

**MAT 075 MATHEMATICAL LITERACY (4 credit hours)**

Official Course Description	Develops the mathematical thinking skills and understanding needed for non-math and non-science majors, in a one-semester course integrating numeracy, proportional reasoning, algebraic reasoning, and functions. Provides an alternate path to college-level math courses other than college algebra.
Prerequisites	MAT 055 or equivalent as determined by KCTCS placement examination.
Delivery Mode	In-Person and Online
Components	Lecture: 4.0 credits (60 contact hours)
Implementation	n/a
Attributes	Remedial - Mathematics
Advising Note	None

**OFFICIAL COURSE COMPETENCIES/OBJECTIVES**

Upon completion of this course, the student can:

1. Apply the concepts of numeracy, including fractions, decimal numbers, percents, exponents, square roots and order of operations in multiple contexts.
2. Recognize proportional relationships and use proportional reasoning to solve problems.
3. Use the language of algebra to write relationships involving variables, interpret those relationships, and solve problems involving those relationships expressed as linear and quadratic models and geometric formulas.
4. Interpret and move flexibly between multiple formats for linear functions, quadratic functions, and linear systems including graphs, tables, equations, and words.
5. Demonstrate student success skills including perseverance, time management, and appropriate use of resources.
6. Develop the ability to think critically and solve problems in a variety of contexts using the tools of mathematics including technology.

**OFFICIAL COURSE OUTLINE**

- I. Numeracy
  - A. Operation sense and the effects of common operations on numbers in words and symbols
  - B. Competency in the application of place values, fractions, decimal numbers, percents, exponents, square roots and numbers written in scientific notation
  - C. Use of estimation skills
  - D. Application of quantitative reasoning to solve problems involving quantities or rates
  - E. Measurement sense and use of geometric formulas
  - F. Mathematical properties and uses of different types (tables, graphs, algebraic representations) of mathematical summaries of data
  - G. Interpretation based on presentation of data from line graphs, bar graphs and charts
- II. Proportional Reasoning
  - A. Recognition of proportional relationships from verbal and numeric representations
  - B. Comparison of proportional relationships represented in different ways
  - C. Application of quantitative reasoning strategies to solve real-world problems with proportional relationships
- III. Algebraic Reasoning
  - A. Use of variables to represent quantities or attributes
  - B. Simplification of polynomials using arithmetic operations and factoring
  - C. Effect of changes in variable values in an algebraic relationship
  - D. Construction and solution of linear equations or inequalities and quadratic equations to represent relationships involving one or more unknown or variable quantities
  - E. Simplification of algebraic roots and integer and rational exponents in solving problems
- IV. Functions
  - A. Translation of problems from a variety of contexts into mathematical representation and vice versa

- B. Description of the behavior of common types of linear and quadratic functions using words, algebraic symbols, graphs, and tables
  - C. Assessment of the reasonableness of a linear model for given data and consideration of alternative models
  - D. Important characteristics (domain, shape, intercepts, maximum/minimum) of functions in various representations
  - E. Determination and interpretation of the rate of change of a linear function using graphs, tables, equations, and words
  - F. Graphical representation of linear equations or inequalities and quadratic equations
  - G. Solution of linear systems in two variables and applied linear system problems
  - H. Sources of inexactness and error in using mathematical models to characterize real-world scenarios or physical relationships
- V. Student Success
- A. Use of written and verbal skills in relation to course content
  - B. Evaluation of success strategies that address personal learning style, strengths, and weaknesses
  - C. Use of print and online resources to conduct research
  - D. Time management and goal setting techniques
- VI. Mathematical Success
- A. Use of mathematical skills in diverse scenarios and contexts
  - B. Use of appropriate technology
  - C. Critical thinking in analyzing ideas, patterns and principles
  - D. Flexibility with mathematics through various contexts, modes of technology, and presentations of information (tables, graphs, words, equations)
  - E. Skills needed in studying for and taking tests