

**Suggested Course Outline for Math 143:
Mathematics for Elementary School Teachers I**

Instructor: Peter Andreozzi

Text: Musser, Burger and Peterson, Mathematics For Elementary Teachers, Seventh Edition, Wiley, 2006.

Chapter One – Introduction to Problem Solving **2 WEEKS**

- 1.1 The Problem-Solving Process and Strategies
- 1.2 Three Additional Strategies

NOTE 1: Students should be able to distinguish between a strategy as presented in this chapter and an algorithm as presented in the following chapters.

NOTE 2: Instructors should continue the theme of problem solving throughout the course.

Chapter Two – Sets, Whole Numbers and Numeration **2 WEEKS**

- 2.1 Sets As a Basis for Whole Numbers
- 2.2 Whole Numbers and Numeration
- 2.3 The Hindu-Arabic System

Chapter Three – Whole Numbers: Operations and Properties **1.5 WEEKS**

- 3.1 Addition and Subtraction

NOTE: Students should begin to establish an understanding of the definitions of the four basic operations apart from any algorithm.

- 3.2 Multiplication and Division

NOTE 1: Special attention should be given to multiplication “as a rectangular array” since this will be helpful to provide meaning for fraction multiplication.

NOTE 2: The two models of division must be emphasized at this point to provide a basis for division of fractions in chapter 6.

- 3.3 Ordering and Exponents

Chapter Four – Whole Number Computation

- 4.1 Mental Math, Estimation, and Calculators
- 4.2 Written Algorithms for Whole-Number Operations

NOTE: Select a few from those presented in the text. Chips and base ten blocks support development of algorithms. Students should have the opportunity to work with several different types of algorithms in addition to the standard algorithms. Also, students should be able to see value in other non-standard algorithms. For example, the lattice method for addition and multiplication are presently used as the standard algorithm in some curricula and texts.

- 4.3 Algorithms in Other Bases

NOTE: You may wish to show that the Russian Peasant algorithm for multiplication creates an interesting tie to the base two numeration system.

Chapter Five – Number Theory **1.5 WEEKS**

- 5.1 Primes, Composites, and Tests for Divisibility
- 5.2 Counting Factors, Greatest Common Factor, and Least Common Multiple

NOTE: This chapter provides the instructor with the opportunity to use Venn diagrams to develop and model the GCF and LCM

Chapter Six – Fractions **2 WEEKS**

- 6.1 The Set of Fractions
- 6.2 Fractions: Addition and Subtraction
- 6.3 Fractions: Multiplication and Division

NOTE 1: The major focus of this chapter should be to model the operations with fractions, not just drill operations with fractions. Several manipulative are available including pattern blocks, fraction bars, and Cuisenaire rods. A complete and thorough coverage of this chapter is highly recommended.

NOTE 2: Since students are traditionally weak in this area, a suggestion is to distribute, prior to discussion of this chapter, the attached sheet for students to complete. Students should seek assistance from the Mathematics Learning Center as necessary.

Chapter Seven – Decimals, Ratio, Proportion, and Percent **1 WEEK**

- 7.1 Decimals
- 7.2 Operations with Decimals
- 7.3 Ratio and Proportion
- 7.4 Percent

Chapter Eight – Integers **.5 WEEK**

- 8.1 Addition and Subtraction
- 8.2 Multiplication, Division, and Order

NOTE: Student should be able to represent the four basic operations with integers with a chip model and represent them in picture form. Also, students should be made aware of the different meanings of “-“.

Chapter Nine – Rational Numbers, Real Numbers, and Algebra **.5 WEEK**

- 9.1 The Rational Numbers
- 9.2 The Real Numbers

SUB-TOTAL= 13 WEEKS

EXAMS= 1 WEEK

TOTAL= 14 WEEKS