



## Department of Mathematics and Statistics

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## MATH 127 – Introduction to Mathematics for Elementary Teachers Course Syllabus

Course Description: Properties of the natural numbers, integers, rational, and real number systems, and number theory, with an emphasis on problem solving and critical thinking.

Credit Hours: 3

Course Prerequisites and Corequisites: See general course prerequisites

Course Outline: Approximate time spent

- Techniques of problem solving and estimation skills 15%  
Explicit instruction in Critical Thinking, Communication and Empirical and Quantitative Reasoning is in addition to implicit instruction, modeling and practice that occur daily in the discussion of numbers and operations. This explicit instruction includes explanation of solving mathematical problems by thinking critically, communicating logically ordered solutions with complete and correct notation, and applying empirical or quantitative skills as appropriate to the problem.  
*The following topics will be threaded throughout the course in order to develop the habits of mind necessary **to be successful** in mathematics:*
  - Introduce Polya's Problem Solving Process: Understand the Problem, Devise a Plan, Carry Out Plan, Look Back
  - Explore Basic Problem Solving Strategies
  - Explore Patterns in Language and Numbers
  - Develop Estimation Skills with Mental Arithmetic
  - Investigate temperature as a form of measurement
- Whole Numbers and Numeration: Concepts and Algorithms 25%
  - Define the Set of Whole Numbers
  - Model Whole Number Operations using a Variety of Methods
  - Verify Properties of Operations: Commutative, Associative, Distributive Property of Multiplication over Addition, Multiplication by Zero; Division Algorithm
  - Explore Place Value in Base-10 System
  - Develop and Apply Algorithms for Whole Number Operations
  - Develop Definition and Properties for Whole Number Exponents
- Number Theory: An Introduction 10%
  - Define and Explore Primes and Composites
  - Explore Basic Divisibility Properties of Sums and Products
  - Define the GCD and LCM and Use Algorithms for Finding Each
- Integers: Concepts and Algorithms 25%
  - Model Integer Operations Using A Variety Of Methods

- Investigate Extensions of Whole Number Operations and their Properties: Commutative, Associative, Distributive Property of Multiplication over Addition, Multiplication by Zero
- Real Numbers: Concepts and Algorithms 25%
  - Investigate Practical Uses for Fractions
  - Explore Connections between Fractions, Rational Numbers, Decimals, and Percents
  - Investigate Order of Numbers in Decimal Form
  - Illustrate the Pythagorean Theorem
  - Develop Proportional Thinking to Include Ratio and Proportion

Student Learning Outcomes (SLO): At the end of MTH 127, a student who has studied and learned the material should be able to:

1. Solve a variety of problems using multiple problem-solving techniques. [CO 1,3]
2. Demonstrate understanding of core concepts underlying standard and non-standard algorithmic procedures for performing operations on subsets of real numbers. [CO 1,3]
3. Communicate his/her knowledge effectively in multiple formats – verbally, concretely, and in writing. [CO 2]
4. Define, identify, and use the fundamental properties of real number operations. [CO 3]
5. Provide logical justification of mathematical thinking. [CO 1]
6. Use mathematical language and notation appropriately to communicate ideas. [CO 2]

There are no specific program learning outcomes for this major addressed in this course. It is a general education core curriculum course and/or a service course.