

MATH 512: Geometry from an Advanced Perspective

Western Kentucky University – Spring 2023

Instructor: Nicholas Fortune
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Office: COHH 3111

Classroom: Online
Course Hours: At your leisure with deadlines
Office Hours: By appointment**

**I do not have set office hours for this class, but I am happy to meet with students via Zoom. Just send me an email and we can find a time to chat via Zoom.

Course Description: 3 Credit Hours – Topics in geometry from an advanced perspective including a theoretical examination of transformations in real and complex plane; distance congruence, and similarity in a variety of contexts; connections and applications between geometry, trigonometry, and calculus.

Learning Objectives: Upon completion of this course students will be able to:

- Analyze and generalize problems and their solutions.
- Write rigorous mathematical proofs.
- Reason and communicate proficiently in mathematics with regards to describing and explaining theory and application of geometry, trigonometry, and analysis.
- Make connections between topics taught in geometry, trigonometry, and analysis and in various contexts.

Prerequisites: Admission to the Master of Arts in Mathematics program or permission of instructor.

Textbook: I will be providing a PDF of the textbook that we will be using therefore it is not necessary to purchase anything. It is the same textbook/PDF as that used in MATH 511, we will just focus on Part II of the book. I do this because the book is no longer made. However, if you wish to purchase a used copy for yourself, you can find it on Amazon here:

<https://www.amazon.com/Mathematics-School-Teachers-Advanced-Perspective/dp/0130449415>

Mathematics for High School Teachers: An Advanced Perspective (1st Edition)
by Zalman Usiskin, Anthony L. Peressini, Elena Marchisotto, and Dick Stanley

Internet Access: You must have regular access to the internet to access email and the course website – Blackboard. This will help ensure that you do not fall behind. Please check your email regularly and save class emails for future reference.

Course Calendar: A course calendar will be posted, once the course begins. Be sure to consult this for an approximate course calendar with important dates. The course calendar may be updated throughout the semester.

Attendance Policy: We will not have a set meeting time when everyone will be online; however, you are expected to be online frequently each week to check your WKU email and the discussion board – this is VITAL. In a face-to-face class, we would meet in person just shy of 3 hours each week. In addition to this, you are expected to put in additional time outside of class

for reading, completing assignments, and studying – this is typically figured as 1 to 3 hours per credit hour per week. So, in a face-to-face class that can range from 6 to 12 hours a week for one class. I will expect you to do the same amount work as if this course was meeting in person. Make sure you do not get behind!

Assessment / Evaluation: The course grade will be computed as follows:

Discussion Boards (10%): Even though this is an online course that utilizes an asynchronous environment, your participation is **expected** and therefore required. All homework questions (content or technology) should be posted on the appropriate DB forum/thread located on Blackboard so that the entire class can benefit from the discussion that follows the question. Please **do not** email homework questions. If you do, I will ask you to post that question to the DB. The rationale for this policy is that I want all students to benefit from all questions/comments, just as students would in a face-to-face class. The only exception to this rule is a question of a personal nature – those should always be communicated privately.

In each forum, you are expected to post comments and/or questions about assignments. Most importantly, you should respond to classmates' questions – just as you would participate in conversations during group work in a classroom. As this “conversation” is not immediate in an online class, it is in your best interest not to wait until the last minute to work on your assignments. You should plan to spend time on the computer monitoring these discussions several days throughout the week. It is very important to keep in mind that while you may not have any questions to ask regarding problems that I assign, others will. Helping others is a GREAT way to reinforce your understanding of the material. In addition, sometimes you may think you think you understood a problem only to find out during a discussion that you were wrong OR that there were multiple ways to solve the problem. Participation in these discussions is a win-win situation.

Online discussions are a way for you to be “present” in class, like attendance in a face-to-face class. For each assigned DB, you will receive either 0 points or 1 point. If you meet all the requirements, you will receive the 1 point and if you do not you will receive a zero.

Exams (60%): Exams will be given during the semester. The exams will be split into two parts – one part timed and/or proctored and one part take-home. The take-home portion will include problems that require more in-depth work and/or technology not available in testing centers. There will be a window of time to complete both portions of the exam. Only in extreme circumstances will a student be allowed to take an exam later than the testing window. Details about the exams will be communicated via email after classes are underway.

Assignments (30%): Your homework assignments will be weekly problem sets which will be posted each week. Please consult the calendar each week for assignments. These assignments will be collected on a weekly basis and graded. More information about homework expectations can be found in the General Structure document posted on BB. You may at times want to consult mathematics sources in the library or on the internet. Feel free to share anything you reference with your classmates via the DB. You will find that doing the

assignments and corresponding with classmates or with the instructor will increase your chances for success on exams.

All assignments should be turned in via the links given. Any assignment uploaded on Blackboard for me to look at should be either a **Word document or a PDF file – no other file types**. Handwritten assignments are acceptable if they are neat and scanned as a pdf file – no picture files. All assignments should be turned in as **ONE file**.

Last assignments: If you need to request an assignment extension, please ask the instructor. They are not guaranteed and will be dealt with on a case-by-case basis.

Determination of Final Course Grade: The above assignments and assessments are weighted according to the noted percentages. 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	C	B	A

Understanding Course Grades:

- A** Pre-service or in-service teacher consistently demonstrates competencies that signal that they are proficient in the mathematical topics covered in the course. This qualification includes a deeper level of understanding than that expected of the students they are preparing to teach. Pre-service or in-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 or in-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 or in-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 they are preparing to teach.
- C** Pre-service or in-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 they are preparing to teach.
- D** Pre-service or in-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 or in-service teacher may have mastered some of the

course content, and they show signs of considerable effort, serious questions persist about their mathematical proficiency and whether they have developed a deeper level of understanding than that expected of the students they are preparing to teach.

- F Pre-service or in-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 or in-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.

WKU Statement on COVID-19: All students are strongly encouraged to [get the COVID-19 vaccine](#). In accordance with WKU policy, all students must call the WKU COVID-19 Assistance Line at 270-745-2019 within 4 hours of testing positive for COVID-19 or being identified as a close contact to someone who has tested positive. The COVID 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 federal, state, and local public health entities. Please refer to the Healthy on the Hill website for the most current information.
www.wku.edu/healthyonthehill

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, Room 1074. The SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu. 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 [Sex and Gender-Based Discrimination, Harassment, and Retaliation](#) (#0.070) and [Discrimination and Harassment Policy](#) (#0.2040). 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 Executive Director, Office of Institutional Equity/Title IX Coordinator, Ena Demir, 270-745-6867 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.

Regular and Substantive Interaction (Online Courses Only): The U.S. Department of Education requires that distance education courses must include regular and substantive interaction between students and faculty. For more information about Regular and Substantive

Interaction at WKU, please visit the [Regular and Substantive Interaction in Online and Distance Learning webpage](#). In this course, regular and substantive interaction will take place in the following ways:

- Regular communication via email or announcements made on Blackboard,
- Regular participation in weekly discussion boards, and
- Timely and detailed feedback on assignments provided within one week of submission.

Withdrawal Dates: The last day to drop this course without a grade, without paying a fee, and to change from audit to credit is Tuesday, January 24. The last day to withdraw from this course with a W or change from credit to audit is Thursday, March 30.

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