SYLLABUS
PART I
EDISON STATE COMMUNITY COLLEGE
MTH 126S   MATHEMATICAL FOUNDATIONS I
4 CREDIT HOURS

COURSE DESCRIPTION
First of a two course sequence designed for elementary education majors. Topics covered include numbers and operations, algebraic thinking and number theory. Prerequisite: satisfactory math assessment score and high school Algebra I, Geometry and Algebra II or a grade of "C" or better in MTH 099D.

COURSE GOALS

The student will:

Bloom's Level		Gen Ed Outcomes
2	1. Discuss the intricacies of learning to count, including the distinction between counting as a list of numbers in order and counting to determine a number of objects, and use pairings between elements of two sets to establish equality or inequalities of cardinalities.	1,2,3,4,5,6
1	2. Label units (e.g. apples, cups, inches, etc.) while solving problems and explaining solutions.	1,2,3,5,6
2	3. Discuss how the base-ten place value system (including extending to decimals) relies on repeated bundling in groups of ten and how to use objects, drawings, layered place value cards, base-ten blocks, and numerical expressions (including integer exponents) to help reveal base-ten structure.	1,2,3,4,5,6
3	4. Use the Common Core State Standards development of fractions as follows: start with a whole, understand the fraction 1/b as one piece when the whole is divided into b equal pieces; understand the fraction a/b as a piece of size 1/b and that the fraction a/b may be larger than one; understand fractions as numbers that can be represented in a variety of ways; such as with lengths, areas, and sets; use the meaning of fractions to explain when two fractions are equivalent.	1,2,3,4,5,6
4	5. Illustrate positive versus negative numbers on the number line and in real-world contexts.	1,2,3,4,5,6
5	6. Justify the comparison (=,<,>) of numbers across different representations, such as fractions, decimals, mixed numbers, etc.	1,2,3,5,6
3	7. Demonstrate the skill of calculating simple arithmetic problems without the use of a calculator.	1,2,3,5,6
4	8. Analyze addition, subtraction, multiplication, and division as descriptions of certain types of reasoning and correctly use the language and notation of these operations.	1,2,3,5,6
4	9. Illustrate how different problems are solved by addition, subtraction multiplication and division and be able to explain how the operation used is connected to the solving of the problem.	1,2,3,5,6
4	10. Recognize and explain that addition, subtraction, multiplication, and division problem types and associated meanings for the operations extend from whole numbers to fractions and decimals.	1,2,3,5,6
4	11. Correlate teaching/learning paths for single-digit addition and associated subtraction and single-digit multiplication and associated division,	1,2,3,4,5,6

	including the use of properties of operations.	
4	12. Compare and contrast standard algorithms for operations and multi-digit whole numbers that rely on the use of place value units with mental math methods students generate.	1,2,3,4,5,6
4	13. Use math drawings and manipulative materials to reveal, discuss, and explain the rationale behind computation methods.	1,2,3,5,6
2	14. Extend algorithms and mental math methods to decimal arithmetic.	1,2,3,5,6
4	15. Illustrate different representations of the same fraction to explain procedures for adding, subtracting, multiplying, and dividing fractions.	1,2,3,5,6
5	16. Explain the connection between fractions and division, and how fractions, ratios, and rates are connected via unit rates.	1,2,3,4,5,6
5	17. Explain why the extensions of the operations to signed numbers make sense.	1,2,3,4,5,6
5	18. Evaluate quantities and the relationships between quantities using a variety of representations.	1,2,3,4,5,6
5	19. Discuss the foundations of algebra in elementary mathematics, including understanding the equal sign as means "is the same amount as" rather than a "calculate the answer" symbol.	1,2,3,4,5,6
2	20. Identify repeated reasoning, describe the regularity in words, and represent it using diagrams and symbols and communicate the connections among these.	1,2,3,4,5,6
5	21. Articulate, justify, identify, and use properties of operations.	1,2,3,5,6
2	22. Describe numerical and algebraic expressions in words, parsing them into their component parts, and interpreting the components in terms of a context.	1,2,3,4,5,6
5	23. Devise a variety of methods to solve equations that arise in real-world contexts.	1,2,3,4,5,6
3	24. Demonstrate knowledge of prime and composite numbers, divisibility rules, least common multiple, greatest common factor, and the uniqueness of prime factorization.	1,2,3,4,5,6
5	25. Validate decimal representation and recognize that there are numbers beyond integers and rational numbers.	1,2,3,4,5,6

CORE VALUES
The Core Values are a set of principles that guide in creating educational programs and environments at Edison State. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will incorporate and reinforce these Core Values frequently.

TOPIC OUTLINE
 1. Numbers and Operations
 2. Set Theory
 3. Algebraic Thinking
 4. Mental Math
 5. Number Theory
 6. Whole Numbers
 7. Integers
 8. Rational and Irrational Numbers
 9. Decimals and Real Numbers