

Metropolitan State University
College of Arts and Sciences
MATH 370-01 Modern Geometry

Term: Spring 2017
Meeting: Thursdays 6—9:20 pm
Instructor: Dr. Pangyen Ben Weng, Associate Professor of Mathematics
Email: Pangyen.Weng@metrostate.edu
Office: Saint Johns Hall 314
Office Hours: Monday 12—3p, Wednesday 10—2 and Thursday 10—2.
Office hours are by appointment only. Students are welcome to inquire my availability at other times.

Course Description: This course goes beyond the Euclidean Geometry typically taught in high schools. This is a modern approach to geometry based on the systematic use of transformations. It includes a study of some advanced concepts from Euclidean Geometry and then proceeds to examine a wide variety of other geometries, including Non-Euclidean and Projective Geometry. A working knowledge of vectors, matrices, and multivariable calculus is assumed.

Learning Outcomes:

1. Compare/contrast the development, axioms and/or postulates and theorems of Euclidean and Non-Euclidean geometries.
2. Define and understand mathematical axiomatic systems and their properties.
3. Present concepts of Euclidean geometry from a transformational viewpoint.
4. Use hypotheses to draw valid conclusions and to avoid making invalid arguments.

Textbook: *Geometry for College Students* by Isaacs. ISBN: 9780821847947

Prerequisite: The prerequisite for this course is C- or higher in MATH 310 Calculus III: Multivariable Calculus.

Technology: This course does NOT require calculators and any computing device. You need a computer for LaTeX and preferably a tablet device for drawing graphs.

Homework: Mathematics is not a spectator's sport. Problem-solving and proof-writing are the only ways to strengthen your comprehension and skills in mathematics. Homework is an important part of your learning, and you must expect to spend at least 8 to 10 hours each week on studying and doing assignments. **No late homework will be accepted.** Present your homework problems in the order they are given.

Participation: Attendance is required. Students are also asked to answer preview questions, work in front of class and discuss with classmates.

Paper and presentation: Students are required to read an additional book on geometry, make a presentation, and write a book report. Details of paper and presentation will be announced in a separate document by the second class meeting.

Exams: There are two 3-hour exams. Notes are allowed in exams.

Course Requirements and Grading Policy: Letter grades are given based on the following scale. Students who are NOT eligible for any of the 4 grades automatically receive an F.

	I	C	B	A
Participation	<input type="checkbox"/> ≥ 70%	<input type="checkbox"/> ≥ 75%	<input type="checkbox"/> ≥ 80%	<input type="checkbox"/> ≥ 90%
Homework	<input type="checkbox"/> ≥ 70%	<input type="checkbox"/> ≥ 75%	<input type="checkbox"/> ≥ 80%	<input type="checkbox"/> ≥ 90%
Paper/presentation		<input type="checkbox"/> ≥ 70%	<input type="checkbox"/> ≥ 80%	<input type="checkbox"/> ≥ 85%
Exams		<input type="checkbox"/> ≥ 70%	<input type="checkbox"/> ≥ 80%	<input type="checkbox"/> ≥ 85%

Policy on Academic Integrity: The Metropolitan State University Student Handbook states *“In simple terms, plagiarism is using another person’s words or ideas and presenting them as your own, without acknowledging the original source. This is a serious academic offense. Academic sanctions can include receiving a failing grade for an assignment or an entire course.”*

Assignments and exams are to be completed independently unless specified otherwise. Copying and/or utilizing another person’s work in order to complete your assignments or exams constitutes plagiarism. In situations where I suspect academic dishonesty, I reserve the right to either reassess your understanding of the material or assign a grade of 0 points. Repeated offenses will result in a grade of F for the entire course. For additional information on the university’s policies regarding plagiarism, please refer to the student handbook found at <http://www.metrostate.edu/msweb/pathway/gateway/handbook/handbook.html>.

Classroom Diversity: The instructor strives to provide a welcoming learning environment to students of diverse backgrounds with diverse learning needs. Students who have questions or concerns about the course policy or how the course is conducted are encouraged to discuss them with the instructor.

Students with Disabilities: Special accommodations can often be made for those with learning disabilities. Students who have or may have documented learning disabilities are recommended to contact the instructor as well as the Disability Services Office at (651) 793-1540 or (651) 772-7687.

Email Communication: In accordance with University’s policy, this class will use your university email address (name@metrostate.edu) to communicate with you about all course-related matters.

Tentative Schedule:

Date	Coverage	Suggested problems	Scheduled event
1/12 1/19 1/26 2/2	Chapter 1 1B Congruent Triangles 1C Angles and Parallel Lines 1D Parallelograms 1E Area 1F Circles and Arcs 1G Polygons in Circles 1H Similarity	(p. 10) 1, 2, 3, 4, 5, 6 (p. 17) 1, 2, 3, 4, 7, 10 (p. 23) 1, 2, 3 (p. 32) 3, 5, 8, 9 (p. 38) 1, 2, 3 (p. 48) 1, 2, 3, 5, 6	Homework 1: 1/19 Homework 2: 1/26 Homework 3: 2/2 Homework 4: 2/9
2/9 2/16 2/23	Chapter 2 2A The Circumcircle 2B The Centroid 2C The Euler Line, etc. 2D Computations 2E The Incircle 2F Exscribed Circles 2G Morley's Theorem 2H Optimization in Triangles	(p. 55) 1, 2, 3 (p. 59) 1, 2 (p. 66) 1, 2, 3 (p. 72) 1, 2, 3 (p. 79) 1, 2, 3 (p. 81) 1, 2 (p. 85) 1 (p. 93) 1	Homework 5: 2/16 Homework 6: 2/23
3/1	Exam I		
3/8	Spring break no class		
3/15 3/22	Chapter 4 4A Ceva's Theorem 4B Interior and Exterior Cevians 4C Ceva's Theorem and Angles 4D Menelaus' Theorem	(p. 145) 1, 2 (p. 153) 1, 2, 3	Homework 7: 3/15 Homework 8: 3/22 Homework 9: 3/29
3/29 4/6 4/12	Chapter 6 6A Rules of the Game 6B Reconstructing Triangles 6C Tangents 6D Three Hard Problems 6E Constructible Numbers	(p. 187) 1, 2, 3, 4, 5 (p. 191) 1, 2, 3, 4 (p. 196) 1, 2, 3, 4, 5 (p. 203) 1, 2 (p. 208) 1, 2	Homework 10: 4/6 Homework 11: 4/12
4/19	Exam II		
4/26	Presentations		