

GEOMETRY FOR TEACHERS

MATH 456 | SPRING QUARTER 2022

INSTRUCTOR

Dr. Mark Oursland
Office: Science II 301D
Office Hours: M-F 9-11AM *other times by appointment suggest media that works for you*

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COURSE DESCRIPTION

This course is a mix of the basic principles of geometry with concept connection to other disciplines. Connections to trigonometry and transformational geometry will be studied and applied to real world problems. The underlying theme will be to model both processes and content of mathematics studies of geometry as they directly apply to the middle level mathematics classroom.

COURSE RATIONALE

Geometry is a basic part of the high school curriculum and the NCTM recommended that “Prospective teachers need mathematics courses develop a deep understanding of the mathematics they will teach”. This course will begin with high school geometry and make deep connection to all areas of mathematics. This course will also develop a deep understanding of when and how to use proof to communicate understanding of mathematical concepts.

COURSE OBJECTIVES

Students will be able to:

Outcomes	Assessments	Standards
define geometric concepts critical to the intuitive and logical development of geometry.	Written problem solutions, group projects, weekly quizzes, exams, and final exam.	WSMS 1,4,8
construct geometric figures using multiple technologies and methods, including those classical straight edge and compass techniques.	Written problem solutions, group projects, weekly quizzes, exams, and final exam.	WSMS 4,8
conjecture, prove, give counterexamples, and evaluate conjectures, proofs, and counterexamples for correctness, elegance, and utility.	Written problem solutions, group projects, weekly quizzes, exams, and final exam.	WSMS 1,4,8
make connections among geometry, other areas of mathematics, real world phenomena, and science.	Written problem solutions, group projects, weekly quizzes, exams, and final exam.	WSMS 1,4,7,8
contribute to the class knowledge base in a professional manner that includes preparation, courtesy, and respect for others.	Written problem solutions and group projects	WSMS 1,8
communicate geometric and pedagogical ideas with others in a clear and concise manner, properly using the language of mathematics, specifically, and geometry.	Written problem solutions, group projects, weekly quizzes, exams, and final exam.	WSMS 1,4,7,8

COURSE RESOURCES

[Canvas](#) Check course announcements, messages, due dates, assignments and feedback before *each* class. Read the Home page of the CANVAS MATH 456 course before starting the course. No textbook, a translation of Euclid’s Elements is included as pdf file. Students will need a compass and straight-edge and access to a computer with the free program Geogebra.

ASSIGNMENTS AND EVALUATION GUIDELINES:

The instructional and assessment strategies for this course are designed to inform you of your progress in achieving the performance objectives. The instructors will give you feedback on your progress in meeting performance outcomes.

Assignment	Points
4 reasoning assessments (80 points)	8.3%
4 problem solving assessments (80 points)	8.3%
4 application of technology (80 points)	8.3%
4 basic knowledge and skills worksheets (80 points)	8.3%
4 teacher hat reflection papers (80 points)	8.3%
4 exams (400 points)	41.8%
Group modeling project(160 points)	16.7%

COURSE ACTIVITIES

The course will consist of module activities done individually and shared in group and whole class. Each module also contains multiple individual CANVAS assignments, a group project, geogebra assignments, and an on-line test. You will need to communicate what you know and have questions in small group and whole class discussions. After you have completed all group and individual work you will complete the reflection teacher hat paper, and finally the module exams will be on-line in CANVAS, these exam must be taken on the day assigned and you have one hour to take the exam. Contact your instructor if you need different accommodations. Finally, there will be an on-line comprehensive final.

GRADING SCALE

93-100% = A, 90-93% = A-, 87-90% = B+, 83-87% = B, 80-83% = B-, 77-80% = C+, 73-77% = C, 70-73% = C-, 67-70% = D+, 63-67% = D, 60-63% = D-, 0-60% = F See CWU Catalog for the eligibility requirements for an incomplete.

COURSE POLICIES

Instructor Feedback/Communication

Send the instructor e-mails, phone calls, or visit his office if you would like to talk about the course. The Announcements tool in CANVAS to communicate changes to the course and other course information.

Suggestions for Success

Take the responsibility for your own achievement of these performance objectives. You can get individual help by e-mail or in person in my office. If at any time you have trouble using CANVAS or do not understand an assignment make sure to contact the instructor. Use the activities, assignments, assessments, and people (instructor and peers) to ensure that you understand the mathematical teaching concepts and can demonstrate this understanding in the form of the performance objectives.

Student Feedback/Communication

I welcome all feedback on the course. My preferred method of communication with individual students is via email. I am also available for office hours. If you experience a legitimate emergency, which will prevent you from completing required coursework on time, contact the instructor at earliest opportunity. Please state the nature of the emergency and when you expect to turn in the coursework.

Submitting Electronic Files

All electronic files must be submitted in .doc or .pdf format. If you do not have Microsoft Word, you can download Open Office Writer for free at <http://www.openoffice.org/>.

Late Work

Late work will be given reduced points depending on how many days the assignment is late. If you complete an assignment a couple days late only one point will be deducted, but if it is a week or more, then 25% of the possible points will be deducted. You must complete 100% of the exams and 75% of the assignments to pass the course regardless of the course grade. The due date and times associated with assignments are clearly stated in CANVAS.

STUDENT SUCCESS

Multiple resources are available to help students move past challenges and become academically successful.

Academic Success Center

The CWU Academic Success Center helps students learn strategies that can increase GPA and improve course pass rates. All services are available online via Zoom unless otherwise noted. Expanded hours are available to meet student need. To access, go to www.cwu.edu/asc or <https://tutortrac.cwu.edu>, use your CWU login and password, and click the [Schedule an Appointment](#) link.

Tutors

Several forms of peer tutoring are available. All Canvas courses include a direct link to a tutoring resources page. The PALS program pairs a trained tutor with a faculty member to promote learning strategies and content comprehension in specific courses. eTutoring allows students to get online help in 15 subjects with expanded hours of 5am-midnight, 7 days per week. To access, students visit www.etutoringonline.org, select CWU, and request a password link be sent to their CWU email address. A list of subjects is available at <https://www.cwu.edu/academic-success/online-tutoring/online-tutoring>

Academic Coach

Students can work one-on-one with an [academic coach](#) in individualized sessions that focus on building academic strength. Students can improve time management, develop a study plan, unpack how to process new information for deep understanding, increase reading and comprehension skills, and more. Coaches help students discover learning best strategies, maximize academic experiences, and reduce stress.

Writing Center

Learning to write well can be a difficult skill set to develop, a process made easier via targeted feedback via the [CWU Writing Center](#). Students submit papers for review and receive detailed video comments from writing consultants in various disciplines. Students can also request a phone consult. Best results are achieved when students plan early for multiple rounds of feedback and revision.

Math Center

Learning mathematics is challenging for many students. Students who struggle with math can access the [CWU Math Center](#). Students can connect with a math tutor for live help sessions that deal with all Quantitative Reasoning, 100-level, and other math courses. Zoom meetings, whiteboards, and other tools are used to promote deeper understanding of mathematics.

UNIVERSITY POLICIES

Academic Honesty

Consult university policies ([CWUP 5-90-040\(22\)](#), [CWUR 2-90-040\(22\)](#), and [WAC 106-125-020](#)) for student conduct, cheating, plagiarism, and other academic expectations. CWU's policies and recommendations for academic misconduct will be followed, leading to disciplinary action up to and including failing the course.

DIVERSITY

As a member of a peer learning community, a high degree of professionalism is necessary. **CWU expects every member of the university community to contribute to an inclusive and respectful classroom culture.**

Disability Support Services

Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations: Hogue Hall 126, [509.963.2214](tel:509.963.2214), DS@cwu.edu

Religious Holiday Absences - Is my absence excused?

Excused absences will not lower your overall grade in this class and are determined on a case-by-case basis. In compliance with RCW 28B.137.010, Central Washington University makes every effort to deal reasonably and fairly with students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students must present written notice to their instructor within the first two weeks of class listing the specific dates on which accommodations are required. Contact the Dean of Student Success at [509.963-1515](tel:509.963.1515) for further information or questions.

COVID Statement 2022

Spring quarter 2022, CWU will continue to require face coverings through the end of the day Friday, April 8, inside all classrooms and at large indoor gatherings with 500 or more people. Unless otherwise communicated, the CWU mask mandate will end for all indoor spaces on the Ellensburg campus at the end of the day Friday, April 8.