OFFICIAL SYLLABUS
MATH 112a – Math for Elementary Teaching: Number Sense and Algebra
(Adopted – Spring 2017; Committee: C. Eames, T. Voepel)

Chapter 1. Numbers and the Base-Ten System
1.1 The Counting Numbers
1.2 Decimals and Negative Numbers
1.3 Reasoning to Compare Numbers in Base Ten
1.4 Reasoning about Rounding

Chapter 2. Fractions and Problem Solving
2.1 Solving Problems and Explaining Solutions
2.2 Defining and Reasoning about Fractions
2.3 Reasoning about Equivalent Fractions
2.4 Reasoning to Compare Fractions
2.5 Reasoning about Percent

Chapter 3. Addition and Subtraction
3.1 Interpretations of Addition and Subtraction
3.2 The Commutative and Associative Properties of Addition, Mental Math, and Single-Digit Facts
3.3 Why the Standard Algorithms for Addition and Subtraction in Base Ten Work
3.4 Reasoning about Fraction Addition and Subtraction
3.5 Why We Add and Subtract with Negative Numbers the Way We Do

Chapter 4. Multiplication
4.1 Interpretations of Multiplication
4.2 Why Multiplying by 10 is Special in Base Ten
4.3 The Commutative and Associative Properties of Multiplication, Areas of Rectangles, and Volumes of Boxes
4.4 The Distributive Property
4.5 Properties of Arithmetic, Mental Math, and Single-Digit Multiplication Facts
4.6 Why the Standard Algorithm for Multiplying Whole Numbers Works

Chapter 5. Multiplication of Fractions, Decimals, and Negative Numbers
5.1 Making Sense of Fraction Multiplication
5.2 Making Sense of Decimal Multiplication
5.3 Extending Multiplication to Negative Numbers

Chapter 6. Division
6.1 Interpretations of Division
6.2 Division and Fractions and Division with Remainder
6.3 Why Division Algorithms Work
6.4 Fraction Division from the How-Many-Groups Perspective
6.5 Fraction Division from the How-Many-Units-in-1-Group Perspective
6.6 Dividing Decimals

Chapter 7. Ratio and Proportional Relationships
7.1 Motivating and Defining Ratio and Proportional Relationships
7.2 Solving Proportion Problems by Reasoning with Multiplication and Division
7.3 The Values of a Ratio: Unit Rates and Multipliers
7.4 Proportional Relationships
7.5 Proportional Relationships Versus Inversely Proportional Relationships

Chapter 8. Number Theory
8.1 Factors and Multipliers
8.3 Divisibility Tests
8.4 Prime Numbers
8.5 Greatest Common Factor and Least Common Multiple
8.6 Rational and Irrational Numbers

Chapter 9. Algebra
9.1 Numerical Expressions
9.2 Expressions with Variables
9.3 Equations
9.4 Solving Algebra Word Problems with Strip Diagrams and with Algebra

Any instructor should cover all of the material specified.