one project using the geometry software Geogebra.

- **Presentations**—Each student will present proofs in class at least twice during the semester. Proof presentations will be graded on correctness, ability to field questions and clarity of written display.

- **Proof Sets**—Submit proofs on loose-leaf paper. State your name, the problem and its number on the top of the first page for that problem followed by a clear, complete, logical solution to the problem.

- **A comprehensive final exam**—The final exam is Monday, May 13, 8 - 10am.

- **Class attendance policy and participation**—Let x be a natural number less than or equal to 4. Missing 5x classes will result in a 10x point reduction in your final average. Students are expected to attend all class meetings, arriving on time. If you are absent, you are responsible for determining what you missed and for being prepared for class when you return. Leaving class early without notifying the professor in advance will result in your being counted absent for the class session. Students that sleep in class, send or receive text messages, or conduct other online activities not directly related to class will be counted absent.

- **Homework**—Homework will consist of problem sets from the textbook; there may also be group assignments and some supplemental exercises. Homework problems will be assigned regularly at the beginning or end of class on the white board. I will not be grading homework, but attempting all homework is crucial for your understanding of the material. We will discuss any questions that you have from the previous homework assignment at the beginning of each class period.

- **Preparing for class**—Students should be prepared to invest several hours per day outside of class reading the text, practicing examples, and working homework exercises. Material to be discussed in class should be read before coming to class. Check your university email regularly, as I may send reminders, assignments, or announcements.

Grading Policy:

- 45% Exam 1 is 20%, Exam 2 is 25%
- 5% Geogebra Project
- 5% Presentations
- 15% Proof Sets
- 30% Comprehensive Final Exam

Grading Scale:

- 90% - 100%: A
- 80% - 90%: B
- 70% - 80%: C
- 60% - 70%: D
- Below 60%: F

The first page of this document is a synopsis for your quick reference of class policies, dates and contact information for MTH 351.001.

See [http://www2.sfasu.edu/math/docs/syllabi/MTH351Syllabus.pdf](http://www2.sfasu.edu/math/docs/syllabi/MTH351Syllabus.pdf) for elements common to all sections.
Course description: Survey of topics from classical Euclidean geometry, modern Euclidean geometry, projective geometry, transformational geometry and non-Euclidean geometries.

Credit hours: 3

The following is an excerpt from SFA Policy 5.4:

The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;

2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

Course Prerequisites and Corequisites: See general course prerequisites.

Course outline:

<table>
<thead>
<tr>
<th>Approximate time spent</th>
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<tr>
<td>Basic Definitions and Axioms 25%</td>
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<tr>
<td>Triangles, Quadrilaterals and Circles 25%</td>
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<tr>
<td>Euclidean Geometry 25%</td>
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<tr>
<td>Transformational Geometry 15%</td>
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- Basic Definitions and Axioms
  - Introduction to Axiomatic Systems and Proof
  - Role of Examples and Models
  - Incidence Axioms
  - Distance Axioms
  - Angle Axioms
  - Plane Separation Postulate

- Triangles, Quadrilaterals and Circles
  - Triangles, Congruence
  - SAS Axiom and Taxicab Geometry
  - ASA, SSS Congruence and Perpendicular Bisector Theorem
  - Inequality Theorems
  - Other Congruence Criteria (SsA, HA, HL, etc.)
  - Quadrilaterals
  - Circles (all results possible without accepting a parallel postulate)

- Euclidean Geometry
  - Euclidean Parallel Postulate, Rectangles
  - Parallelograms and Parallel projection
  - Similarity
  - Right Angle Trigonometry
  - Circles With a Parallel Postulate
  - Area And Volume

- Transformational Geometry
  - Reflections, Translations, Rotations and Other Isometries
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- Other Linear Transformations
- Non-Euclidean Geometry
  - Hyperbolic Geometry
  - Models for Hyperbolic Geometry
  10%

Academic Integrity
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

The penalty for a student found cheating on any part of an assignment, quiz, or exam in this class will range from a grade of zero on the work to a grade of F in the course, and may result in additional, more severe disciplinary measures. A student who allows another to copy his work and the student copying the work are both guilty of cheating. Do your own work. Do not show your completed work to others. Do not allow others to copy your work.

Definition of Academic Dishonesty (SFA policy 4.1):
Academic dishonesty includes both cheating and plagiarism. Cheating includes, but is not limited to:
- using or attempting to use unauthorized materials on any class assignment or exam;
- falsifying or inventing of any information, including citations, on an assignment;
- helping or attempting to help other student(s) in an act of cheating or plagiarism.

Plagiarism is presenting the words or ideas of another person as if they were one’s own. Examples of plagiarism include, but are not limited to:
- submitting an assignment as one’s own work when it is at least partly the work of another person;
- submitting a work that has been purchased or otherwise obtained from the Internet or another source;
- incorporating the words or ideas of an author into one’s paper or presentation without giving the author credit.

Withheld Grades Semester Grades (SFA Policy 5.5)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices.

Acceptable Student Behavior
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy 10.4). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.
Program Learning Outcomes: Students graduating from SFA with a B.S. Degree and a major in mathematics will:

1. Demonstrate Lower Order Cognition (LOC). Examples: remembering definitions, understanding how to interpret axioms, using axioms to make conclusions regarding angle measure or congruence for a particular geometric figure.


3. Demonstrate proficiency in communicating mathematics in a format appropriate to expected audiences (written, visual, oral).

Student Learning Outcomes (SLO): At the end of the semester, successful students will be able to:

1. Use axioms, definitions and given theorems to prove properties of a geometry. [PLO: 1,2,3]

2. Show how a model for a geometry can serve to prove independence of a set of axioms. [PLO: 1,2,3]

3. Prove two triangles are congruent under varying sets of hypotheses (the traditional SAS, SSS, ASA, AAS proofs). [PLO: 1,2,3]

4. Use the Inequality Theorems for triangles to establish relationships between measures of sides and angles of triangles. [PLO: 1,2]

5. Use the properties and proven theorems concerning circles to establish congruence of triangles. [PLO: 1,2,3]

6. Understand that the difference between absolute, Euclidean, hyperbolic, and other classical geometries is the parallel postulate (or absence of one), and that this difference is what establishes the independence of the Euclidean Parallel Postulate. [PLO: 1]

7. Use parallel projection and similar triangles to prove congruence of angles or constance of ratios of sides. [PLO: 1,2,3]

8. Use the Pythagorean Theorem, Law of Sines, Law of Cosines and right triangle trigonometry. [PLO: 1,3]

9. Use and write mappings which describe translations, rotations, and other geometric transformations. [PLO: 1,3]

10. Prove theorems in a geometry besides Euclidean geometry (usually hyperbolic geometry) to understand their dependence on the accepted axiom set. [PLO: 1,2,3]

Date of document: 01/23/2019