## MATH 206: Mathematics for K – 8 Teachers: Geometry Western Kentucky University – Summer 2022

Section Number: C01 Instructor: R. L. Ayers Email: <u>robin.ayers@wku.edu</u> Class Times: MTWRF 10:30 am -12:10 pm Classroom: COHH 3122 Office: COHH 3112

**Course Description:** 3 Credit Hours - Conceptual development of fundamental concepts of geometry and measurement.



Diversity, Equity, and Inclusion will serve as the foundation for a learning environment in my classroom. Whether you are short, tall, or in between, you will have a place in my classroom. For I am a tall woman to some and short to others. I am a woman of color, and all colors produce a beautiful picture to admire, study, and learn from. I am first generation; I am a proud Army Brat. I have learned from many cultures and traveled to my towns, cities, states, and lands. I want my classroom to be a zone free of hate, indifference, and intolerance. I am a friend, a mother, a sister, and a daughter. Together we can learn from each other. Together we can teach each other. Together we can promote and teach acceptance in my classroom. I am woman of STEM (science, technology, engineering, and mathematics), I am WISE (woman in science and engineering), I am an educator. You may not like my subject, and I will not judge you, but I will help you to appreciate the beauty it has to offer. I wear many badges of honor and I am Diverse and will promote this throughout this learning experience. I am Equity and will be sure that all are treated as I would like to be treated, with respect and dignity. I am Inclusion and will be proud to include all in the learning process.

Learning Objectives: Upon Successful Completion of MATH 206, students will be able to:

- 1. Determine when computations are needed and execute them appropriately in nonmetric geometry.
- Identify and interpret information of basic geometry topics such as (1) Angle Geometry (2) Perimeter & Area–2D (3) Surface area & Volume–3D, and (4) Triangle Geometry
- 3. Determine when computations are needed and execute the appropriate computations in measurement (standard and metric systems)
- 4. Utilize the appropriate model to solve problems involving motion geometry
- 5. Construct geometric shapes using tools and computer software
- 6. Use dynamic mathematics software programs to enhance conceptual understanding of Euclidean geometry

**Prerequisites:** Completion of MATH 205 with a grade of C or better; for students in Elementary Education, Middle Grades Mathematics Education, or Special Education Teacher Certification programs only.

**Textbook:** No textbook is required. You are required to purchase a MATH 206 Course Packet directly from the WKU Bookstore. The course packet includes Syllabus, Tentative Schedule, Assignments Record, Classwork, and Homework Assignments. You should bring the packet with you to every class!

**Classroom Materials:** You should bring a variety of pencils, pens, colored pencils, markers, and/or highlighters to class with you every day. A protractor and ruler (inches and centimeters) may be a good thing to have also. In addition, you need to bring a three-ring binder containing your handouts, worksheets, assignments, and some extra paper. The binder will help you keep all of your work organized throughout the semester, and you will need the course writing utensils to complete the daily classwork assignments.

**Course Content & Instruction:** MATH 206 may be different than any course you've had before, even if you have previously taken MATH 205 or 308 with us at WKU. The content of this course is geometry, and for a lot of students, geometry looks and feels different from other areas of mathematics. While much of the mathematics you have studied up to this point has centered around numeration and operation, the discipline of geometry relies very heavily on visualization, but also on writing, interpreting, and understanding very precise definitions. You will spend a great deal of time in this course developing those skills among many others!

This course is listed as a math course, and you certainly will study mathematics, but not the kind of mathematics you've studied before. In this course you will learn the mathematics needed to become an effective teacher. What kind of mathematics do teachers need to know? It is mathematics that helps teachers understand how their students are thinking about mathematics and how they can help their students deepen their understanding. It is mathematics that helps teachers see how the different topics in elementary and middle school mathematics fit together and how they can help their students move from easier topics to more challenging topics. It is mathematics that helps teachers re-examine what they have learned before so they can understand the underlying concepts, and so they can effectively support their students' learning.

This is a new kind of mathematical knowledge for you. Learning this mathematics requires that you start fresh. It requires that you become genuinely curious about how and why all those rules in mathematics work like they do, about how children think about mathematics, about the methods children are likely to use to solve mathematical problems and why some of these methods are useful for them and some are not, and about what kinds of mathematical understandings are essential for children to acquire.

Because you will be learning a new kind of mathematics, you will notice very soon that you are not doing the usual kinds of things. You will not be shown how to do sample problems and then asked to practice more on your own. Instead, you will:

- Work problems posed to students in grades K-8 and predict how students might solve them.
- Solve new kinds of problems designed to provide insight into geometry and promote your mathematical reasoning skills. In doing so, you will understand familiar problems more deeply.
- Examine patterns and structure; formulate generalizations and conjectures; investigate and test your conjectures using concrete materials and other tools; and construct and evaluate mathematical arguments. You will learn to ask yourself: Is there a pattern? What might happen next? Can I make a generalization or conjecture? Do I think my conjecture is true for all cases, true for some cases, true for no cases (that is, false for all cases), and why? Under what circumstances is it not true? Can I give an example? Why does it work? How might I convince my group members that my conjecture is correct?
- Be asked to explain your reasoning how you were thinking while you were solving a problem, why you think students will solve problems in a particular way, and why you think some methods for solving problems work better than others. *Developing good explanations that are convincing to others is one of the best ways to verify that you truly understand.*

This course will be one of the more challenging courses you take as you prepare to become a teacher. This is because most of what you will learn will be new. You won't always be able to rely on what you've learned before. But, if you commit yourself to becoming an effective mathematics teacher and apply yourself, what you learn in this course will be invaluable. **Internet Access:** You must have regular and reliable access to your WKU email account and Blackboard. Lack of internet access or failure to login to these systems may not be used as an excuse for failing to obtain materials or turn in homework assignments. You should check your WKU email account daily, as all announcements for the class will be sent there.

Attendance and Absences: Attendance and participation in class is crucial to your success in this course. If you miss a class for any reason, you will be responsible for obtaining any materials and/or information from your fellow classmates, *not from the instructor*. Summary materials will be posted to Blackboard following each lesson.

Because this class is taught in a cooperative inquiry-based format, small group and whole class participation is an essential part of the experience for both you and your classmates. Consequently, absences by individual students hurt not only that student, but also the rest of the class. Furthermore, as a future educator, you must get in the habit of showing up on time every day ready for work! Excessive absences from class will result in a lowering of your overall grade in the course as follows:

Number of Absences	0 – 2	3	4	5	6
<b>Grade Lowered</b>	None	<b>One Letter</b>	<b>Two Letters</b>	<b>Three Letters</b>	<b>Four Letters</b>

The only exceptions to this policy will be those absences that are caused by university approved activities or religious observances for which documentation has been provided to the instructor in advance. All other absences (sickness, death in the family, grandmother in hospital, vacation, car issues, and so on) will not be excused. You get two free absences to cover these unexpected events. If you have extenuating circumstances, you may be eligible for other options including medical withdrawal, incomplete, audit, and so on.

**WKU Syllabus Statement on COVID-19:** All students are strongly encouraged to <u>get the</u> <u>COVID-19 vaccine</u>. Out of respect for the health and safety of the WKU community and in adherence with CDC guidelines and practices of all public universities and colleges in <u>Kentucky</u>, the University requires that a cloth face covering (reusable or disposable) that covers both the nose and mouth must be worn at all times when in public areas within all buildings. Students must properly wear face coverings while in class regardless of the room size or the nature of the classroom activities. Students who fail to wear a face covering as required will be in violation of the WKU Student Code of Conduct and will be asked to comply or will face disciplinary action, including possible dismissal from the University. Accommodations can be requested in special cases through the Student Accessibility and Resource Center (<u>SARC</u>): <u>270-745-5004</u> (voice), <u>270-745-3030</u> (TTY), or <u>270-288-0597</u> (video).

All students must immediately report a positive Covid-19 test result or close contact with a person who has tested positive to the Covid-19 Assistance Line at 270-745-2019. The assistance line is available to answer questions regarding any Covid-19 related issue. This guidance is subject to change based on requirements set forth by public health agencies or the office of the governor. Please refer to the Healthy on the Hill website for the most current information. www.wku.edu/healthyonthehill

**Arriving Late or Leaving Early**: In order to be counted present (not absent) for class, you need to be in the classroom for the entire class period. If you arrive late, leave early, or leave during the middle of class, you will accrue one-half of an absence. It is important that you take care of all of your personal needs before arriving to class. If you feel that you have an extenuating circumstance that requires a one-time exception to this policy, please discuss it with your instructor. If you need a more permanent exception, you will need to provide documentation from the Student Accessibility Resource Center.

**Cell Phones and Portable Electronic Devices:** Cell phones and other electronic devices provide a distraction to the learning environment for both the users and those around them. In order to provide the best environment for learning that we can, we will be attempting to make our classroom a cell phone free zone. We will provide a place to store cell phones during class. It is expected that all cell phones & smart watches be silenced (no vibration) and placed in this location for the duration of class. Any student found to be using (or looking at) a cell phone or other device during class will accrue one-half of an absence for that day. If you feel that you have an extenuating circumstance that requires a one-time exception to this policy, please discuss it with your instructor.

Assessment and Grading: Your grade in the course will be based on the following:

**Exams:** There will be three regular exams (worth 100 points each) and one cumulative final exam (worth 125 points) to measure your understanding of the course material. The exams will be taken during normal class times. More information about the dates and and locations of the exams will be announced in class and on Blackboard well in advance of the exams.

**Homework:** Homework will be assigned following each class meeting. These assignments are designed primarily as learning tools and will be checked daily at the very beginning of class for a combination of completeness and correctness. You will earn 1 point for each <u>satisfactory</u> homework assignment you submit. Homework assignments are worth a total of 25 points. If you satisfactorily complete all, you will earn 2 bonus points. Please note that you must be in class when homework is checked to earn homework points. Late assignments will not be accepted.

**Determination of Final Course Grade:** The above assessments provide a total of 450 possible points in the course. Final course grades will be determined using the following scale:

Percentage	0% - 59%	60% - 69%	70% - 79%	80% - 89%	90% - 100%
Letter Grade	F	D	С	В	Α

*Note:* All missed exams will be given a grade of zero. Late homework assignments will not be accepted. The only exceptions to this policy will be those absences that are caused by university approved activities or religious observances for which documentation has been provided to the instructor in advance. The instructor will evaluate unexpected illness or unforeseen catastrophic circumstances on a case-by-case basis and determine whether a make-up is appropriate. Every effort must be made by the student to notify the instructor as soon as possible in these cases.

## **Understanding Course Grades:**

- A Pre-service teacher consistently demonstrates competencies that signal that s/he is proficient in the mathematical topics covered in the course. This qualification includes a deeper level of understanding than that expected of the students s/he is preparing to teach. Pre-service teacher demonstrates this level of understanding by consistently going beyond the information explicitly presented by the course instructor to completing new kinds of tasks. This ability to apply one's knowledge to new contexts and to put together various ideas is *essential* for effective classroom teaching because good teachers are able to respond to children's questions, to support and assess children's mathematical proficiency, and to interpret new curricula.
- **B** Pre-service teacher occasionally demonstrates the competencies and the knowledge transfer abilities that characterize the mathematical proficiency of A-level students, but at times is limited to learning well just the information explicitly presented by the course instructor. Pre-service teacher shows evidence of better-than-acceptable level of mathematical proficiency in the topics studied and a deeper level of understanding than that expected of the students s/he is preparing to teach.
- C Pre-service teacher consistently demonstrates good levels of performance on tasks measuring straightforward learning of course content, but rarely completes knowledge transfer tasks successfully. Shows evidence of an acceptable level of mathematical proficiency of the topics studied and shows evidence, although inconsistent, of a deeper level of understanding than that expected of the students s/he is preparing to teach.
- **D** Pre-service teacher does not consistently show acceptable levels of performance, even on tasks measuring content explicitly presented by the course instructor. Although the pre-service teacher may have mastered some of the course content, and s/he shows signs of considerable effort, serious questions persist about her/his mathematical proficiency and whether s/he has developed a deeper level of understanding than that expected of the students s/he is preparing to teach.
- **F** Pre-service teacher shows a profile similar to that of the D student but, in addition, appears to be unprepared to teach others at this time. Pre-service teacher consistently exhibits lack of effort, profound and persistent misconceptions, and/or the failure to master some of the course topics.

Academic Dishonesty: Students who commit any act of academic dishonesty will receive from the instructor a failing grade in the course without possibility of withdrawal. The instructor will also present the case to the Office of Student Conduct for disciplinary sanctions.

**ADA Statement:** In compliance with university policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at <u>sarc.connect@wku.edu</u>. Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

**Title IX Misconduct/Assault:** Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) and Discrimination and Harassment Policy (#0.2040) at

https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf https://wku.edu/policies/hr\_policies/2040\_discrimination\_harassment\_policy.pdf.

Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121.

Please note that while you may report an incident of sex/gender-based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and **MUST** report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

**Withdrawal Dates:** The last day to drop this course without a grade, without paying a fee, and to change from audit to credit is July 7, 2022. The last day to withdraw from this course with a W or change from credit to audit is July 26, 2022.

**Math Help Lab:** The department of mathematics provides a free help lab located in COHH 2124. Hours for the lab and specific tutor schedules are posted and will be announced in class or by email.

**The Learning Center:** The Learning Center (DSU 2141) provides free one-on-one tutoring and study areas available to all WKU students. For more information, or to schedule a tutoring appointment, please call TLC at (270) 745 - 6254 or visit their website at <u>www.wku.edu/tlc</u>

**Disclaimer:** The instructor reserves the right to change, alter, modify, or tweak anything in this document at any time for any reason.