**Sul Ross State University**
**Course Syllabus**
**MATH/MTH 5305 Advanced Geometry**
**Summer I 2026**

**Instructor**: Dr. Angela M. Brown
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**Office Hours:** MTWT 11-12, others by appointment
**Time and Place of Class Meetings:** Online

**Course Goals:**

- Enhance your understanding of the geometric properties of the plane, spheres and other surfaces through direct experience, group work, and problem-based learning.
- Using your understanding of these geometric properties to devise your own mathematical arguments and proofs.
- Challenging your existing notion of what mathematics is all about.

Overview: The primary aims of this course are outlined in the goals stated above. The course will be organized around a series of problems—from your text and others I will post.

We will cover chapters 1–6 and parts of 8–11, 15, 19, and 22. We will cover more if time permits including topics from fractal geometry (I will provide readings on fractals as supplements to the textbook).

I expect that many aspects of what we will do will be new for you. This course will be taught with an emphasis on writing and collaborative learning. Memorization and formulae will not be emphasized in this course. For most of the course problems, there is no one "right answer" that you will be trying to "find." You will see a diversity of approaches and proofs in class. You will also be asked to share your own findings.

**Materials:** The text, Experiencing Geometry Euclidean and Non Euclidean with History, third edition, by D. Henderson and D. Taimina, 2005, Prentice Hall. ISBN 9780131437487

- A problem folder or "portfolio."
- Software: The software package Geogebra will be used. You can either download the classic version or use the web version. Both are free, but you will need to submit your work with explanations
- A ball and some elastics, or a plastic sphere such as those available at craft shops. A cone and a cylinder, homemade or store-bought varieties to be discussed in class.
- Other inexpensive household objects as the need arises.

**Details About the Course:**

**Writing Assignments:** Writing Assignments (WAs) are the backbone of this class. You will be asked to write your individual solution to each problem presented in class. Expect at least 7 WAs, more if time permits. You are encouraged to discuss and work on the WAs in groups as we will often do in class, but each of you should always submit individual work. Turn in your WAs by the due date and you will get feedback, including comments and questions, to which you must respond by resubmitting, in an ongoing dialogue. You are free to either just respond to questions and comments or to completely rewrite the paper. All of your work must be kept in your portfolio (so you always submit older versions of your work with the new one). On each assignment, you will be allowed three drafts. After the submission of the final draft, the WA will be graded according to the criteria you find below (see EVALUATION CRITERIA). Each draft of every WA MUST satisfy the following list of minimal requirements. Papers which do not meet all of the minimal requirements will not be read.

Minimal Requirements for WAs:

1. The text of the paper must be legible. Please type the text of your papers and draw in the pictures by hand (or use Geogebra to draw pictures)
2. You must leave ample space for your instructor's comments and questions (about a three-inch column).
3. Papers must be submitted as part of your portfolio. Drafts should be grouped together and placed in order of most recent submission to first submission.
4. Papers must be free of mistakes in both grammar and spelling.

Evaluation Criteria for Writing Assignments:

Writing assignments will be graded in their commonly agreed final draft according to the following criteria, divided into two categories, broadly defined as CONTENT and FORM.

CONTENT

5

- The problem was brilliantly analyzed.
- All ideas and notions were fully explored.
- All questions raised in class were fully addressed.
- Challenging new questions were raised and/or independent investigations were carried on expanding the problem under examination.

4.5

- The problem was fully and successfully analyzed.

- All ideas and notions were fully explored.
- All questions raised in class were fully addressed.

4

- The problem was successfully explored.
- The main ideas and notions were mastered.
- Minor topics may not be adequately treated.
- Some minor questions raised in class were not addressed.
- The paper is free of major conceptual errors.

3.5

- The problem was sufficiently explored, although some minor conceptual errors might be present.
- Minor confusion might be present on some of the main ideas.
- Minor topics might be missing or not adequately treated.

3

- The problem was not sufficiently explored.
- Some of the main ideas and new notions may be missing or not fully treated.
- Substantial confusion may be present on some of the main ideas.
- Erroneous and/or unnecessary items might be present.

2.5

- The exploration of the problem was unsatisfactory.
- Most main ideas and concepts are missing or poorly presented.
- Questions from the instructor may have been ignored.
- Major errors are present.

2

- The exploration of the problem was very poor.
- Losing strategies may be used.
- Most main ideas and concepts are missing or erroneously presented.
- No effort to improve the paper between the drafts is visible.

1

- Minimal work was done on the problem.
- All ideas and concepts are missing or very poorly presented

FORM

5

- The paper has a solid logic structure.
- All claims are clearly motivated.
- All implications are clear.
- Terminology is always used appropriately.

4.5

- The logic structure of the paper is globally sound.
- Most claims are clearly motivated
- The main implications are clear.
- Terminology is used appropriately in most cases.

4

- The paper has a visible logic structure but it may contain some unnecessary, verbose or unclear passages.
- The main claims are clearly motivated.
- Most implications are clear.
- Terminology is used appropriately in most cases.

3.5

- The logic structure of the paper lacks rigor. It may be difficult to follow some of the presented arguments.
- It may contain unmotivated implications, several unnecessary passages.
- Terminology may at times be used incorrectly.

3

- The logic structure of the paper is unsatisfactory.
- Some arguments may be circular.
- It may contain confused passages.
- Correct terminology is not used or used mostly inappropriately.

2.5

- The logic structure of the paper is poor.
- Arguments and implications are missing or presented in a confused fashion.
- The use of correct terminology is poor.

2

- The logic structure of the paper is extremely poor.
- Arguments and implications are missing or presented in a very confused fashion.
- The use of correct terminology is almost non-existent.

1

- The paper is logically chaotic.
- No effort to clearly motivate assertions was made.
- The use of correct terminology is totally absent.

The scheme above and structure of the syllabus were adapted from the syllabi of Dr. Gian Mario Besana (Indiana University Northwest) and Dr. Kelly Gaddis (Buffalo State College). (Adapted from Dr. James Alvarez, University of Texas at Arlington)

**Computer Assignments:** Computer Assignments (CAs) will be used to supplement the material covered in class. Assignments are to be turned in on Blackboard. CAs will be graded on a 1-10 scale. Expect at least 2 CAs.

**Exams:** There will be two in-class quizzes and a final exam. Quizzes will be announced in advance and will pertain to a recent course topic. You will be free to use your portfolio and text for the quizzes. If you stay connected in the course and work to your potential, you will find the quizzes to be a welcome challenge rather than a cause for concern. The final exam is cumulative.

**Grades:**

Portfolio of Problems and CAs 80%
Quizzes 10%
Final Exam 10%

**Attendance Policy:** Students are expected to attend every class. Since this is an online class, this would mean showing regular attendance by logging in and completing assignments by the due date given.

You are expected to check your Sul Ross e-mail account. Absences due to school functions should be discussed with me ahead of time.

It is policy of the university to drop a student with a grade of "F" if 9 hours or more of class are missed. For this course that would be 1 1/2 weeks of not logging in.

**Americans With Disabilities Act:** SRSU Accessibility Services. Sul Ross State University (SRSU) is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact Ronnie Harris, LPC, Counselor, at 432-837-8203 or email ronnie.harris@sulross.edu. Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine. Texas, 79832.

**Counseling:** Sul Ross has partnered with TimelyCare where all SR students will have access to nine free counseling sessions. You can learn more about this 24/7/365 support by visiting Timelycare/SRSU. The SR Counseling and Accessibility Services office will continue to offer in-person counseling in Ferguson Hall room 112 (Alpine campus), and telehealth Zoom sessions for remote students and RGC students.

**Library Services:** The Bryan Wildenthal Memorial Library and Archives of the Big Bend in Alpine offer FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu/. Off-campus access requires logging in with your LobolD and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or by phone (432-837-8123).

No matter where you are based, public libraries and many academic and special libraries welcome the general public into their spaces for study. SRSU TexShare Cardholders can access additional services and resources at various libraries across Texas. Learn more about the TexShare program by visiting library.sulross.edu/find-and-borrow/texshare/ or ask a librarian by emailing srsulibrary@sulross.edu.

Mike Fernandez, SRSU Librarian, is based in Eagle Pass (Building D-129) to offer specialized library services to

students, faculty, and staff. Utilize free services such as InterLibrary Loan (ILL), ScanIt, and Direct Mail to get materials delivered to you at home or via email.

**Distance Education Statement**: Students enrolled in distance education courses have equal access to the university's academic support services, such as Smarthinking, library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login information to verify students' identities and to protect students' information. The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web- based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website.

**Academic Integrity:**. Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. A scholar is expected to be punctual, prepared, and focused; meaningful and pertinent participation is appreciated. Examples of academic dishonesty include but are not limited to: Turning in work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden.

**Generative Artificial Intelligence (AI):** The University does not recommend or endorse any specific AI tools or resources. Students should be aware that many generative AI tools (e.g., ChatGPT, Google Gemini, Microsoft Copilot) store user input and may use this data to train future models. For this reason, students should never upload or share personal, confidential, or identifiable information—such as names, ID numbers, health data, or assignment submissions containing such details—into any generative AI platform. When using AI tools, students should verify whether the tool complies with student privacy standards as indicated by the University. Faculty may recommend specific tools that better align with institutional data privacy policies, but ultimate responsibility for data protection rests with users. Students are encouraged to use faculty-recommended platforms when engaging in coursework involving generative AI. The University is not liable for any adverse experience or impact when students interact with these tools.

**Student Responsibilities :** All full-time and part-time students are responsible for familiarizing themselves with the Student Handbook and the Undergraduate & Graduate Catalog and for abiding by the University rules and regulations. Additionally, students are responsible for checking their Sul Ross email as an official form of communication from the university. Every student is expected to obey all federal, state and local laws and is expected to familiarize themselves with the requirements of such laws.

**Classroom Climate of Respect:** Importantly, this class will foster free expression, critical investigation, and the open discussion of ideas. This means that all of us must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, we must all learn how to probe, oppose and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against another on the basis of race, religion, ethnicity, age, gender, national origin, or sexual preference. Still, we will not be silenced by the difficulty of fruitfully discussing politically sensitive issues.

**Supportive Statement:** I am to create a learning environment for my students that supports various perspectives and experiences. I understand that the recent pandemic, economic disparity, and health concerns, or even unexpected life events may impact the conditions necessary for you to succeed. My commitment is to be there for you and help you meet the learning objectives of this course. I do this to demonstrate my commitment to you and to the mission of Sul Ross State University to create a supportive environment and care for the whole student as part of the Sul Ross Familia. If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. I want to be a resource for you.

**Tutoring:** The Lobo Den Tutoring Center offers FREE tutoring support to help you excel in your courses. Whether you need assistance in Writing, Math, Science, or other subjects, we're here to help!

Important Information:

Drop-in and Scheduled Appointments: Flexible options to fit your needs. Hours of Operation: Monday–Friday, 8:00 AM – 5:00 PM. Workshops: Attend our regularly hosted academic workshops on STEM topics and professional development, often in collaboration with specialized faculty. Location: BWML Room 128. Contact Us: For more information or to book an appointment, email tutoring@sulross.edu or call (432) 837-8726. Looking for additional support?

Tutor.com offers FREE 24/7 online tutoring in over 200 subjects, including specialized support for ESL and ELL learners with native Spanish-speaking tutors. Access Tutor.com via Blackboard: Log in to your Blackboard account to get started anytime, anywhere. Take advantage of these valuable resources to boost your confidence and performance in your classes. We look forward to helping you succeed!

**Important Dates:**

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|---|---|
| May 27 | First Day of Classes |
| May 28 | Last Day for Late Registration and Schedule Changes |
| June 1 | Census Day (last day to drop a class without making an academic record) |
| June 18 | Last Day to Withdrawal from University or Drop Classes with a Grade of "W"" (by 4 pm) |
| July 1 | Final Exams |

Tentative Schedule-Subject to Change

| Week | Topics | Assignments |
|---|---|---|
| Week 1 | Intro Fundamental Concepts | Read Chapter 0 and 1 |
| Week 2 | Straightness,Straightness on Spheres | Read Chapter 2<br>Chapter 1 and 2 Homework due |
| Week 3 | Angles, Straightness on Cones | Read Chapters 3 and 4<br>Chapter 3 an 4 Homework Due<br>Quiz 1 |
| Week 4 | Hyperbolic Geometry, Triangles, Parallel Properties, | Read Chapters 5, 6, and 8<br>Chapter 5, 6, and 8 Homework Due<br>Computer Assignment 1 Due |
| Week 5 | Congruencies, Isometries | Read Chapter 9,10,11<br>Chapter 9,10,11 Homework Due<br>Quiz 2 Due |
| Week 6 | Circles, Equations, 3-Space, Final Exam (July 1) | Chapter 15,19,22 Homework Due<br>Computer Assignemnt 2 Due<br>Final Exam Due |