MA 241-001
Geometry for Middle School Teachers
University of Kentucky
Department of Mathematics
Fall 2023
CB 307
TR 5:00 p.m. - 6:15 p.m.

Contact Information:
Instructor: Ryan J. Rogers
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Office Hours:
T 2:30 p.m. - 4:30 p.m. (POT 722)
R 3:30 p.m. - 4:30 p.m. (POT 722)
Additional office hours are available by appointment.

Course Site:
This course will be published on the University of Kentucky Canvas site.

Course Description:
A course in plane and solid geometry designed to give middle school mathematics teachers the knowledge needed to teach a beginning geometry course. Cannot be counted toward the mathematics minor or major.

Prerequisite:
One semester of calculus or MA 201 with a grade of C or better.

University of Kentucky Professional Themes in Mathematics:
This course will address the four themes of the conceptual framework for the University of Kentucky professional education program: research, reflection, learning, and leading. Students will engage with fundamental ideas in mathematical research, reflecting on and analyzing core mathematical content that arises throughout mathematics at all levels. Students will develop as lifelong mathematical learners who will be able to take active leadership roles in their future roles as professionals and citizens. The ultimate goal in addressing these four themes is to produce teacher leaders who work together to improve student learning among diverse populations and improve education in Kentucky and beyond.

Unbridled Learning Initiatives and Kentucky Academic Standards:
This course will provide students an opportunity to advance their knowledge and mastery of the "tools" associated with Kentucky education reform, focusing on the content and practice standards outlined in the Kentucky Core Academic Standards. As students carry out projects and complete assignments that involve mathematical content underlying instructional activities for P-12 students in Kentucky schools, they will address one or more components of the Unbridled Learning initiatives.

Learning Objectives and Corresponding Assessments:
In this course, students will:

- Classify two- and three-dimensional shapes by geometric properties;

- Justify similarity and congruence of two shapes;

- Formally define transformations (i.e. translations, rotations, dilations, and reflections) on a coordinate plane;

- Apply properties of angles and algebra to solve for unknown values;

- Explore and understand the relationship between radius, diameter, circumference, and area of a circle;

- Derive the areas and volumes of triangles, quadrilaterals, polygons, and irregular shapes;

- Develop and implement multiple strategies, tactics, and tools to solve problems;

- Identify patterns and generalize to abstract reasoning;

- Develop techniques to persist;

- Effectively communicate understanding and ideas through written and oral responses;

- Challenge and critique reasoning;

- Rigorously evaluate conclusions, ideas, and progress;

- Evaluate lessons and activities to promote creative thinking, curiosity, and a growth mindset.

This will be evidenced by:

- Participation in activities;

- Completion of homework exercises and quizzes;

- Completion of written exams.

Required Materials:

1. *Connected Mathematics 3 Student Edition Grade 7: Shapes and Designs: Two-Dimensional Geometry*, copyright 2014, Prentice Hall, paperback. ISBN-13: 9780133276411. ISBN-10: 0133274470

2. *Connected Mathematics 3 Student Edition Grade 6: Covering and Surrounding: Two-Dimensional Measurement*, copyright 2014, Prentice Hall, paperback ISBN-13: 9780133274417. ISBN-10: 0133274411

3. *Connected Mathematics 3 Student Edition Grade 7: Stretching and Shrinking: Understanding Similarity*, copyright 2014, Prentice Hall, paperback, ISBN-13: 9780133274486. ISBN-10: 0133274489

4. *Connected Mathematics 3 Student Edition Grade 7: Filling and Wrapping: Three-Dimensional Measurement*, copyright 2014, Prentice Hall, paperback. ISBN-13: 9780133276411. ISBN-10: 0133276414.

5. *Connected Mathematics 3 Student Edition Grade 8: Looking for Pythagoras: The Pythagorean Theorem*, copyright 2014, Prentice Hall, paperback. ISBN-13: 9780133274516. ISBN-10: 0133274519.

6. *Connected Mathematics 3 Student Edition Grade 8: Butterflies, Pinwheels, and Wallpaper: Symmetry and Transformations*, copyright 2014, Prentice Hall, paperback, ISBN-13: 9780133276435. ISBN-10: 0133276430.

A ruler, a protractor, and a compass will also be beneficial.

Classroom Etiquette:
You are expected to be respectful to yourself, fellow students, and the instructor. Subsequently, there is a strict policy regarding electronics in this course. With the exception of an acceptable calculator, if you wish to use an electronic device for class purposes, you must attain the instructor's permission before using said device. Cell phones should not be used for any reason during class time. You should turn your cell phone off or place it on silent prior to the start of class. If there is a situation which requires you to use your cell phone or other electronic device during class time, please quietly step out of the classroom to do so.

Attendance and Participation:
Attendance is expected. For each unexcused absence beyond the first two, the portion of your final grade pertaining to attendance and participation will be reduced by 10 percentage points.

The design of this course calls for students to be actively involved in their learning. You will actively

support each other as you gain experience and understanding. Multiple ideas and perspectives are valued. You will benefit from exposure to others' approaches to analysis and problem solving, and others will benefit from your ideas. Therefore, active participation is expected.

A student will be deemed absent if they are more than 10 minutes late to class or leave before class is dismissed without a valid excuse. Students are responsible for the material we cover each day, regardless of their attendance.

If you miss a class for any reason, please communicate this to me as soon as possible - an e-mail will suffice. You will receive an opportunity to make up graded work missed due to an excused absence. Please refer to §5.2.4.2 of the Student Code of Conduct to see what constitutes an excused absence.

Suggested Homework and Quizzes:
Suggested homework exercises will be assigned frequently. Homework will be neither collected nor graded. However, almost every Thursday, there will be a quiz composed of questions based directly on the suggested homework. Students who complete the relevant exercises prior to a quiz will be allowed to refer to their solutions to said exercises while taking the quiz. Time in class will be allotted to discuss the exercises prior to each quiz.

Exams 1 and 2:
There will be two exams during the semester. The dates of these exams will be announced in class and via Canvas.

Final Exam:
The final exam will take place Tuesday, December 12, from 3:30 p.m. to 5:30 p.m. in CB 345.

Grading:
Your final course grade will be calculated according to the weighted scale that follows.

Attendance and Participation: 5%
Quizzes: 20%
Exam 1: 25%
Exam 2: 25%
Final Exam: 25%
(Total: 100%)

Your calculated grade will then be rounded to the nearest percent and determined according to the scale that follows.

A: 90% - 100%
B: 80% - 89%
C: 70% - 79%
D: 60% - 69%
E: 0% - 59%

Academic Policy Statements:
All students must adhere to the academic policy statements of the University Senate
(https://www.uky.edu/universitysenate/acadpolicy).

Academic Accommodations:
If you have a documented disability that requires academic accommodations, please notify me as soon as possible. To receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center for coordination of campus disability services available to students with disabilities.

Academic Offenses:
Cheating, plagiarism, and falsification or misuse of academic records will not be tolerated, and the University Senate rules on these matters (https://www.uky.edu/universitysenate/ao) must be followed. In addition, the use of generative artificial intelligence to complete assignments in this course is prohibited.

Recording in the Classroom:
Video and audio recordings are not permitted during class unless the student has received prior permission from the instructor. If permission is granted, recording of other students is prohibited. Any distribution of recordings is also prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor. All content for this course, including handouts, assignments, and lectures, are the intellectual property of the instructor and cannot be reproduced, sold, or used for any purpose other than educational work in this class without prior permission from the instructor.

Diversity, Equity, and Inclusion:
The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community (Governing Regulations XIV). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the University community (https://www.uky.edu/regs/gr14). These identities include, but are not limited to, those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.

We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the Office of Institutional Equity and Equal Opportunity. Students may also contact a faculty member within the department, the program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of these individuals are mandatory reporters under University policies.

Nondiscrimination Policy:
The University of Kentucky faculty are committed to supporting students and upholding the University's nondiscrimination policy. Discrimination is prohibited at the University of Kentucky. If you experience an incident of discrimination, you are encouraged to report it to the Office of Institutional Equity and Equal Opportunity.

Acts of Sex- or Gender-Based Discrimination or Interpersonal Violence:
If you experience an incident of sex- or gender-based discrimination or interpersonal violence, you are encouraged to report it. While you may speak with a faculty member or graduate teaching or research assistant, please understand that, as "Responsible Employees" of the University, these individuals are required to report any act of violence, including verbal bullying or sexual harassment, to the University's Title IX coordinator in the Office of Institutional Equity and Equal Opportunity. If you would like to speak with someone who may be able to afford you confidentiality, you may consult the Counseling Center, University Health Service, or the Violence Intervention and Prevention Center.

The instructor reserves the right to alter this syllabus at any time. Students will be properly notified of any changes.