MTHK 4302.110 College Geometry I Spring 2018

Instructor & Contact Information

Mienie Roberts, PhD
Associate Professor in Mathematics
College of Arts and Sciences
1001 Leadership Place, Killeen TX 76549

Office: Warrior Hall 420M
Office Hours: Face-to-face: Monday 1:00pm-2:00pm, 4:45pm-6:00pm
Tuesday 12:00pm-2:00pm

Online: Monday 1:00pm-2:00pm, 4:45pm-6:00pm
Tuesday 12:00pm-2:00pm
Or by appointment
We will use web conferencing software for online office hours.
Mathematics graduate student has face-to-face office hours on Tuesdays and Thursdays from 2:00pm-4:00pm in Warrior Hall 420N.
Class meeting times: Online on Mondays from 5pm-6pm.
Work email: dekock@tamuct.edu
Cell Phone: 903-705-9703 Feel free to call or text me during my office hours (or any other time) if you have questions.

Texas A&M University-Central Texas Mission Statement

Texas A&M University-Central Texas is an upper-level university offering junior and senior-level coursework needed to successfully complete baccalaureate degrees and all coursework leading to the completion of graduate degrees. The University is committed to high quality, rigorous, and innovative learning experiences, and prepares students for lifelong learning through excellence in teaching, service, and scholarship.

Mode of Instruction & Course Access

This course is an online course and uses TAMUCT canvas Learn system
https://tamuct.instructure.com/
and the GeoGebra software
https://www.geogebra.org/
All course materials will be posted at:
http://rpubs.com/mroberts/350014
Make sure to check this website daily, since there will be regular updates performed to the page.

The student will use the Canvas username and password communicated to you separately to login to this system.

No other course materials will be required for this class.

Student-Instructor Interaction

I will respond to emails and text messages within 24 hours.

UNILERT - Emergency Warning System for Texas A&M University–Central Texas

UNILERT is an emergency notification service that gives Texas A&M University-Central Texas the ability to communicate health and safety emergency information quickly via email, text message, and social media. All students are automatically enrolled in UNILERT through their myCT email account. Connect at www.TAMUCT.edu/UNILERT to change where you receive your alerts or to opt out. By staying enrolled in UNILERT, university officials can quickly pass on safety-related information, regardless of your location.

Course Information

Program Goal

Texas A&M University-Central Texas students, upon completion of certification requirements, will be reflective professional educators who make effective educational decisions that support the creation of dynamic learning environments.

Course Overview and Description: MTHK 4302.110

Math 4302 (College Geometry) is designed to prepare students for the Geometry and Measurement domain on the TExES Math 7-12 exam. The class aims to equip students with the requisite knowledge and skills that an entry-level educator in this field in Texas public schools must possess. The class also incorporates GeoGebra as a tool for understanding and teaching geometric concepts.

Course Objective

Math 4302 prepares aspiring secondary mathematics teachers for the "Geometry and measurement" domain on the 4-8 and 7-12 state certification examinations. Topics covered are in accordance with the standards and competencies covered in the TExES examinations. Students will learn both content and methods of teaching geometry with technology (including GeoGebra).

Student learning outcomes as per the Core Subjects 7-12 Mathematics Math Standards

Domain III — Geometry and Measurement

Competency 011: *The teacher understands measurement as a process.*

The beginning teacher:

A. Applies dimensional analysis to derive units and formulas in a variety of situations (e.g., rates of change of one variable with respect to another) and to find and evaluate solutions to problems.
B. Applies formulas for perimeter, area, surface area and volume of geometric figures and shapes (e.g., polygons, pyramids, prisms, cylinders, cones, spheres) to solve problems.
C. Recognizes the effects on length, area or volume when the linear dimensions of plane figures or solids are changed.
D. Applies the Pythagorean theorem, proportional reasoning and right triangle trigonometry to solve measurement problems.
E. Relates the concept of area under a curve to the limit of a Riemann sum.
F. Uses integral calculus to compute various measurements associated with curves and regions (e.g., area, arc length) in the plane, and measurements associated with curves, surfaces and regions in three-space.

Competency 012: *The teacher understands geometries, in particular Euclidian geometry, as axiomatic systems.*

The beginning teacher:

A. Understands axiomatic systems and their components (e.g., undefined terms, defined terms, theorems, examples, counterexamples).
B. Uses properties of points, lines, planes, angles, lengths and distances to solve problems.
C. Applies the properties of parallel and perpendicular lines to solve problems.
D. Uses properties of congruence and similarity to explore geometric relationships, justify conjectures and prove theorems.

E. Describes and justifies geometric constructions made using compass and straightedge, reflection devices and other appropriate technologies.

F. Demonstrates an understanding of the use of appropriate software to explore attributes of geometric figures and to make and evaluate conjectures about geometric relationships.

G. Compares and contrasts the axioms of Euclidean geometry with those of non-Euclidean geometry (i.e., hyperbolic and elliptic geometry).

Competency 013: *The teacher understands the results, uses and applications of Euclidian geometry.*

The beginning teacher:

A. Analyzes the properties of polygons and their components.

B. Analyzes the properties of circles and the lines that intersect them.

C. Uses geometric patterns and properties (e.g., similarity, congruence) to make generalizations about two- and three-dimensional figures and shapes (e.g., relationships of sides, angles).

D. Computes the perimeter, area and volume of figures and shapes created by subdividing and combining other figures and shapes (e.g., arc length, area of sectors).

E. Analyzes cross-sections and nets of three-dimensional shapes.

F. Uses top, front, side and corner views of three-dimensional shapes to create complete representations and solve problems.

G. Applies properties of two- and three-dimensional shapes to solve problems across the curriculum and in everyday life.

Competency 014: *The teacher understands coordinate, transformational and vector geometry and their connections.*

The beginning teacher:

A. Identifies transformations (i.e., reflections, translations, glide-reflections, rotations, dilations) and explores their properties.

B. Uses the properties of transformations and their compositions to solve problems.

C. Uses transformations to explore and describe reflectional, rotational and translational symmetry.

D. Applies transformations in the coordinate plane.

E. Applies concepts and properties of slope, midpoint, parallelism, perpendicularity and distance to explore properties of geometric figures and

solve problems in the coordinate plane.

F. Uses coordinate geometry to derive and explore the equations, properties and applications of conic sections (i.e., lines, circles, hyperbolas, ellipses, parabolas).

G. Relates geometry and algebra by representing transformations as matrices and uses this relationship to solve problems.

H. Explores the relationship between geometric and algebraic representations of vectors and uses this relationship to solve problems.

Competency 009: *The teacher understands trigonometric and circular functions, analyzes their algebraic and graphical properties and uses them to model and solve problems.*

The beginning teacher:

A. Analyzes the relationships among the unit circle in the coordinate plane, circular functions and the trigonometric functions.

B. Recognizes and translates among various representations (e.g., written, numerical, tabular, graphical, algebraic) of trigonometric functions and their inverses.

C. Recognizes and uses connections among significant properties (e.g., zeros, axes of symmetry, local extrema) and characteristics (e.g., amplitude, frequency, phase shift) of a trigonometric function, the graph of the function and the function's symbolic representation.

D. Understands the relationships between trigonometric functions and their inverses and uses these relationships to solve problems.

E. Uses trigonometric identities to simplify expressions and solve equations.

F. Models and solves a variety of problems (e.g., analyzing periodic phenomena) using trigonometric functions.

G. Uses graphing calculators to analyze and solve problems involving trigonometric functions.

Required Reading and Textbook(s)

The student is not required to purchase a textbook. All required materials can be found at:
http://rpubs.com/mroberts/350014

Course Requirements

Student Learning and Assessment

Final Exam	The Final is a proctored exam and is comprehensive.
Activities	Student will be required to complete 10 Activities. Student needs to illustrate competency in teaching abstract geometric concepts with manipulatives. Please record the activity and upload to youtube or any cloud server and email link to: dekock@tamuct.edu
Online discussions	10 online discussions available on Canvas.
Presentations	The student will be required to use R for statistical analyses and present the findings by creating a video that will be emailed to: dekock@tamuct.edu
Midterm	The midterm is a proctored exam.
Projects	Students will be required to complete 10 projects in GeoGebra. Please record screen and answer questions with the GeoGebra software and upload recording to youtube or other cloud server and email link to: dekock@tamuct.edu

Testing Center
The Office of Academic Support Programs (ASP) provides proctoring, or supervised testing, services for students enrolled in TAMUCT online classes. It is also a part of the Tarleton State and Central Texas College testing networks, serves as a general testing center for Killeen, and is the university resource for verifying and coordinating with proctors at other testing locations.

Testing at TAMUCT is provided free of charge for active TAMUCT students. For non-TAMUCT students, there is a $15 administration fee, which can be paid on the day of the exam. The student is solely responsible for all testing fees.

All testing requests need to be submitted at least 5 business days before the day of the exam. If submitted in less than 5 business days, Academic Support Programs cannot guarantee the administration of that exam.

To take a proctored exam at TAMUCT:

Submit the TAMUCT Testing Form online. **https://www.tamuct.edu/departments/academicsupport/proctoring.php**

ASP will confirm your requested test time or suggest a new one within two business days.
Plan to arrive at the testing location at least fifteen minutes before the scheduled time. Remember to bring a photo ID, a pencil or pen, and any other supplies that are allowed by your instructor. The proctor is not responsible for providing materials for your test other than scratch paper.
For questions, or if you need testing accommodations, please contact Cecilia Morales in room WH 212C or by:
Phone: 254.501.5830
Fax: 254.501.5807
Email: **cecilia.morales@tamuct.edu**

Testing Center Hours
Spring available times for proctoring: (see exceptions below)

Closed Daily: 1:00pm - 2:00pm
The testing center is located in **Warriors Hall 212.**

Evaluation & Assessment (Grading Criteria)

1.	Activities (10x25)……	25% (250 points)
2.	Final (1x200)……	20% (200 points)
3.	Midterm (1x200)……	20% (200 points)
4.	Projects (10x25)……	25% (250 points)
5.	Online discussions (10x10)	10% (100 points)
Total		100% (1000 points)

Evaluation Summary:

Grades will be assigned at the end of the semester on the following point basis:
A = 90-100
B = 80-89
C = 70-79
D = 60-69
F =59 and below

Posting of Grades

Grades will be updated regularly and posted to CANVAS under "Gradebook" after completion of course assignments.

Course Outline & Calendar

MTHK 4302 The instructor reserves the right to modify the calendar for the benefit of the students.

Week 1	Jan 15 Martin L. King Jr. Day No class	Jan 16	Jan 17	Jan 18
Week 2	Jan 22 1. Axiomatic sytems 2. Properties of points, lines, angles, planes 3. Triangles	Jan 23	Jan 24	Jan 25 Online discussion 1 due Activity 1 due Project 1 due
Week 3	Jan 29 1. Circles 2. Pi	Jan 30	Jan 31	Feb 1 Online discussion 2 due Activity 2 due Project 2 due
Week 4	Feb 5 1. Polygons 2. Perimeter and Area 3. Geoboards	Feb 6	Feb 7	Feb 8 Online discussion 3 due Activity 3 due Project 3 due
Week 5	Feb 12 1. Congruence 2. Similarity	Feb 13	Feb 14	Feb 15 Online discussion 4 due Activity 4 due Project 4 due
Week 6	Feb 19 1. Geometric constructions	Feb 20	Feb 21	Feb 22 Online discussion 5 due Activity 5 due Project 5 due
Week 7	Feb 26 Review for the midterm	Feb 27	Feb 28	March 1
Week 8	March 5 Midterm	March 6	March 7	March 8
Spring Break	March 12 No class	March 13	March 14	March 15
Week 9	March 19 1. Three-dimensional figures	March 20	March 21	March 22 Online discussion 6 due Activity 6 due Project 6 due
Week 10	March 26	March	March 28	March 29

	1. Volume, cross-sections and nets	27		Online discussion 7 due Activity 7 due Project 7 due
Week 11	April 2 Pythagorean theorem	April 3	April 4	April 5 Online discussion 8 due Activity 8 due Project 8due
Week 12	April 9 Transformations	April 10	April 11	April 12 Online discussion 9 due Activity 9 due Project 9 due
Week 13	April 16 1. Slope, distance, coordinate plane	April 17	April 18	April 19 Online discussion 10 due
Week 14	April 23 1. Relate Geometry and Algebra	April 24	April 25	April 26 Activity 10 due Project 10 due
Week 15	April 30 Review for the final exam	May 1	May 2	May 3
Week 16	May 7 Final exam	May 8	May 9	May 10

University Procedures & Policies

TAMUCT Department of Curriculum & Instruction Professional Expectations

Texas A&M University-Central Texas clinical teachers are guests in the schools in which they are placed. Each clinical teacher must abide by all regulations and policies established by the district, central administration, campus administrators, and cooperating teachers.

Candidates for teacher certification at TAMUCT will demonstrate the following qualities and behaviors in pursuit if their goal of becoming a professional educator.

Quality	Behavior
Communication	communicate appropriately and effectively with colleagues, supervisors, students, parents, caregivers and community members using various forms
Collaboration	work collaboratively with colleagues, mentors and supervisors to achieve the local, state, and national goals of education
Commitment	demonstrate commitment to the teaching profession and exercise leadership for the advancement of the profession and public education; be responsible, punctual, regular in attendance, and prepared to participate in all aspects of professional development
Professional Development	Take responsibility for utilizing professional teaching practices and constantly strive to improve through professional growth
Ethical Conduct	Uphold the Code of Ethics for Texas Educators and abide by local, state, federal rules, regulations, and policies; demonstrate respect and maintain ethical conduct in relations with professional colleagues, students, parents and members of the community

Attendance Policy

Professional behavior and commitment to teaching are expectations. Attendance and punctuality are required. Not only is your attendance required it is expected that you will come to class prepared to engage in your learning process. Being prepared to participate includes completing assigned reading and bringing necessary assignments and materials to class. It is NOT possible to make up the work missed during the class period since it involves the interactions of students, professor, and content. I will not provide "make-up" work. You may access this work through collaboration with a peer.

You are responsible for asking a classmate to take notes, and gather handouts for missed classes. It is your responsibility to find out what you

missed. Being prepared to participate includes completing assigned reading and bringing necessary assignments and materials to class.

Academic Integrity

Texas A&M University-Central Texas values the integrity of the academic enterprise and strives for the highest standards of academic conduct. A&M-Central Texas expects its students, faculty, and staff to support the adherence to high standards of personal and scholarly conduct to preserve the honor and integrity of the creative community. Academic integrity is defined as a commitment to honesty, trust, fairness, respect, and responsibility. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing grade for the course. Academic misconduct is any act that improperly affects a true and honest evaluation of a student's academic performance and includes, but is not limited to, cheating on an examination or other academic work, plagiarism and improper citation of sources, using another student's work, collusion, and the abuse of resource materials. All academic misconduct concerns will be reported to the university's Office of Student Conduct. Ignorance of the university's standards and expectations is never an excuse to act with a lack of integrity. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action. Honesty and integrity are essential characteristics for teachers. Students are required to act honestly and professionally at all times.

Any Violation of the Academic Integrity Policy will result in failure of the class (student will receive an "F").

Disability Support and Access Services

At Texas A&M University–Central Texas, we value an inclusive learning environment where every student has an equal chance to succeed and has the right to an education that is barrier-free. The Office of Disability Support and Access is responsible for ensuring that students with a disability enjoy equal access to the University's programs, services and activities. Some aspects of this course or the way the course is taught may present barriers to learning due to a disability. If you feel this is the case, please contact Disability Support and Access at (254) 501-5831 in Warrior Hall, Ste. 212. For more information, please visit their website at www.tamuct/disabilitysupport. Any information you provide is private and confidential and will be treated as such.

Drop Policy

If you discover that you need to drop this class, you must go to the Records Office and ask for the necessary paperwork. Professors **cannot** drop students; this is always the responsibility of the student. The record's office will provide a deadline for which the form must be returned, completed and signed. Once you return the signed form to the records office and wait 24 hours, you must go into Warrior Web and confirm that you are no longer enrolled. Should you still be enrolled, FOLLOW-UP with the records office immediately? You are to attend class until the procedure is complete to avoid penalty for absence. Should you miss the deadline or fail to follow the procedure, you will receive an F in the course.

Tutoring

Tutoring is available to all TAMUCT students, both on-campus and online. Subjects tutored include Accounting, Finance, Statistics, Mathematics, and Writing (APA). Tutors are available at the Tutoring Center in Warrior Hall, Suite 111. Visit www.tamuct.edu/AcademicSupport and click "Tutoring Support" for tutor schedules and contact information. If you have questions, need to schedule a tutoring session, or if you are interested in becoming a tutor, contact Academic Support Programs at 254-501-5836 or by emailing c.garza@tamuct.edu.

Chat live with a tutor 24/7 for almost any subject on your computer! Tutor.com is an online tutoring platform that enables TAMUCT students to log-in and receive FREE online tutoring and writing support. This tool provides tutoring in Mathematics, Writing, Career Writing, Chemistry, Physics, Biology, Spanish, Calculus, and Statistics. To access Tutor.com, click on http://www.tamuct.edu/departments/academicsupport/tutoring.php.

University Library

The University Library provides many services in support of research across campus and at a distance. We offer over 200 electronic databases containing approximately 250,000 eBooks and 82,000 journals, in addition to the 72,000 items in our print collection, which can be mailed to students who live more than 50 miles from campus. Research guides for each subject taught at TAMUCT are available through our website to help students navigate these resources. On-campus, the library offers technology including cameras, laptops, microphones, webcams, and digital sound recorders.

Research assistance from a librarian is also available twenty-four hours a day through our online chat service, and at the reference desk when the library is open. Research sessions can be scheduled for more comprehensive assistance, and may take place on Skype or in-person at the library. Assistance may cover many topics, including how to find articles in peer-reviewed journals, how to cite resources, and how to piece together research for written assignments.

Our 27,000-square-foot facility on the TAMUCT main campus includes student lounges, private study rooms, group work spaces, computer labs, family areas suitable for all ages, and many other features. Services such as interlibrary loan, TexShare, binding, and laminating are available. The library frequently offers workshops, tours, readings, and other events. For more information, please visit our homepage: http://www.tamuct.edu/departments/library/index.php.

The University Writing Center

The University Writing Center at Texas A&M University-Central Texas is a free workspace open to all TAMUCT students. The UWC is located in 416 Warrior Hall. The center is open 1pm-6pm Monday-Thursday during the summer semester. Students may work independently in the UWC by checking out a laptop that runs the Microsoft Office suite and connects to WIFI, or by consulting our resources on writing, including all of the relevant style guides. Students may also arrange a one-on-one session with a trained and experienced writing tutor. Tutorials can be arranged by visiting the UWC. Tutors are prepared to help writers of all levels and abilities at any stage of the writing process. Sessions typically last between 20-30 minutes.

While tutors will not write, edit, or grade papers, they will help students develop more effective invention and revision strategies.

Technology Requirements & Support

Technology Requirements

This course will use the Canvas learning management system.
GeoGebra software.

Technology Support

For technology issues, students should contact Help Desk Central. 24 hours a day, 7 days a week:

Email: helpdesk@tamu.edu Phone: (254) 519-5466 Web Chat: http://hdc.tamu.edu

When calling for support please let your support technician know you are a TAMUCT student.
For issues related to course content and requirements, contact your instructor.

Technology issues are not an excuse for missing a course requirement – make sure your computer is configured correctly and address issues well in advance of deadlines.

Your Professor…

What You Can Expect From Me

It is a great privilege to have the opportunity to work with you during this most exciting time of your educational career. I want to ensure your experience is as successful as possible. It is my hope that when the time comes for you to have your own classroom, you will have the skills necessary to make a lasting impact in the lives of your students. As such, I am available to you at all times during this semester. This course has been designed to offer you support in many areas of successful teaching, including the most problematic areas beginning teachers face.

I will:

- Be a resource to you if you need guidance at any time during educational experience.
- Provide feedback in a timely manner.
- Return e-mails and phone calls usually within 48 hours.
- Take writing, grammar, and spelling into consideration on all assignments.
- Treat each of you with the respect afforded a professional.