

C-ID Descriptor

Mathematical Concepts for Elementary School Teachers - Number Systems

Descriptor Details

- **Descriptor Title:** Mathematical Concepts for Elementary School Teachers - Number Systems
- **C-ID Number:** 120
- **Units:** 3.0
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General Description

This course focuses on the development of quantitative reasoning skills through in-depth, integrated explorations of topics in mathematics, including real number systems and subsystems. Emphasis is on comprehension and analysis of mathematical concepts and applications of logical reasoning.

Prerequisites

Completion of two years of high school algebra and appropriate placement score or completion of course in Intermediate Algebra with a grade of C or better.

Corequisites

No information provided

Advisories

No information provided

Content

1. Numeration systems: history, Hindu-Arabic numeration system, and place value systems;
2. Integers: structure and basic properties, computational algorithms;
3. Basic number theory: divisibility, prime and composite numbers, prime factorization, fundamental theorem of arithmetic, least common multiple and greatest common divisor;
4. Rational numbers: structure and properties, ratio and proportion;
5. Real numbers: structure and basic properties, arithmetic operations, rational and irrational numbers, decimal representation, number line representation;
6. Patterns, problem solving, communication, connections, modeling, reasoning, and representation; and
7. National and state curriculum standards for elementary school math including Common Core State Standards.

Lab Activities

No information provided

Objectives

Upon successful completion of the course, students will be able to:

1. Perform calculations with place value systems;
2. Evaluate the equivalence of numeric algorithms and explain the advantages and disadvantages of equivalent algorithms in different circumstances;
3. Apply algorithms from number theory to determine divisibility in a variety of settings;
4. Analyze least common multiples and greatest common divisors and their role in standard algorithms;
5. Explain the concept of rational numbers, using both ratio and decimal representations; analyze the arithmetic algorithms for these two representations; and justify their equivalence;
6. Analyze the structure and properties of whole, rational, and real number systems; define the concept of rational and irrational numbers, including their decimal representation; and illustrate the use of a number line representation;
7. Develop and reinforce conceptual understanding of mathematical topics through the use of patterns, problem solving, communication, connections, modeling, reasoning, and representation; and
8. Develop activities implementing curriculum standards.

Evaluation Methods

Tests, examinations, homework or projects where students demonstrate their mastery of the learning objectives and their ability to devise, organize and present complete solutions to problems.

Textbooks

A college level textbook designed for prospective elementary school teachers and supporting the learning objectives of this course.