A. COURSE INFORMATION

Course number/section: MATH-3312.001
Class meeting time: TR 12:00-1:50 pm
Class location: OCNR 258, CI 222 (lab)
Course Website: bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Jordan Alexander
Office location: CI 213a
Office hours: MTWR 10:00-11:30am
Telephone: (361) 825-3613
e-mail: jordan.alexander@tamucc.edu
Appointments: email me to make an appointment to meet outside office hours

C. COURSE DESCRIPTION

Catalog Course Description
3 sem. hrs. (2:2)
A careful study of the foundations of Euclidean geometry by synthetic methods with an introduction to non-Euclidean geometries. An introduction to transformational geometry. Contains a laboratory component.

Extended Course Description
The world of geometry was rocked in the 1800s by mathematicians claiming that parallel lines were not as simple as Euclid had assumed. This sparked a revolution that led to a complete overhaul of the systematic development of Euclidean geometry, birthing new geometries such as the geometry Einstein would later use in his theory of general relativity. In this course, we walk through the foundational proofs of classical geometry, keeping an eye on when and how Euclid’s controversial Fifth Postulate is used in the process. We then recount the historical objections to Euclid’s system and the key thoughts that led to the development of new, non-Euclidean geometries.

D. PREREQUISITES FOR THE COURSE

Prerequisites
MATH 2413 and junior standing; MATH 3311 recommended.

Corequisites
MATH 3312 - 201 (lab)
E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

Optional Textbook(s) or Other References

Supplies
None

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the courses student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Discuss the concept of axiomatic systems.
2. Prove some significant theorems from Euclidean geometry.
3. Describe the problem with Euclid’s fifth postulate.
4. Explain the basic concept of non-Euclidean geometry.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Most class meetings will be centered around lecture. However, students will be asked to share insights and to contribute to the flow of the class.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Student learning outcomes will be measured in the 3 following ways:

1. Five homework assignments will be collected throughout the semester. Students should read the textbook and attempt to work on the homework problems before the corresponding topics are discussed in class. This will help you ask questions and engage in class discussion. It will also make it easier to solve the homework problems after those topics have been discussed.

2. Lab assignments will further develop students’ understanding of various topics discussed in class. Each lab is due at the beginning of the following lab meeting and will be graded on a 10-point scale for completion and correctness. The two lowest lab scores will be dropped.
3. **Three midterm exams** will be given during the semester, and a **final exam** will be administered on the regular final exam date scheduled by the university. Students will not be allowed to use calculators, phones, notes, or any other type of help during the exams. Studying for the exams will help solidify your understanding of key concepts developed in the class.

The following letter grades will be assigned to the associated range of final grades: 85.0 – 100 A; 70.0 – 84.99 B; 55.0 – 69.99 C; 40.0 – 54.99 D; below 40 F.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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</thead>
<tbody>
<tr>
<td>Homework (5)</td>
<td>25% (5% each)</td>
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<tr>
<td>Labs (10)</td>
<td>20% (2% each)</td>
</tr>
<tr>
<td>Regular Exams (3)</td>
<td>30% (10% each)</td>
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<tr>
<td>Final Exam</td>
<td>25% (25% each)</td>
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### I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Dates</th>
<th>Week</th>
<th>Topic</th>
<th>Chapters</th>
<th>Due Tues.</th>
<th>Due Thurs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/29 – 5/31</td>
<td>1</td>
<td>Foundational Concepts</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6/5 – 6/7</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6/12 – 6/14</td>
<td>3</td>
<td>Euclidean Geometry</td>
<td>2</td>
<td>HW 1</td>
<td></td>
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<tr>
<td>6/19 – 6/21</td>
<td>4</td>
<td>(without Postulate 5)</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6/26 – 6/28</td>
<td>5</td>
<td>(with Postulate 5)</td>
<td>2</td>
<td>HW 2, Exam 1</td>
<td></td>
</tr>
<tr>
<td>7/3 – 7/5</td>
<td>6</td>
<td>Postulate 5</td>
<td>4</td>
<td></td>
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<tr>
<td>7/10 – 7/12</td>
<td>7</td>
<td></td>
<td>4</td>
<td>HW 3, Exam 2</td>
<td></td>
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<tr>
<td>7/17 – 7/19</td>
<td>8</td>
<td>Possibly Non-Euclidean</td>
<td>5</td>
<td></td>
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<tr>
<td>7/24 – 7/26</td>
<td>9</td>
<td></td>
<td>5</td>
<td>HW 4, Exam 3</td>
<td></td>
</tr>
<tr>
<td>7/31 – 8/2</td>
<td>10</td>
<td>Hyperbolic Geometry</td>
<td>6</td>
<td>HW 5</td>
<td></td>
</tr>
<tr>
<td>8/3</td>
<td></td>
<td>Final Exam</td>
<td>Fri. 8/3</td>
<td>12:00-1:50 pm</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

### J. COURSE POLICIES

**Attendance/Tardiness**

Punctual class attendance is highly recommended.
Late Work and Make-up Exams
If a student misses an exam, the student’s grade on the final exam will serve as a replacement for the missed exam.

Late homework, labs and exploration assignments will receive a 5% penalty for each regular weekday that they are late (up to the last day of class).

Long term illness and official university business are the only exceptions to these rules.

Extra Credit
There is no extra credit given in this course. Just study diligently throughout the semester.

Cell Phone Use
Please turn off cell phones before class starts. I will ask any student with their phone out to turn it off and put it up. If this happens multiple times with the same student, I will ask the student to leave class.

Laptop Use
Please do not open laptops during class. This can distract others from learning, and part of my job is to provide a class atmosphere that aids student learning.

Food in Class
Please do not eat during class. This can distract others from learning, and part of my job is to provide a class atmosphere that aids student learning.

Missed Exam
See “Late Work and Make-up Exams” above.

Participation
Strong, consistent class participation is expected from all students.

K. COLLEGE AND UNIVERSITY POLICIES

• Academic Integrity (University)
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating - for example, illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a grade of zero, and an academic misconduct form will be filed.

• Classroom/Professional Behavior
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior
that interferes with either (a) the instructors ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility** Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)** The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar at http://www.tamucc.edu/academics/calendar/ for the last day to drop a course.

- **Deadline for Dropping a Course with a Grade of W (University)** I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar at http://www.tamucc.edu/academics/calendar/ for the last day to drop a course.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of
their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/

- Statement of Academic Continuity
In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M UniversityCorpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. OTHER INFORMATION

- Academic Advising
The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The Colleges Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.