

SU DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE
 SYLLABUS (*Tentative*)
 MATH 430/530 Mathematical Connections for Secondary School Teachers

- Objective:** To connect the undergraduate mathematics curriculum to the secondary mathematics curriculum by examining high school curriculum topics from an advanced and historical perspective with the goal of deepening understanding of the mathematics required for teaching in secondary schools. We will consider contributions from diverse cultures as we examine the historical development of numbers and number systems, algebra, Euclidean and non-Euclidean geometries, calculus, discrete mathematics, statistics, probability, and measurement.
- Intended for:** Secondary education majors in Mathematics.
- Requirements:** Sced 373 and Math 441 or Math 451
- Texts:** *Mathematics for High School Teachers: An Advanced Perspective.*
Math through the Ages: A Gentle History for Teachers and Others

	Weeks
<i>Real Numbers</i>	2
Rational and irrational numbers, the number line and decimal representations of real numbers, periods of periodic decimals, the distributions of various types of real numbers.	
<i>Functions</i>	3
The definitions, historical evolution, and basic machinery of functions; properties of real functions of a real variable and explorations of problems involving these functions.	
<i>Equations</i>	2
The concept of <i>equation and</i> how it relates to equality, equivalence, and isomorphism, algebraic structures and solving equations, the solving process.	
<i>Geometry: Notions of congruence</i>	3
General properties of definitions, congruence from Euclid to modern times, the congruence transformations (translations, rotations, reflections, glide reflections).	
<i>Geometry: Distance and similarity</i>	2
Explorations of distance and similar figures.	
<i>Trigonometry</i>	2
Angle measure and the trigonometric ratios, the trigonometric functions and their connections, properties of the sine and cosine functions.	

Total

(Additional topics as time allows).

Further exploration into integers and polynomials, area and volume, axiomatics and Euclidean geometry.

EVALUATION*	
Homework	45%
Math history presentation	10%
Presentations	15%
to include:	
Number & Operation	
Algebra & Data analysis	
Geometry & Measurement	
Midterm examination	15%
Final examination	15%

For graduate credit, additional work will be required. This additional work will include: an extra class presentation, and additional homework problems throughout the semester (not to exceed 10% of the work assigned to the undergraduates). The additional requirements will be outlined for the graduate student at the start of the semester.