

Math 231 Syllabus

Course: Elementary Theory of Arithmetic II

Description: Number Theory, Whole Number Operations and Properties, Estimation and Computation, Algorithms for Whole Numbers, Integer Operations and Properties, Rational Number Operations and Properties, Proportional Reasoning, Exploring Ideas of Algebra and Coordinate Geometry. Three semester hours.

Objectives:

- 1) Learn to use words, symbols, and techniques of mathematics with precision so as to communicate concepts and ideas correctly and clearly.
- 2) Experience the satisfaction of mathematical discovery which stimulates curiosity, initiative, confidence, and interest in mathematics.
- 3) Develop patterns of reasoning which enable one to investigate unfamiliar situations.
- 4) Develop understanding and appreciation of the structure of the number system, elementary number theory, and the use of algebra and geometry.
- 5) Develop an ability to organize mathematical experiences as a means of discovery rather than presentations of a fixed set of facts and procedures

Text: O'Daffer, Charles, Cooney, Dossey and Schielack, Mathematics for Elementary School Teachers, Third Edition, Addison Wesley, 2002.

Course Outline:

- Chapter 1. Mathematical Processes: Sections 1 -3
Communicating and reasoning mathematically; Mathematics as problem solving
- Chapter 2: Sets and Whole-Number Operations and Properties: Sections 1-3
Sets and Whole Numbers; Addition and Subtraction of Whole Numbers;
Multiplication and Division of Whole Numbers.
- Chapter 3: Estimation and Computation: Section 1-4
Strategies and Procedures for Mental Computation;
Strategies and Procedures for Estimation;

Algorithms for Addition and Subtraction;
Algorithms for Multiplication and Division.

- Chapter 4: Number Theory: Sections 1-2
Divisibility; Prime and composite numbers; Greatest common divisor and least common multiple.
- Chapter 5: Understanding Integer Operations and Properties: Sections 1-2
Addition, Subtraction and Order Properties of Integers; Multiplication, Division and Other Properties of Integers.
- Chapter 6: Rational Number Operations and Properties: Sections 1-4
Rational Number Ideas and Symbols;
Adding and Subtracting Rational Numbers;
Multiplying Rational Numbers; Dividing, Comparing, and Ordering Rational Numbers.
- Chapter 7: Proportional Reasoning: Sections 1-3
The Concept of Ratio; Proportional Variation and Solving Proportions; Solving Percent Problems.
- Chapter 13: Exploring Ideas of Algebra and Coordinate Geometry: Sections 1-4
Variables, Expressions and Equations; Solving Equations;
Exploring Graphs of Linear Equations; Connecting Algebra and Geometry.

Grading:

test . . . 100 Pts
daily . . . 150 Pts.
portfolio. . . 100 Pts.

Total: 350 points

Grading scale: "10 pt. scale"

315 - 350: A
280 - 314: B