

Mathematics 67-415 (4 credits)
Modern Geometry for Elementary and Middle School Programs
Fall 2009

Instructor: Dr. Amy Parrott

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Prerequisites: 67-104 (College Algebra or equivalent), 67-211 (Geometry and Measurement) and 67-217 (Data Exploration and Analysis) **each** with a grade of a C or better.

Course Objectives: This course is designed to prepare future middle grade math teachers and elementary grades math specialists for the work of teaching geometry. We will focus on geometry from several perspectives: 1) as an axiomatic system; 2) as an exploration of shapes and properties of shapes in the plane; 3) as an exploration of shapes and properties of shapes in spaces other than the plane. We will examine problems and ideas from the National Council of Teachers of Mathematics and from upper elementary and middle school curriculum materials that help foster geometric thinking in children. Finally, we will study the historical development of geometric thinking.

Office Hours: I encourage you to stop by my office whenever you have questions about the material covered in class or a current assignment. You may also stop by if you just want to chat about mathematics and/or education or anything else on your mind. I am available:

- Monday-Tuesday-Wednesday 2:00-4:00
- Friday 3:00-4:00
- I am happy to meet with you during other times if these do not work with your schedule. Please see me after class or send me an email to schedule a time.

Textbook:

Big Ideas in Mathematics for Future Middle Grade Teachers and Elementary Math Specialists: Big Ideas in Geometry by Carol Seaman and Jennifer Szydlik. This text is available from the bookstore.

Required Materials:

In addition to your textbook, you will need the following for class: compass, protractor, ruler, scissors, tracing paper, graph/grid paper and markers/colored pencils. Please bring these items to class every day.

Course Outline:

Unit 1: Finite Geometries: A Focus on Axiom Systems (2 weeks).

Unit 2: Euclid's Geometry (6 weeks).

Unit 3: Non-Euclidean Geometry (6 weeks).

Format and Attendance Policy: The ideas of this course will be introduced through interesting hands-on activities and problems. Class time typically will be spent working on those problems together and discussing and presenting strategies and solutions. You will be responsible for

completing readings and working on problems sets and projects outside of class. Because it is so important for not only your own learning, but the learning of your fellow classmates, I expect that you will attend and fully participate in class. It is your responsibility to inform me if you must miss class for any reason and to understand the material that you missed. Your course grade may suffer if you miss too many class periods.

Grading: Your grade in this course will be based on:

- Written work (25%) This category may include problem write-ups*, short papers, quizzes or homework sets from the text.
- Three in-class exams (15% each) The dates of the exams are: Friday, October 16, Friday, November 13 and Friday, December 18.
- Two Group project (15% each) One group project will focus on historical aspects of geometry and the other will focus on educational aspects of geometry.

The grading scale will be no stricter than:

A: 92-100%	A-: 90-92%	
B+: 88-89%	B: 83-87%	B-:80-82%
C+: 78-79%	C:73-77%	C-:70-72%
D+: 68-69%	D:63-67%	D-:60-62%
F: 0-60%		

***Guidelines for Problem Write-ups:** Problem write-ups should be typed (you may hand draw diagrams or write mathematics in ink) and include the following four sections:

- 1) (3 pts) an explanation of the question or problem (Convince me you understand the question and define ambiguous terms or notation.)
- 2) (6 pts) a description of your problem-solving *strategies* (What did you do to work on the problem? Be specific. Include any data, tables, or sketches as appropriate)
- 3) (8 pts) the solution (what is the answer to the question(s)?), and
- 4) (8 pts) an explanation of the solution (Why does your solution make sense mathematically? Argue that it is complete (there are no other solutions) and prove it is correct.)

Academic Honesty Policy:

Cheating on an exam, plagiarizing or any other form of academic dishonesty will be dealt with in accordance with the current UWO Student Discipline Code. The instructor reserves the right to assign a grade of “F” for the course should