

Texas A&M University--San Antonio
at One University Way, San Antonio, TX 78224
Department of Computational, Engineering, and
Mathematical Sciences (CEMS)



Spring 2024
MATH 3360: *MODERN GEOMETRY*
Section: 001; MWF 10-10:50am, HALL207
Credit Hours: 3 credit

Instructor: Amy Main
Office: Hall 218
Phone: 210-784-2821
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Office hours: MWF 11-11:50am, WF 9:30-9:55am or other times
available by appointment. **Do not hesitate to make arrangements
to see me outside of office hours.**

COURSE DESCRIPTION & MATERIALS:

Catalog Description: An axiomatic approach to geometry to include contrasting traditional and modern approaches to geometry, an introduction to non-Euclidean geometry with historical perspectives, and applications. **Prerequisite:** Math 3325.

Required Textbook: M.J. Greenberg, *Euclidean and Non-Euclidean Geometries: Development and History* (1993), 3rd ed. Freeman, ISBN 0-7167-2446-4.

Calculator Policy: A scientific non-graphing, non-programmable calculator is required and allowed on all exams. Calculators will not be provided. Calculators may not be shared. **NOTE:** Laptops, cell phone, & other mobile devices are NOT acceptable calculators.

Student Learner Objectives: Students will gain understanding and knowledge of Euclidean and non-Euclidean geometry and their applications. Students who successfully complete the course will:

- Become familiar with the basic concepts of modern geometry and differences in approaches.
- Be able to explain the foundations of geometry to include the characteristics and properties of geometric entities.
- Become familiar with the basic concepts of non-Euclidean geometry.
- Develop a proficiency in reading, constructing and writing mathematical proofs in the context of an axiomatic approach to geometry.

In particular, students who successfully complete the course will demonstrate an understanding and working knowledge of:

- The basic concepts of modern geometry and differences in approaches.
- The foundations of geometry to include the characteristics and properties of geometric entities.
- The Axiomatic approach to geometry and proofs.
- Euclid's elements and influence of parallel postulate.
- Incidence Axioms and set theory with implications.
- Triangles and congruence criteria.
- Euclidean geometry to include trigonometry, coordinates and vectors.
- The basic concepts of non-Euclidean geometry to include other models of hyperbolic geometry.
- The basic concepts of spherical geometry.

The instructor reserves the right to modify/update the topics as appropriate.

COURSE WORK & GRADE DISTRIBUTION:

Class Attendance/Participation: Students are expected to regularly attend class and prepare for class by reading appropriate section(s) in the text and completing assignments before class. Students are also expected to participate in class discussions. Consistency and effort are the factors considered toward grade (e.g., in cases of one point difference between calculated grade and next letter grade).

Assignments: There will be regular homework assignments that are to be submitted as indicated by instructor or posted on Blackboard.

Papers: There will be 2 papers over each book, Flatland and Sphereland. More detailed guidelines will be provided later. The first paper will have an in-class peer review (rough draft) due on February 26th and the final draft due on March 6th. The second paper will have an in-class peer review (rough draft) due on April 15th and the final draft due on April 24th.

Examinations: There will be two exams during the semester and a final (comprehensive) exam.

Final Exam: In order to pass this class, students *must* take a comprehensive final exam scheduled during Finals Week. Finals cannot be rescheduled or missed (for dire & unforeseen medical or family emergencies, students must consult with me). The final exam may be used to replace your lowest regular exam grade. **The final exam must be completed by the announced due date. NO EXCEPTIONS.**

Course Objectives: That student should perform at a 70% or better average on exams, homework, class participation, & final covering the topics listed in the course description.

Grade:

Exam 1 (Feb 23)	- 100 pts	550 - 495 : A (90%)	I: Passing but for some justified reason you did not complete all required work (a test, final examination, etc.) You must complete the missing work for the course within 120 days, or the grade is automatically changed to a F.
Exam 2 (Apr 5)	- 100 pts	494 - 440 : B (80%)	
Final (TBD)	- 150 pts	439 - 385 : C (70%)	
Papers 2 @50pt each	- 100 pts	384 - 330 : D (60%)	
Homework	- 80 pts	below 390 : F	
Participation	- 20 pts	W: Student initiated drop	

Make-up Policy: There are no make-up for daily assignments, rather the lowest of these will be dropped. You are expected to always be present for major exams. Exams must be taken on the date specified. **No make-up exams will be given.** However, the lowest of the three regular exams may be replaced by the percentage final exam score. Extenuating circumstances that may force a student to miss a test should be discussed with the instructor immediately, if possible before the scheduled test date.

Late Work Policy: Acceptance of late homework is at the discretion of the instructor. Normally it will be graded if it is feasible to do so. Once a graded homework has been returned, late homework will not be accepted.

NOTE: There will NOT be an extra credit assignment, please DO NOT asks for it at the end of the semester. Start studying today! You have enough time to get the perfect grade. To be successful in this course, take responsibility for your learning & plan to study at least 2 hours for each class hour. Do not get behind; do not hesitate to ask for help. Make good use of the resources that are available to you, especially your book & your instructor. Save all your graded assignments, exams & homework until you receive your final grade.

COURSE POLICIES & EXPECTATIONS

Electronic Communication & Announcements: To contact me outside of the classroom, students should use their university issued email address. I will reply to questions & concerns within 48 hrs. Also students are expected to check Blackboard for important announcements & course materials.

Class Attendance: Attending class is **mandatory** & attendance will be taken daily. Absences of students are recorded without exception, from the official date of enrollment. Both tardiness and early departure from class may be considered forms of absenteeism. In all cases, students will be held responsible for completion of course requirements covered in their absence. Students are expected to attend class as scheduled and be prepared to participate in discussions, in-class exercises, quizzes and problem presentation. If you miss class,

you are responsible for finding out what you missed on that day. You are welcome to ask questions on the topics that you missed; however, it is your responsibility to learn the material. You are strongly encouraged to attend all classes. In addition, if an unavoidable situation prevents you from being on time or if you must leave early, please minimize class interruption.

Civility in the Classroom: Students are expected to be supportive & encouraging to other students to help create a positive learning environment. Thus I respectfully ask that you not use cell phones, laptops, or other electronic devices in class for any non-course related purposes. In particular, please do not send or read text messages or emails; please do not browse Facebook; please do not surf the web. Doing so is distracting to you, to me, & to your fellow students. Please make every effort to avoid situations that require you to leave before the end of class. However, in the event that you must leave class early please inform your instructor in advance.

Blackboard: Students are responsible for checking Blackboard regularly for announcements, assignments, & other support materials posted there. However, students are also responsible for all announcements & assignments which are given in the classroom. Please use my TAMUSA e-mail if you need to communicate with me about the lecture.

Dropping the Course: It is the student's responsibility to drop a course. The instructor may not automatically drop you. Please check the academic calendar webpage of TAMU-SA for the last day to drop a course or withdraw from the university. Please contact the Welcome Center at 784-1300 if you desire to drop the course.

Gradebook: The gradebook in Blackboard is updated after each exam. In addition to checking the grades in BB, you will receive a progress report after each exam to compare your grades with. Please keep your graded material until the end of the semester and inform your instructor of any discrepancies either in BB or on the progress report in a timely matter.

Electronic Devices: The use of phones or other electronic devices for non-class related activities is not allowed. Anyone who is observed text messaging or using an electronic device during class for a non-class related purpose will be given a warning, and as a further action that person will be asked to drop the class. Devices should be turned off and put away during exams & quizzes.

Communication etiquette: When using Jaguar email, please employ professional writing skills, Correspondence should begin with an appropriate salutation including the professor's academic title with last name and end with an appropriate closing with the student's full name. (Once a thread has been established, it may not be necessary to use a salutation or your full name each time.) The body of the correspondence should always demonstrate good spelling, grammar, punctuation, and general courtesy. Correspondence that does not adhere to these standards will receive an automatic reply of *Please see syllabus information on communication etiquette*. Email is monitored Monday-Friday during standard business hours. Please allow at least two business days for email replies.

IMPORTANT UNIVERSITY POLICIES & RESOURCES

University Email Policy and Course Communications: All correspondence between professors and students must occur via University email accounts. You must have your Jaguar email account ready and working. If it is not working, contact the help desk at helpdesk@tamusa.edu or at 210-784-HELP (4357). If you don't hear back within 48 hours, contact them again. They have many requests during the first part of the semester, so you may need to follow up with them.

Academic Accommodations for Persons with Disabilities: Texas A&M University-San Antonio is committed to providing all students with reasonable access to learning opportunities and accommodations in accordance with The Americans with Disabilities Act, as amended, and Section 504 of the Rehabilitation Act. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Support Services in the Central Academic

Building, Suite 210, or at (210) 784-1335 or visit <https://www.tamusa.edu/index.html> or email us at dss@tamusa.edu. Disabilities may include, but are not limited to, attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Support Services and their instructors as soon as possible.

Academic Learning Center: The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the *Tools* section of Blackboard. You can contact the Academic Learning Center by emailing tutoring@tamusa.edu, calling (210) 784-1307, or visiting the Central Academic Building, room 202.

Counseling/Mental Health Resources: As a college student, there may be times when personal stressors interfere with your academic performance and/or negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through the Student Counseling Center (SCC). To schedule an appointment call 210-784-1331 or visit Madla 120.

All mental health services provided by the SCC are free and confidential (as the law allows). The Student Counseling Center provides brief individual and group therapy, crisis intervention, consultation, case management, and prevention services.

Crisis support is available 24/7 by calling the SCC at 210-784-1331 (after-hours select option '2'). For more information and self-help resources, please visit www.tamusa.edu/studentcounseling

Emergency Preparedness: JagE Alert is Texas A&M University-San Antonio's mass notification. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email with instructions and updates. To register or update your information visit: <https://tamusa.bbcportal.com/>.

More information about Emergency Operations Plan and the Emergency Action Plan can be found here: <https://www.tamusa.edu/about-us/campus-information/safety/university-police-department/documents/emergency-operations-plan.pdf> and <https://www.tamusa.edu/about-us/campus-information/safety/university-police-department/documents/emergency-action-plan.pdf>

Download the SafeZone App for emergencies or call (210) 784-1911. Non-Emergency (210) 784-1900

Financial Aid and Verification of Attendance: According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended the first week of class. Any student receiving federal financial aid who does not attend the first week of class will have their aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

Writing, Language, and Digital Composing Center: The Writing, Language, and Digital Composing Center supports graduate and undergraduate students in all three colleges as well as faculty and staff. Tutors work with students to develop reading skills, prepare oral presentations, and plan, draft, and revise their written assignments. Our language tutors support students enrolled in Spanish courses and students composing in Spanish for any assignment. Our digital studio tutors support students working on digital projects such as eportfolios, class presentations, or other digital multimedia projects. Students can schedule appointments through JagWire under the Student Services tab. Click on "Writing, Language, and

Digital Composing Center” to make your appointment. The Center offers face-to-face, synchronous online, and asynchronous digital appointments. More information about what services we offer, how to make an appointment, and how to access your appointment can be found on our website at <https://bit.ly/WLDCCenter>.

Meeting Basic Needs: Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Dean of Students (DOS@tamusa.edu) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to provide any resources they may possess.

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to communicate, in advance if possible, and special circumstances (e.g., upcoming deployment, drill requirements, disability accommodations). You are also encouraged to visit the Patriots’ Casa in-person room 202, or to contact the Office of Military Affairs with any questions at military.va@tamusa.edu or (210)784-1397.

Religious Observances: Texas A&M University-San Antonio recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

The Six-Drop Rule: Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student’s GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as “F” grades and will impact the student’s GPA.

Statement of Harassment and Discrimination: Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equality of opportunity and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality and the uniqueness of the individual within our state, nation, and world. All decisions and actions involving students and employees should be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, gender identity, gender expression, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the appropriate offices within their respective units.

Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university as a whole. If you have experienced any form of sex- or gender-based discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking, know that help and support are available. A&M-San Antonio’s Title IX Coordinator can support those impacted by such conduct in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the Title IX Coordinator. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and trained victim advocates) are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the university’s Title IX Coordinator (titleix@tamusa.edu, 210-784-2061, CAB 439K). If you wish to speak to a confidential employee who does not have this reporting requirement, you can contact the Student Counseling Center at (210) 784-1331 or visit them in Madla 120.

Pregnant/Parenting Students: Texas A&M-San Antonio does not require a pregnant or parenting student, solely because of that status or issues related to that status, to (1) take a leave of absence or withdraw from their degree or certificate program; (2) limit the student’s studies; (3) participate in an alternative program; (4) change the student’s major, degree, or certificate program; or (5) refrain from joining or cease participating in any course, activity, or program at the University. The university will provide reasonable accommodations to pregnant

students that would be provided to a student with a temporary medical condition and that are related to the health and safety of the student and the student's unborn child. These could include maintaining a safe distance from substances, areas, and activities known to be hazardous to pregnant individuals and their unborn child; excused absences because of illness or medical appointments; modified due dates for assignments; rescheduled tests/exams; taking a leave of absence; and being provided access to instructional materials and video recordings of lectures for excused absences, if these would be provided to any other student with an excused absence. Pregnant/parenting students are encouraged to contact the Title IX Coordinator with any questions or concerns related to their status (titleix@tamusa.edu; 210-784-2061; CAB 439K).

Texas A&M-San Antonio has also designated the Title IX Coordinator as the liaison officer for current or incoming students who are the parent or guardian of a child younger than 18 years of age. The Title IX Coordinator can provide students with information regarding support services and other resources.

Students' Rights and Responsibilities: The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

Students' Rights

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no University rule or administrative rule that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the University, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university student rules shall be assured a fundamentally fair process.

Students' Responsibilities

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty and administration.
2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, [Student Code of Conduct](#), on our website, University Catalog and to comply with them, as well as federal, state, and local laws.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to recognize the University's obligation to provide an environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notification.

We expect that students 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.

Students are expected to exhibit a high level of honesty and integrity in their pursuit of higher education. Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or

disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in the course syllabus or class discussion may be considered as academic misconduct. For more information on academic misconduct policies and procedures please review the [Student Code of Conduct](#).

No Use of Generative AI Permitted: Math 1314 assumes that all work submitted by students will be generated by the students themselves, working individually or in groups. Students should not have another person/entity do the writing of any portion of an assignment for them, which includes hiring a person or a company to write assignments and/or using artificial intelligence (AI) tools like ChatGPT. Use of any AI-generated content in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

Electronic Devices: The use of phones or other electronic devices for non-class related activities is not allowed. Anyone who is observed text messaging or using an electronic device during class for a non-class related purpose will be given a warning, and as a further action that person will be asked to drop the class. Devices should be turned off and put away during exams and quizzes.

Important Dates:

January 16	First day of class
March 11-17	Spring Break – No classes
March 29	Study Day – No classes
April 13	Last day to drop with an automatic “W”
April 20	Last day to drop a course or withdraw from the University
April 29	Last day of classes
April 30	Study Day – No classes
May 1-7	Final exams

The complete academic calendar is available online: <https://www.tamusa.edu/academics/academic-calendar/index.html>