

MATH 5341: Concepts and Techniques in Geometry
Spring 2016

Instructor(s): Dr. Kathryn Rhoads

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Office Hours: Monday 4:30 – 5:20, or by appointment

Section Information: MATH 5341-001

Time and Place of Class Meetings: Mondays, 5:30 – 8:20pm, PKH 309

Description of Course Content: This course will explore Euclidean and Non-Euclidean geometry, with connections to history. Geometric concepts will be introduced and explored through problems, and students will be expected to approach these with intuition, personal experiences, and reasoning. Activities will emphasize collaborative learning, classroom discourse, and written justifications and proofs. This course will also make connections to geometry instruction in secondary school.

Student Learning Outcomes: Upon successful completion of this course, you will be able to:

- ☐ Apply problem-solving skills to problem situations in geometry.
- ☐ Describe historical origins of geometry.
- ☐ Describe connections among Euclidean geometry and other non-Euclidean geometries.
- ☐ Explain geometric concepts using clear mathematical arguments and proofs.
- ☐ Examine your beliefs of what geometry (more generally, mathematics) is about.
- ☐ Reflect on the teaching and learning of geometry in secondary school.

Required Textbooks and Other Course Materials:

Text:

Experiencing Geometry: Euclidean and Non-Euclidean with History Third Edition (2005)
by David W. Henderson & Daina Tamina
Pearson Education, Inc.
ISBN: 0131437488

Other Materials:

Additional readings will be provided through UTA Blackboard (elearn.uta.edu).

Blackboard will also be used for course communication and assignments. For assistance with Blackboard, please contact the UTA Helpdesk at the Office of Information Technology.

Inexpensive household objects will be requested throughout the semester as the need arises, including rubber bands and a tennis ball or plastic sphere.

Course Assignments and Examinations:

Writing Assignments:

You will be asked to write your solutions to several of the problems discussed in class. Seven writing assignments (WAs) will be given. During class time, you will work in groups to solve problems, but the WA you submit should be your own work. You will be allowed three drafts of each WA, and the submission/ revision process will be as follows:

1. Submit Draft 1 of your WA.
2. A peer will make comments on Draft 1 (three times this semester)
OR Instructor will make comments on Draft 1.
3. Submit Draft 2 of your WA.
4. Instructor will make comments on your Draft 2.
5. Submit Final Copy of your WA.

The goal of the WAs is to develop skills for writing proofs through an ongoing dialogue among students and instructor. As such, you will be asked to critique the reasoning and arguments of your peers as well as respond to comments and questions on your own writing. A grading rubric will be provided.

WAs may be hand-written, typed, or a combination (such as typed with hand-drawn figures). Hand-written portions must be neat and readable. Submission through Blackboard is highly encouraged, but paper copies will also be accepted. After you receive comments for each draft, you may submit responses to questions and comments in a separate paper, or you may rewrite the original assignment. All drafts and peer comments are due on class days at 5:30pm. You will need a paper copy of your completed peer comments to discuss with your partner. You may bring a copy, or the instructor will print copies if you submit your comments to Blackboard **by 4:00pm** on the due date. No comments will be made on late drafts, and your grade will be lowered for late or missing critiques on peer work.

Technology (e.g., Geometer's Sketchpad, Geogebra) will sometimes be used to supplement written work. Further instructions will be provided for submitting technology assignments. With advance notice, your group may be asked to give short presentations and lead discussions on your solutions to problems discussed during class.

Quizzes:

You will have five short quizzes to assess readings and content covered in the course. Quiz dates are on the course schedule. These quizzes will be at the beginning of class, and you may use your textbook, readings, and all notes during 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.

Final Exam:

The final exam is cumulative.

Other Course Expectations:

Attendance: At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I have established the following attendance policy:

Because this course relies heavily on group participation and meets only once per week, attendance is mandatory. You may miss one class period (3 hours) for any reason without penalty. Your final course grade will be lowered one-half letter grade (5%) for any additional absences (including arriving significantly late).

Professionalism: You are expected to actively participate in and stay on task during classroom activities and discussions. You are encouraged to offer suggestions and conjectures even if you aren't sure of the answers. In addition, you are expected to work with others, respect others' ideas, and celebrate others' successes. Students with lack of or inappropriate participation will be required to meet with the instructor to develop an action plan.

Grading:

Writing Assignments	70%
Quizzes	15%
<u>Final Exam</u>	<u>15%</u>
Total	100%

Course Schedule

Topics	Date	Assignments Due							
		Quiz	WA #1	WA #2	WA #3	WA #4	WA #5	WA #6	WA #7
Historical Strands of Geometry	Jan 25								
What is "straight"?	Feb 1	Q1							
Straightness on spheres	Feb 8		D1						
	Feb 15		PR	D1					
What is an angle?	Feb 22		D2		D1				
	Feb 29	Q2		D2		D1			
Straightness on cylinders and cones	Mar 7		FC		D2		D1		
	Mar 14	NO CLASS: Spring Break							
	Mar 21			FC		D2	PR		
Straightness on hyperbolic planes	Mar 28				FC		D2	D1	
	Apr 4	Q3				FC			D1
Triangles and Congruencies	Apr 11						FC	D2	PR
	Apr 18	Q4							D2
Area and Holonomy	Apr 25							FC	
	May 2	Q5							FC
ALL	May 9	FINAL EXAM							

KEY: Q#: Quiz number; D#: Draft number; PR: Peer review; FC: Final copy

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Kathryn E. Rhoads

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the **Office for Students with Disabilities (OSD)**. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364.
Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671.

Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Title IX: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos. For information regarding Title IX, visit www.uta.edu/titleIX.*

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located immediately to the left as you exit this room. When exiting the building during an emergency, one should never take an

elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Student Support Services: Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at <http://www.uta.edu/universitycollege/resources/index.php>

<p>Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911. Non-emergency number 817-272-3381</p>
