Mathematics 67-415 (4 credits)
Modern Geometry for Elementary and Middle School Programs
Fall 2008

Pre-requisites:	67-110 (Number Systems), 67-211 (Geometry and Measurement) and 67-217 (Data Exploration and Analysis), **each** with a grade of C or better.
	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.
Instructor:	Dr. Jennifer Szydlik
Phone/email:	424-7350, szydlik@uwosh.edu
Office:	Swart 218
Office Hours:	Monday and Wednesday 3:00 – 4:00; Tuesday 11:30 -12:30; Thursday 12:40-1:40 and other times by appointment. I am happy to meet with you; just let me know if you would like an appointment.
Textbooks:	*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.
Instructional Format:	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.

Course Outline: Finite Geometries: A Focus on Axiom Systems (4 weeks).
Axiom systems and models; some important logical
distinctions; Van Hiele Levels; projective planes.

Euclid's Geometry (5 weeks).
Euclid's axioms and terms; the Pythagorean theorem;
classical problems; constructions; analytic geometry; conics;
and transformations.

Non-Euclidean Geometry (5 weeks).
The Mobius strip, Taxicab geometry; spherical geometry;
hyperbolic geometry; and fractal geometry.

Assessment: We will have three exams: Each exam is worth 15% of your
course grade. The dates of those exams are Friday, October
3rd; Friday November 7th, and Friday, December 12th.

Written work (problem sets, quizzes or problem write-ups) will
comprise 25% of your grade in the course.

You will each complete two group projects. One will focus on
the history of geometric thinking and the other will focus on an
educational aspect of geometric thinking. Each is worth 15%
of your grade.

The grading scale will be approximately as follows:

A	90 - 100% of the course points
B	80 - 89%
C	70 - 79%
D	60 - 69%
F	0 - 59%

Intermediate grades (e.g., AB, BC, and CD) will be assigned
as final grades if you are close to the cutoff for the next
highest grade.