**Math 1350 – Foundations of Mathematics I**

**Mathematical Reasoning for Elementary School Teacher**



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**Catalog Description:**
This is designed specifically for students who seek elementary and middle school teacher certification. Topics include set theory, functions, numerations systems, number theory, emphasis on problem solving and critical thinking.

**Course Learning Outcomes:**
The student will:

* Use models and manipulatives to demonstrate the four basic operations of the rational numbers.
* Demonstrate an understanding of place value through multiple representations including the use of grouping manipulatives, place value manipulatives and abstract representations such as with exponents and different number bases.
* Demonstrate an understanding of the attributes of numeration systems.
* Analyze mathematical situations and solve problems using mathematical heuristics.

**Book Sections**

Chapter 1

1.1 An Introduction to Problem Solving

1.2 Pólya's Problem‐Solving Principles

1.3 More Problem‐Solving Strategies

1.4 Algebra as Problem‐Solving Strategy

1.5 Additional Problem‐Solving Strategies

1.6 Reasoning Mathematically

Chapter 2

2.1 Sets and Operations on Sets

2.2 Sets, Counting, and the Whole Numbers

2.3 Addition and Subtraction of Whole Numbers

2.4 Multiplication and Division of Whole Numbers

Chapter 3

3.1 Numeration Systems Past and Present

3.2 Non‐decimal Positional Systems

3.3 Algorithms for Adding and Subtracting

3.4 Algorithms for Multiplication and Division

3.5 Mental Arithmetic and Estimation

Chapter 4

4.1 Divisibility of Natural Numbers

4.2 Tests for Divisibility

4.3 Greatest Common Divisors Least Common Multiples

Chapter 5

5.1 Representations of Integers

5.2 Addition and Subtraction of Integers

5.3 Multiplication and Division of Integers

Chapter 6

6.1 Basic Concepts of Fractions and Rational Numbers

6.2 Addition and Subtraction of Fractions

6.3 Multiplication and Division of Fractions

6.4 The Rational Number System

Chapter 7

7.1 Decimals and Real Numbers

7.2 Computations with Decimals

7.3 Proportional Reasoning

7.4 Percent

Chapter 8

8.1 Algebraic Expressions, Functions, and Equations

8.2 Graphing Points, Lines, and Elementary Functions