MATH 3312 College Geometry
Department of Mathematics and Statistics
Spring 2020

A. COURSE INFORMATION

Course number/section: CRN 21697 MATH 3312.001
              (Lab) MATH 3312.201
Class meeting time: Online class session
              Thursday (laboratory) 9:00AM-11:00AM  CCH 204
Course Website: TAMU-CC Blackboard https://bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Celil Ekici, PhD
Office location: CI-312
Office hours: MWR 9:00am-11:00AMpm and by appointment
Telephone: (361) 825-2819 (office)
e-mail: celil.ekici@tamucc.edu

Appointments: Please email me, and include information about your availability.

C. COURSE DESCRIPTION

A careful study of the foundations of Euclidean geometry by synthetic methods with an
introduction to non-Euclidean geometries. An introduction to transformational geometry.

D. PREREQUISITES AND COREQUISITES

Prerequisites: MATH 2413 and junior standing; MATH 3311
recommended.
Co-requisites: Requires registration in lab.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required text: You will be supplied materials in the blackboard as primary materials.
The course materials are mainly drawn from NSF funded *The Mathematics of Doing, Understanding, Learning, and Educating for Secondary Schools [MODULE(S^2)]* project.


**Supplemental References** A central aim of this course is to help you learn to **develop your own ideas** about mathematical questions. You therefore are not expected to consult any reference materials outside of the provided course materials in developing your geometrical ideas during this course. • *The First Six Books of the Elements of Euclid* by John Casey and Euclid can be accessed from [http://www.gutenberg.org/](http://www.gutenberg.org/). Other references may be provided by instructor, as needed. It will be the students’ responsibility to find and access the recommended works. Visit [http://rattler.tamucc.edu/asklib/ask.php](http://rattler.tamucc.edu/asklib/ask.php) for help.

**Supplies** You need to bring your set of compass and ruler for constructions during the first weeks. Regular access to high speed internet and Microsoft Office applications (e.g., Word, Power Point). **Software:** GeoGebra (free- Download GeoGebra classic instead of cloud version to be able to work without internet using more features) or Geometer’s Sketchpad, Version 5: It can be purchased for $10.56 by calling McGraw-Hill at (800) 338-3987 and requesting to purchase the Student, 1-year license (ISBN 9780021408382) or [https://www.mheducation.com/prek-12/program/MKTSP-HGA01M0.related.html?page=3&sortby=relevance&order=desc&bu=seg](https://www.mheducation.com/prek-12/program/MKTSP-HGA01M0.related.html?page=3&sortby=relevance&order=desc&bu=seg) Labs will have the old version of Geometer’s sketchpad (GSP) on all computers.

**F. STUDENT LEARNING OUTCOMES AND ASSESSMENT** Content Standards: Through whole-class instruction, cooperative learning groups, student to class presentations, and hands-on activities with concrete materials and computer software, by the end of this course, students will:

- Demonstrate genuine understanding of fundamental concepts of Euclidean and non-Euclidean geometries.
- Demonstrate knowledge of the roles of definitions, axioms, proofs in geometry.
- Demonstrate understanding of the fundamentals of solid, coordinate, and transformational geometries.
- Apply problem-solving skills to geometric situations including triangles, quadrilaterals and circles.
- Enhance spatial skills by constructing, transforming and modeling figures.
- Demonstrate the ability to formulate conjectures and to prove geometric generalizations.
- Use GeoGebra (2d and 3d) or Geometer’s SketchPad (GSP) for dynamics modeling,
construction, experimentation with geometric objects and their relationships.

**Process Goals** (based on the Standards for Mathematical Practice from the Common Core State Standards): Students will

- make sense of problems and persevere in solving them.
- reason abstractly (representing quantities symbolically and manipulating those symbolic representations) and quantitatively (attending to the meaning of quantities).
- use appropriate tools (e.g. manipulatives, calculator, dynamic geometry softwares) strategically to solve mathematical problems in euclidean and non-euclidean geometry.
- Students will develop and extend understanding through active communication (reading, writing, speaking, and listening) of mathematics, attending to precision of math language.
- Students will construct viable mathematical arguments and critique the reasoning of others.

Topics for discussion includes but not limited to:

- Undefined terms, definitions, postulates, axioms, and theorems as they relate to Euclidean and non-Euclidean geometries.
- The formulation of generalizations: Proofs using formal and informal methods.
- Concepts involving congruency and similarity.
- Measurement involving two- and three-dimensional shapes.
- Constructions with compass, straightedge, MIRA, and Geometer's Sketchpad

**G. INSTRUCTIONAL METHODS AND ACTIVITIES**

The course will be a combination of lectures, whole-class discussions, and many individual investigations of geometry. The heart of the instructional method for this course is student activity. Students will be challenged to solve many problems from the text, and communicate their solutions. Students will be required to give individual or group presentations. If needed, there will be alternative assignments in lieu of presentations. All participants are expected to engage in group and whole class activities by contributing knowledge and thoughtful evaluation of others’ contributions.

**H. MAJOR COURSE REQUIREMENTS AND GRADING**

Grades will be based on the percentage of total points the student earns. There will be points given on the following:

<table>
<thead>
<tr>
<th>ACTIVITY/ASSIGNMENT</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Participation (Online &amp; lab- Including engagement)</td>
<td>%10</td>
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<tr>
<td>Mid-term Exams and Quizzes</td>
<td>%20</td>
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<tr>
<td><strong>Portfolio</strong></td>
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<tr>
<td>1. Homworks, Proof Writing and Reflections</td>
<td>%20</td>
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<tr>
<td>2. Group Projects</td>
<td>%20</td>
</tr>
<tr>
<td>3. Online Reflections and Blackboard Discussion Forum</td>
<td>%5</td>
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<tr>
<td>Final Exam (comprehensive)</td>
<td>%25</td>
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Coming to class session prepared and actively participating in lab activities and Blackboard Discussion Forum, learning each lesson and doing the homework on time will contribute to your success in this class. Quizzes will be unannounced, and contain 1-3 problems from the current topics. There will be about 7-8 quizzes, two of them with the lowest grades will be dropped. Specific directions for course activities/assignments (e.g., content, format, submission, deadlines, feedback) will be announced in class and/or posted on TAMUCC-Blackboard, at https://bb9.tamucc.edu/. Throughout the semester you will gather selected pieces of your work and write reflections on your learning through that work. The collection of work will be submitted electronically as a portfolio at the end of the semester. You will have a portfolio entry submission link in blackboard. Multiple submissions will be allowed for your portfolio entries to submit update. The papers and presentations (power point and oral presentations) will be graded both by the instructor and two peers, using the following rubric

**Grading Rubric:**

*Category 4 Exemplary  3 Good 2 Satisfactory 1 Unsatisfactory*

**Subject knowledge 50%**

4 Demonstrates subject knowledge throughout the entire assignment. All information is clear, appropriate, and accurate. The solutions to all problems are correct.

3 Demonstrates subject knowledge most of the time. Most of the information is clear, appropriate, and accurate. Most of the solutions to problems are correct, some solutions have minor errors.

2 Demonstrates some subject knowledge. Some information is clear, appropriate, and accurate. Some solutions to problems are correct.

1 Subject knowledge is not demonstrated. Information is confusing, insufficient, inappropriate, and inaccurate. Most of the problems have incorrect solutions.

**Organization 30%**

4 The sequence of information/proof is logical and well organized.

3 The sequence of information/proof is well organized.

2 Some parts of the sequence of information/proof is organized.

1 The sequence of information/proof is disorganized.

**Communication (written paper, and/or ppt and oral presentation) 20%**

4 Excellent written communication of ideas/ excellent integration of spoken and visual presentation.

3 Good written communication of ideas, most of the time/good integration of spoken and visual presentation, most of the time.

2 Some parts are well written, and ideas are communicated effectively / some parts of the presentation are coordinated orally and visually.

1 The written paper is hard to follow, ideas are not communicated effectively / the presentation is hard to follow, the spoken and visual presentation are not integrated.

**Final grades will be assigned according to the following table:**

*Percentage Grade* If Grade ≥90.0% - A; if Grade ≥80.0% - B; if Grade ≥70.0% - C; if Grade ≥60.0% - D; if Grade, Below 60% F.
## I. COURSE CONTENT/SCHEDULE

Timeline Topics Chapters/Sections ASSIGNMENTS

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<thead>
<tr>
<th>Week 1</th>
<th>Introduction to Geometry and GeoGebra/Geometry Sketchpad</th>
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<tr>
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<td>Discussion Forum (Topics: Syllabus, Introductions)</td>
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<tr>
<td>Week 2</td>
<td>Definitions, Axiomatics and Proofs, and Models</td>
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<td>What is Geometry Axiomatic Systems: Straightness</td>
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<td>Exploring Geometry Discussion Forum (Topic: Axiomatic Systems: Chapter 1 Exploring Lines and Distance Geometry)</td>
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<td>Week 3</td>
<td>Axiomatic Systems: Discussion Forum (Topics: Incidence Chapter 2 Foundations of Geometry Geometry 1, Flatland Part 1)</td>
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<td>Week 4</td>
<td>Axiomatic Systems: Parallels Assignment presentations Discussion Forum (Topic: Incidence)</td>
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<td>Week 5</td>
<td>Axiomatic Systems: Parallels Discussion Forum (Parallel)</td>
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<td>Week 6</td>
<td>Transformational Geometry Midterm Review Discussion Forum (Topic: Midterm Review) Midterm Exam Midterm</td>
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<td>Week 7</td>
<td>Transformational Geometry Discussion Forum (Topics: Flatland Part 2)</td>
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<td>Week 8</td>
<td>Spring Break No Class</td>
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<td>Week 9</td>
<td>Transformational Geometry</td>
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<td>Applets, Discussion Forum (Topics: Euclidean Geometry)</td>
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<td>Week 10</td>
<td>Transformational Geometry Discussion Forum (Topic: Euclidean Geometry)</td>
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<td>Week 11</td>
<td>Transformational Geometry Transformations Discussion Forum (Topic: Transformations)</td>
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<td>Week 12</td>
<td>Similarity and Area</td>
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<td>Applets, View Tubes Discussion Forum (Topic: Transformations)</td>
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<td>Week 13</td>
<td>Similarity and Area Non-Euclidean Geometry Discussion Forum (Topic: Non-Euclidean Geometry)</td>
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<td>Project/Transformations Presentation due</td>
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<tr>
<td>Week 14</td>
<td>Similarity and Area Non-Euclidean Geometry Discussion Forum (Topic: Non-Euclidean Geometry)</td>
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<td>Week 15</td>
<td>Final review</td>
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<td>Discussion Forum (Topic: Final Review) Thursday May 7th 4:30 – 7:00 p.m.</td>
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Final Exam (comprehensive)
I. Important Dates:

January 20, Monday Martin Luther King, Jr. Holiday – Campus Closed
January 28, Tuesday Last day to register or add a class
March 4-25, Wednesday-Wednesday Mid-Term Grading
March 9-13, Monday-Friday Spring Break
March 12-13, Thursday-Friday Campus Closed
April 10, Friday Last day to drop a class
April 16, Thursday Last day to apply for Spring graduation
May 6, Wednesday Last day of classes
May 7, Thursday Reading Day
May 8, Friday; Final examinations
May 11-14, Monday-Thursday
May 15-18, Friday-Monday Grading days
May 16, Saturday Spring Commencement
May 19, Tuesday Spring grades due

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 You are expected to attend every class session, and arrive on time. There is no make up for class activities, you need to be present to participate. All the absences will be considered “unexcused” unless you have an exceptional situation (e.g., documented illness, family situation), and you email the instructor about it. You can meet some of the class expectations by reading & working through the class materials and notes posted on Blackboard, or by contacting a friend from class and requesting any materials & assignments that you have missed. All handouts and assignments will be posted in Blackboard.

Late Work and Make-up Exams Late assignments will not be accepted, unless exceptional circumstances prevent you from completing them. Extension of deadlines will be at the instructor’s discretion. Late assignments may result in partial or total loss of credit. There are NO make-ups for quizzes, exams, or in-class activities.

Extra Credit There may be extra credit offered for this course. This possibility will be announced and discussed in class. Cell Phone Use Please silence phones before coming to class. If you need to take a call, please go outside the classroom. Laptop Use In general,
you cannot use your laptops during class activities or exams. For special circumstances (e.g., presentations), or special needs, please talk with the instructor. **Food in Class** Refrain from bringing food to class. For special needs or occasions, please talk with the instructor.

**Missed Exam** Exceptional circumstances (e.g., documented illness, family situations) may be considered at the instructor’s discretion. **Participation** You are expected to come to class prepared every time, and participate in class activities.

**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, such as 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 failing grade.

**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 instructor’s 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 submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

**Grade Appeals (College of Science and Engineering)** As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

**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 University–Corpus 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 College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

M. 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.