MATH 168: MATHEMATICS FOR ELEMENTARY TEACHERS I

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2024
Credits:	5
Total Contact Hours:	90
Lecture Hours :	90
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	180
Total Student Learning Hours:	270
Prerequisite:	Intermediate algebra or higher, or direct placement based on multiple measures.
District General Education:	A3. Mathematics
Transferable to CSU:	Yes
Transferable to UC:	Yes - Approved
Grading Method:	Standard Letter

Catalog Course Description

Course is designed for prospective elementary teachers. The course covers problem solving, logic and sets, number systems and operations, number theory and algebraic reasoning. Techniques in instructional delivery explored. 90 lecture hours.

Course Objectives

- Apply Polya's problem-solving principles and utilize various problem-solving strategies to solve applications and to explain the results
- Recognize and represent patterns in a variety of forms, such as tables, graphs, verbal and symbolic rules
- Use the terminology and concepts of logic to apply elementary set theory for describing and comparing data and to use Venn diagrams as a problem-solving tool
- Represent numbers using different numeration systems and number-bases as a means to understand the Base-Ten system
- Apply number theory concepts for computational algorithms and solving applications
- Explain and apply models and computational algorithms for addition, subtraction, multiplication and division and understand their relationship to the properties of number systems
- Demonstrate mental math techniques and estimate the results of computations
- Use proportional reasoning such as ratios and equivalent fractions to solve numerical and algebraic problems
- Formulate and solve applied problems using whole numbers, integers, fractions, decimals, percents and real numbers by applying recognized problem-solving processes

Major Course Content

1. **An Introduction to Problem Solving**
   a. Mathematics and Problem Solving
   b. Explorations with Patterns
2. **Introduction to Logic and Sets**
   a. Reasoning and Logic: An Introduction
   b. Describing Sets
   c. Other Set Operations
3. **Numeration Systems and Whole Number Operations**
   a. Numeration Systems
   b. Addition of Whole Numbers
   c. Subtraction of Whole Numbers
   d. Multiplication of Whole Numbers
   e. Division of Whole Numbers
4. **Number Theory**
   a. Divisibility
   b. Prime and Composite Numbers
   c. Greatest Common Divisor and Least Common Multiple
5. **Integers**
   a. Addition and Subtraction of Integers
   b. Multiplication and Division of Integers
6. **Rational Numbers and Proportional Reasoning**
   a. The Set of Rational Numbers
   b. Addition, Subtraction, and Estimation with Rational Numbers
   c. Multiplication, Division, and Estimation with Rational Numbers
   d. Proportional Reasoning
7. **Decimals, Percents, and Real Numbers**
   a. Terminating Decimals
   b. Operations on Decimals
   c. Repeating Decimals
   d. Percents
   e. Real Numbers
8. **Algebraic Thinking**
   a. Variables
   b. Equations

Examples of Required Writing Assignments

Example project: Observe math classes at the elementary level and write a report for class.

Examples of Outside Assignments

For the basic operations with whole numbers, a student should understand a variety of algorithms and be able to explain and demonstrate them with examples.

Instruction Type(s)

Lecture, Online Education Lecture