

Math 215 Course Content and Objectives

COURSE CONTENT AND SCOPE - Lecture: Outline the topics included in the lecture portion of the course (<i>Outline reflects course description, all topics covered in class</i>).	Hours Per Topic	COURSE OBJECTIVES - Lecture: Upon successful completion of this course, the student will be able to... (<i>Use action verbs - see Bloom's Taxonomy for 'action verbs requiring cognitive outcomes.'</i>)
Communication, connections, and modeling. Introduction to problem solving.	6	Develop and reinforce conceptual understanding of mathematical topics through the use of patterns, problem solving, communication, connections, modeling, reasoning, and representation. Find patterns, examine a simpler case, make a table or diagram, work backward, and try direct reasoning to solve mathematical problems. Identify whether a sequence is arithmetic or geometric. Construct Euler diagrams and truth tables. Determine whether statements are valid or logically equivalent.
Numeration systems and sets.	6	Perform calculations with place value systems; evaluate the equivalence of numeric algorithms and explain the advantages and disadvantages of equivalent algorithms in different circumstances. Write numbers using the Hindu-Arabic, Babylonian, Egyptian, Roman, and Mayan numeration systems. Convert numbers from one base system to another. Write sets using set-builder notation. Use set notation to compare sets and indicate elements of sets. Use Venn diagrams to solve mathematical problems.
Whole numbers and their operations.	6	Add, subtract, multiply, and divide whole numbers.
Algebraic thinking.	6	Use variables to represent quantities, translate phrases into mathematical expressions, and solve equations. Define and graph functions. Perform operations on functions.
Integers: structure and basic properties, computational algorithms. Basic number theory: divisibility, fundamental theorem of arithmetic.	6	Add, subtract, multiply, and divide integers. Find the prime factorization of a number. Apply algorithms from number theory to determine divisibility in a variety of settings. Find the least common multiple (LCM) and greatest common divisor (GCD) of a set of numbers. Analyze least common multiples and greatest common divisors and their role in standard algorithms. Perform clock and modular arithmetic.

Rational numbers: structure and properties, fractions.	6	Add, subtract, multiply, and divide rational numbers; explain the concept of rational numbers, using both ratio and decimal representations; analyze the arithmetic algorithms for these two representations, and justify their equivalence.
Decimals. Real numbers: structure and basic properties, number line representation.	6	Convert numbers from fractions to decimals and vice versa. Add, subtract, multiply, and divide decimals. Determine whether a real number is rational or irrational. Analyze the structure and properties of whole, rational, and real number systems; define the concept of rational and irrational numbers, including their decimal representation, and illustrate the use of a number line representation.
Proportional reasoning, percents, and applications.	6	Use proportions to solve mathematical equations. Calculate percents and compute interest.
National and state curriculum standards for elementary school math, including Common Core State Standards.	4	Develop activities implementing curriculum standards.
Final examination.	2	Final examination.
Total:	54	
Total Lecture Hours In Section I Class Hours:	54	