

SYLLABUS (*Tentative*)

MATH 510 Mathematical Reasoning

Background: This course is designed for middle/secondary teachers of mathematics who wish to enhance their capabilities in mathematical reasoning and problem solving. We consider topics such as voting and apportionment systems; sets, logic and proof; applications of graph theory; recursion; descriptive statistics and combinatorics.

- Objectives:**
- To develop the ability to think mathematically,
 - To develop a variety of problem-solving strategies,
 - To gain success in solving non-routine problems, and
 - To become skillful in explaining and justifying conjectures, arguments, proofs, and problem solutions, both orally and in writing.
 - To develop units/lessons addressing K-12 learning objectives related to mathematical reasoning.

The class will focus on content as well as teaching techniques that are aligned with **NCTM** recommendations.

Intended Audience: Pre-service and in-service middle school teachers of mathematics.

Prerequisite: Approval of the department.

Texts: Excursions in Modern Mathematics 7th Edition, P. Tannenbaum, Person Prentice Hall, 2010

Technology: Excel, Graphing Calculator

	Weeks
Problem Solving and Proof	4
The Mathematics of Voting and Apportionment	3
Applications of Graph Theory	2
The Mathematics of Population Growth	2
Descriptive Statistics	1
Chance, Probability, and Odds	1
Presentations. Project presentations based on units/lessons developed, or adapted, to address middle school learning objectives	2
Total	15

EVALUATION

Assignments & Group Work & Quizzes	20%
Take-Home Mid-Term	30%
Paper	20%
Take-Home Final	30%
Total	100%