

**MAT 150 COLLEGE ALGEBRA** (3 credit hours)[KCTCS Course Information](#)

Official Course Description	<p>Includes selected topics in algebra and analytic geometry. Develops manipulative skills and concepts required for further study in mathematics. Includes linear, quadratic, polynomial, rational, exponential, logarithmic and piecewise functions; systems of equations; and an introduction to analytic geometry. (Students may not receive credit for both MAT150 and any other College Algebra or Pre-calculus course. Credit not available on the basis of special exam.)</p> <p>Prerequisites: One of the following:</p> <ol style="list-style-type: none"> <li>1. Math ACT score of 22 or above;</li> <li>2. Math ACT score of 19 – 21 with concurrent MAT 100 workshop;</li> <li>3. Successful completion of Intermediate Algebra, MAT 126, or equivalent; or</li> <li>4. KCTCS placement exam recommendation.</li> </ol>
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**OFFICIAL COURSE COMPETENCIES/OBJECTIVES**

Upon completion of this course, the student can:

1. Recognize functions and specify the domain and the range of a given function.
2. Graph linear, quadratic, polynomial, rational, exponential, logarithmic and piecewise functions.
3. Write expressions from data, verbal descriptions or graph.
4. Solve polynomial, rational, exponential and logarithmic equations.
5. Solve application problems using linear, quadratic, exponential, and logarithmic functions.
6. Perform operations with functions and find inverse functions.
7. Solve linear and nonlinear systems of equations.
8. Solve nonlinear inequalities

**OFFICAL COURSE OUTLINE**

- I. Functions
  - A. Functions, relations, domain, and range
  - B. Properties of functions
  - C. Operations with functions
  - D. Inverse functions
- II. Graphs and Applications
  - A. Linear functions
  - B. Quadratic functions
  - C. Exponential functions
  - D. Logarithmic functions
  - E. Polynomial functions
  - F. Rational Functions
  - G. Piecewise-defined functions
- III. Equations and Inequalities
  - A. Polynomial equations
  - B. Rational equations
  - C. Exponential equations
  - D. Logarithmic equations
  - E. Nonlinear inequalities
  - F. Systems of linear equations
  - G. Systems of nonlinear equations

## GENERAL EDUCATION COMPETENCIES

- A. Knowledge of human cultures and the physical and natural worlds through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts.
- B. Intellectual and practical skills, including
  - inquiry and analysis
  - critical and creative thinking
  - written and oral communication
  - quantitative literacy
  - information literacy
  - teamwork and problem solving
- C. Personal and social responsibility, including
  - civic knowledge and engagement (local and global)
  - intercultural knowledge and competence
  - ethical reasoning and action
  - foundations and skills for lifelong learning
- D. Integrative and applied learning, including synthesis and advanced accomplishment across general and specialized skills.

## STUDENT LEARNING OUTCOMES FOR QUANTITATIVE REASONING (Approved Fall 2017)

In MAT 150, students will learn to:

1. Interpret information presented in mathematical and/or statistical forms by (Gen Ed Comp B):
  - Recognizing functions and specify the domain and the range of a given function
2. Illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically by (Gen Ed Comp A, B, C):
  - Graphing linear, quadratic, polynomial, rational, exponential, logarithmic and piecewise functions
3. Determine when computations are needed and execute the appropriate computations by (Gen Ed Comp A, B):
  - Solving polynomial, rational, exponential and logarithmic equations.
  - Performing operations with functions and find inverse functions.
  - Solving nonlinear inequalities.
4. Apply an appropriate model to the problem to be solved by (Gen Ed Comp A, B, C):
  - Writing expressions from data, verbal descriptions or graph.
  - Solving application problems using linear, quadratic, exponential, and logarithmic functions.
5. Make inferences, evaluate assumptions, and assess limitations in estimation modeling and/or statistical analysis by (Gen Ed Comp A, D):
  - Solving linear and nonlinear systems of equations

## LEARNING RESOURCES

- ✓ Bittinger, M. L. et al. (2009). *Algebra & trigonometry: Graphs & models (4th ed.)*. Boston, MA: Pearson Education, Inc.