

Mathematics 1341

Mathematics for Elementary/Middle School Teachers I

Student Learning Outcomes

- 1. Students will gain factual knowledge including the mathematical terminology, classifications, and methods used in this course.** Students will use the vocabulary, symbolism, structure, reasoning, and procedures that are needed to teach the mathematical content for grades K-8+. See course content for more details.
- 2. Students will learn the fundamental principles, generalizations, and theories covered in this course.** Students will identify and apply properties of the real number system, algebraic thinking, patterning, the fundamental theorem of arithmetic, and both standard and non-standard arithmetic algorithms.
- 3. Students will learn to apply course material to improve thinking, problem solving, and decisions.** Students will be able to make connections between concepts and also apply knowledge in new and different settings. In particular, students will learn how to translate course content into K-8 grade-appropriate lessons.
- 4. Students will develop specific skills, competencies, and points of view needed by K-8 mathematics teachers.** Besides learning the mathematical content of this course, student will:
 - become familiar with the Texas Essential Knowledge and Skills (TEKS) and the National Council of Teachers of Mathematics (NCTM) Standards;
 - understand different learning styles and learn multiple approaches to the teaching of mathematics;
 - use manipulatives to model mathematical concepts;
 - develop communication skills (oral, written, and listening), knowledge of appropriate vocabulary, and various questioning strategies;
 - learn appropriate calculator activities;
 - learn how to use resources (such as the Internet and NCTM journals) in planning classroom activities.
- 5. Students will gain a broader understanding and appreciation for mathematics.**

Course Content

Textbook: *Mathematics for Teachers: An Interactive Approach for Grades K-8*, Fourth Edition, by Thomas Sonnabend. The following chapters are covered:

- 1. Mathematical Reasoning.** inductive and deductive reasoning; patterns; problem solving.
- 2. Sets and Functions.** sets; operations on two sets; functions and relations.
- 3. Whole Numbers.** numeration systems; addition, subtraction, multiplication, and division of whole numbers; properties, algorithms, mental computation, and estimation of whole numbers; place value and algorithms in other bases.
- 4. Number Theory.** factors; divisibility; prime and composite numbers; common factors and multiples.
- 5. Integers.** Addition, subtraction, multiplication, and division of integers; properties of integer operations.
- 6. Rational Numbers as Fractions.** Rational numbers; addition, subtraction, multiplication, and division of rational numbers; properties, estimation, and error patterns with rational numbers.
- 7. Decimals, Percents, and Real Numbers.** Place value, estimation, and mental computation; decimal arithmetic and error patterns; rational, irrational, and real numbers. (The rest of this chapter is covered in Math 1342.)