

Course Outline for MATH 3481, Mathematics for Elementary Teaching I

MATH 3481 Mathematics for Elementary Teaching I (4 units)

Prerequisite: Liberal Studies major; junior standing, LS 230, or [LS 2230](#); and completion of GE Area 2.

Introduction to reasoning about quantities, numeration, number sense, meaning of rational numbers, and operations on whole numbers, fractions and decimals. Algebraic reasoning related to early elementary mathematics including operations. 4 lectures.

Course Learning Objectives	
1	Use strategies to solve problems related to elementary and middle school mathematics.
2	Use multiple representations and algorithms to write and solve problems involving fundamental relations (greater than, less than, equal to) and operations (addition, subtraction, multiplication, and division) on whole numbers and integers.
3	Represent rational numbers as fractions, repeating and terminating decimals; and use the multiple forms of a rational number to solve problems.
4	Articulate the role of place-value in addition, subtraction, multiplication and division.
5	Represent numbers, count, and perform operations in other bases (e.g. base-3 and base-5).
6	Analyze word problems, including recognizing quantities, using pictures and strip diagrams as solution methods and making sense of solutions.
7	Describe factors and multiples of given numbers as well as find and operate with prime factorizations.

Expanded Course Content

Textbooks, materials, and/or other resources
Beckmann, S. Mathematics for Elementary and Middle School Teachers with Activities. 6th Edition, Pearson.

Week	Readings	Topics of Discussion
1	Pages 1 - 8, Section 9.4	Reasoning about quantities in word problems including using pictures and strip diagrams for solution.

Week	Readings	Topics of Discussion
2	Pages 1 - 8, Section 9.4	Reasoning about quantities in word problems including using pictures and strip diagrams for solution (continued).
3	Pages 1 - 8	Mental math and using mental math to make sense of solutions.
4	Chapter 1	Other numerations systems (e.g., Egyptian, Babylonian, Mayan and Roman) and place-value in base-10.
5	None	Developing number sense in other bases, including counting and converting between other bases and base-10.
6	Sections 8.1, 8.2, 8.4	Factors, multiples and prime factorizations.
7	Sections 2.1, 2.2, 2.3	Meaning of rational numbers, visual representations of fractions, equivalent fractions and comparing fractions.
8	Sections 2.1, 2.2, 2.3	Meaning of rational numbers, visual representations of fractions, equivalent fractions and comparing fractions.
9	Instructor's notes	Converting fractions to decimals and decimals to fractions.
10	Chapter 3	Addition and subtraction including properties, operating on whole numbers, operating on fractions and analyzing algorithms.
11	Chapter 4	Multiplication including properties and operating on whole numbers.
12	Chapter 5	Multiplication of fractions, decimals and negative numbers
13	Chapter 6	Division including properties, interpretations of division. Division algorithms and fraction division.
14	Instructor's notes	Algebraic reasoning related to early elementary mathematics, specifically operations and problem types.
15	Instructor's notes	Algebraic reasoning related to early elementary mathematics, specifically operations and problem types (continued).

Method of Assessment

The possible methods of assessment are written individual examinations, quizzes, in-class worksheets or presentations, projects, and homework. One or more midterms and a cumulative final exam are required.

Instructional Mode

The instructional mode for this class is face-to-face. This designation means that the essential academic standards of the course require in-class student engagement, and thus remote instruction is not appropriate.