
Salisbury University Department of Mathematical Sciences
**MATH 430/531 : Mathematical Connections for Secondary School Teachers
Syllabus (Tentative)**

Description: Connection of the undergraduate mathematical curriculum to the secondary mathematics curriculum by examining high school curriculum topics from an advanced and historical perspective. Considers contributions from diverse cultures as students examine the historical development of numbers and number systems, algebra, Euclidean and non-Euclidean geometries, calculus, discrete mathematics, statistics, probability, and measurements. 4 Hours Credit: Meets four hours per week.

Prerequisites: C or better in SCED 373 and either MATH 441 or MATH 451.

Intended Audience: Secondary education majors in Mathematics.

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.

Textbooks: *Math through the Ages: A Gentle History for Teachers and Others* ISBN: 9781939512123

Topic	Weeks
Real Numbers	3
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.	
Functions	2
The definitions, historical evolution, and basic machinery of functions; properties of real functions of a real variable and explorations of problems involving these functions.	
Equations	3
The concept of equation and how it relates to equality, equivalence, and isomorphism, algebraic structures and solving equations, the solving process.	
Geometry: Notions of congruence	3
General properties of definitions, congruence from Euclid to modern times, the congruence transformations (translations, rotations, reflections, glide reflections).	
Geometry: Distance and similarity	2
Explorations of distance and similar figures.	
Trigonometry	1
Angle measure and the trigonometric ratios, the trigonometric functions and their connections, properties of the sine and cosine functions.	
Total	14

Evaluation

Projects and Presentations	30%
Homework	35%
Midterm Exam	15%
Final Exam	20%

- Graduate students will be assigned special homework/test problems or projects.
- Clear descriptions of thought processes, evidence of critical thinking, and effective communication must be

demonstrated in written work.

- **Writing Across the Curriculum:** Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors' office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**
- **NOTE:** Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.