**1. COURSE TITLE\*:** Math for the Elementary Teacher I

**2. CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*:** MATH 2237

**3. PREREQUISITE\*:** One of the following:

* Math 118 or Math 1118
* Three years of college preparatory math with a grade of C or

above.

**4. Course Time Location (Course Syllabus – Individual Instructor Specific)**

**5. CREDIT HOURS\*:** 4 **LECTURE HOURS\*:** 4

**LABORATORY HOURS\*:** 0 **OBSERVATION HOURS\*:** 0

**6. FACULTY CONTACT INFORMATION: (Course Syllabus – Individual Instructor Specific)**

**7. COURSE DESCRIPTION\*:**

This course includes math topics that are fundamental to elementary education. Topics include a review of problem solving, set theory, numeration systems, whole numbers, decimals, fractions, signed numbers, and the basic binary operations, with an emphasis on the use of manipulatives and visual representations to teach elementary mathematics.

**8. LEARNING OUTCOMES\*:**

At the completion of this course the student will be able to:

1. Use and interpret appropriate language and symbols for mathematics.
2. Interpret and solve problems using appropriate problem-solving techniques and models.
3. Use manipulatives, pictures, diagrams, and games to explain mathematical concepts.
4. Demonstrate a knowledge of the mathematics standards for the elementary curriculum.
5. Demonstrate an understanding of real numbers and their properties
6. Demonstrate an understanding of the four fundamental operations of arithmetic and their properties.
7. Demonstrate an understanding of algorithms used for the four fundamental operations on whole numbers.
8. Interpret the language and symbols of set theory and use set theory in problem solving.
9. Demonstrate an understanding of other number systems and how these can be used in the classroom.
10. Demonstrate competency in the major elements of number theory.
11. Demonstrate competency in fractions and operations involving fractions.
12. Make appropriate use of estimation as an exercise in number sense.
13. Demonstrate an understanding of the concepts, properties, and algorithms associated with the rational number forms.
14. Demonstrate an understanding of ratio, proportion, percent, and the use of these concepts in problem solving.
15. Exhibit an understanding of equations, properties of equality, and translate word problems into variables and equations.
16. Demonstrate an understanding of the function concept and its various representations.
17. Demonstrate an understanding of the Cartesian coordinate system

**9. ADOPTED TEXT(S):**

*A Problem Solving Approach to Mathematics for Elementary School Teachers*

13th edition

Rick Billstein, Barbara Boschmans, Shlomo Libeskind, and Johnny W. Lott

Pearson 2020.

ISBN (loose-leaf): 9780135184172

ISBN (eText): 9780136880141

**10. OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.) \*\***

A calculator that can perform basic arithmetic operations is required.

**11. GRADING\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

 A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: Below 60

**12.** **GRADING PROCEDURES OR ASSESSMENTS: *(Course Syllabus – Individual Instructor Specific)***

* 70% - 80% of the student’s grade should be based on assessments (homework, quizzes, or tests) that cover the mathematical content from the K-8 Common Core standards.
* 20% - 30% of the student’s grade should be based on projects, papers, and/or presentations.

**EXAMPLES BELOW:**

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| --- |
| *Example 1 - By Percent* |
|  Homework 10% Quizzes/Tests 65% Project 15% Presentation 10% Total 100% |

|  |
| --- |
| *Example 2*  |
| *Category* | *By Total Points* | *% of Grade* |
| Homework (20x10) | 200 | 10% |
| Quizzes/Tests (5x360) | 1800 | 90% |
| Total | 2000 | 100% |

|  |
| --- |
| *Example 3* |
| *Category* | *By Total Points* | *% of Grade* |
| Online Quizzes | 400 | 10% |
| Online Tests (6x100) | 600 | 15% |
| Notebook (2x500) | 1000 | 25% |
| Midterm | 1000 | 25% |
| Final | 1000 | 25% |
| Total | 4000 | 100% |

**13. COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

The course design provides instruction and materials to support the course objectives. Classes may consist of a variety of means to accomplish this including but not limiting to: lectures, class discussions, small group projects, supplemental materials, and outside assignments. Practice is an important part of the learning process. For every one hour of class time, two additional hours of study time should be expected.

**14. COURSE OUTLINE:** ***(Course Syllabus – Individual Instructor Specific)***

 Chapter 1: An Introduction to Problem Solving

 1.1 Mathematics and Problem Solving (obj. 2, 4)

 1.2 Explorations with Patterns (obj. 2)

Chapter 2: Introduction to Logic and Sets

 2.1 Reasoning and Logic: An Introduction (obj. 1)

 2.2 Describing Sets (obj. 8)

 2.3 Other Set Operations (obj. 8)

 Chapter 3: Numeration Systems and Whole Number Operations

 3.1 Numeration Systems (obj. 9)

 3.2 Addition of Whole Numbers (obj. 3, 6, 7)

 3.3 Subtraction of Whole Numbers (obj. 3, 6, 7)

 3.4 Multiplication of Whole Numbers (obj. 3, 6, 7)

 3.5 Division of Whole Numbers (obj. 3, 6, 7)

 Chapter 4: Number Theory

 4.1 Divisibility (obj. 10)

 4.2 Prime and Composite Numbers (obj. 10)

 4.3 Greatest Common Divisor and Least Common Multiple (obj. 10)

Chapter 5: Integers

 5.1 Addition and Subtraction of Integers (obj. 6)

 5.2 Multiplication and Division of Integers (obj. 6)

 Chapter 6: Rational Numbers and Proportional Reasoning

 6.1 The Set of Rational Numbers (obj. 11)

 6.2 Addition, Subtraction, and Estimation with Rational Numbers

(obj. 12, 13)

 6.3 Multiplication, Division, and Estimation with Rational Numbers

(obj. 12, 13)

 6.4 Proportional Reasoning (obj. 14)

 Chapter 7: Decimals, Percents, and Real Numbers

 7.1 Terminating Decimals (obj. 13)

 7.2 Operations on Decimals (obj. 6)

 7.3 Repeating Decimals (obj. 13)

 7.4 Percents (obj. 14)

 7.5 Real Numbers (obj. 5)

Chapter 8: Algebraic Thinking

 8.1 Variables (obj. 15)

 8.2 Equals Relation and Equations (obj. 15)

 8.3 Functions (obj. 16)

 8.4 Equations in a Cartesian Coordinate System (obj. 17)

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

 Students are expected to complete projects and demonstrations that directly relate to teaching mathematics in elementary schools.

 Proposed timeline for meeting the course objectives.

 Week 1: Chapter 1

Week 2: Chapter 2

 Week 3: Chapter 2

 Week 4: Chapter 3

 Week 5: Chapter 3

 Week 6: Chapter 3

 Week 7: Chapter 4

 Week 8: Chapter 4

 Week 9: Chapter 5

 Week 10: Chapter 6

 Week 11: Chapter 6

 Week 12: Chapter 7

 Week 13: Chapter 7

 Week 14: Chapter 8

 Week 15: Chapter 8

 Week 16: Finals

**16.** **FERPA:\***

Students need to understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17. DISABILITIES:\***

Students with disabilities may contact the Disability Services Office, Central Campus, at 800-628-7722 or 937-393-3431.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.