

Course: Math 338 - Geometry For Teachers.

Catalog Description: 3 Hr. Prerequisites: MATH 156 with a minimum grade of C- and PR or CONC: consent. MATH 283 with a minimum grade of C- or consent. (For prospective teachers of Geometry.) Foundations of geometry. Special topics from Euclidean and non-Euclidean geometries needed for teaching high school mathematics.

Semester: Spring 2021

Course Format: 3 hr Lecture.

Prerequisites: Prerequisites: MATH 156 with a minimum grade of C- and PR or CONC: consent. MATH 283 with a minimum grade of C- or consent.

Instructor: Dr. Laura Pyzdrowski 411 Armstrong Hall, lpyzdrow@math.wvu.edu

Schedule: Class: Tuesday & Thursday – 1:00 – 2:15
Final: Saturday, May 8 1:00 – 3:00
Location: Online
Office Hours: Tuesday and Thursday after class or by appointment

Course Objective: The primary course objective is to prepare students to teach geometry by providing an opportunity to learn the appropriate content and processes specified by various stakeholders. Course content will contain topics from Euclidean and non-Euclidean Geometries. Laboratories and activities will be completed to investigate and expand related concepts using interactive technologies and other internet resources. It is anticipated that readings from the book will be supplemented by other resources and materials such as movies, interactive laboratory applications, outside readings, and activities.

Expected Learning Outcomes: Upon successful completion of this course:

1. Students will be able solve authentic and historical problems using geometry and problem-solving strategies.
2. Students will be able to explain why properties of geometry make sense by explaining concepts illuminated by concrete models.
3. Students will be able to develop formal and informal proofs and arguments using deductive and inductive reasoning.
4. Students will be able to solve problems involving geometric structures and applications of algorithms using technological tools.
5. Students will be able to explain the interconnectedness of mathematical ideas and how they build on one another and recognize and apply mathematical connections among mathematical ideas and across various content areas and real-world contexts.
6. Students will analyze and represent fundamental concepts of geometry using technology.
7. Students will be able to collaboratively consider and communicate mathematical ideas effectively, both in writing and in speaking.

Required Text:

College Geometry: A Problem-Solving Approach with Applications, 2nd edition

Authors: Musser, Trimpe and Maurer

Publisher: Pearson

ISBN: 978-0-13-187969-0

Equipment Needed:

Although students may not be allowed to use calculators for some assignments and tests, students are expected to have a calculator (a graphing calculator is not required) at each class meeting, lab and testing session. Cell phone calculators are not permitted, nor may calculators be shared. In addition to a calculator, students will be required to purchase and use a compass, protractor, and a straight edge.

Grading: Your final grade will be calculated using grades from homework, quizzes, laboratories, activities, a paper and exams.

Homework and Quizzes- 20%

Exams (Three Exams (30%) and Final (20%)) - 50%

Laboratories and In-Class Activities -20%

Geometry Paper – 10%

Total - 100%

Grade Assignment:

100 – 90 A

89 – 80 B

79 – 70 C

69 – 60 D

59 – 0 F

Grading Policy:

- There are no make-up exams except by prior arrangement with instructor.
- Late assignments will only be accepted at the next class meeting with a 10% penalty.
- Exam grading appeals must be submitted in writing on the day the exam is returned.
- In-class activities, laboratories, and quizzes may not be made up.
- Midterm grades are calculated by adding the grades from Exam 1, the average from the homework and quizzes (to date) and the average from the laboratories and in-class activities (to date) and then dividing that sum by 3. This accounts for at least 20% of your final course grade.

Assignments: Assignments will typically be given once or twice weekly. Both individual and group assignments will be made. All group and individual assignments are weighted equally.

The Learning Outcomes for this course include that students will work collaboratively while exploring geometry and will communicate mathematical ideas effectively, both while writing and speaking. In order to facilitate your experiences, you will be assigned to a team. Ten percent of group laboratory/activity points are awarded for the ability to do and communicate about mathematics and to manage your time and follow directions. Any group laboratories/activities not submitted as a team effort (2-3 students), will not be awarded communication points.

Attendance Policy: Consistent with WVU guidelines, students absent from regularly scheduled examinations because of authorized University activities will have the opportunity to take them at an alternate time. Make-up exams for absences due to any other reason will be at the discretion of the instructor. Missed in-class assignments may not be made-up.

Inclusivity Statement: The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Accessibility Services (293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see <http://diversity.wvu.edu>.

Academic Integrity: The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, instructors will enforce rigorous standards of academic integrity in all aspects and assignments of their courses. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Standards Policy (<http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification>). Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see your instructor before the assignment is due to discuss the matter.

Sale of Course Material Statement : All course materials, including lectures, class notes, quizzes, exams, handouts, presentations, and other course materials provided to students for their courses are protected intellectual property. As such, the unauthorized purchase or sale of these materials may result in disciplinary sanctions under the [Student Conduct Code](https://studentconduct.wvu.edu/campus-student-code). (<https://studentconduct.wvu.edu/campus-student-code>) [adopted 5-11-2015]

Important Withdrawal Dates for the Semester: April 16, 2021 is the Last Day to Drop a Class and Last Day to Withdraw from the University.

Tentative Schedule: The effective use of quantitative and scientific knowledge and application of knowledge, methods, and principles of inquiry to understand geometry is woven throughout the course.

A compilation of problems from the textbook, laboratories, readings, and media assignments will be assigned on a weekly basis.

Tentative Week Topic:

- I. Introduction & Problem Solving in Geometry
- II. Geometric Shapes and Measurement
- III. Geometric Shapes and Measurement
- IV. Perimeter, Area and Volume
- V. Reasoning and Triangle Congruence and **TEST 1**
- VI. Reasoning and Triangle Congruence
- VII. Parallel Lines and Quadrilaterals
- VIII. Parallel Lines and Quadrilaterals
- IX. Similarity
- X. Circles and **TEST 2**
- XI. Circles
- XII. Transformation Geometry
- XIII. Transformation Geometry
- XIV. Non-Euclidean Geometry **and TEST 3**
- XV. Non-Euclidean Geometry

Comprehensive Final