

**MAT 110 APPLIED MATHEMATICS** (3 credit hours)[KCTCS Course Information](#)

Official Course Description	Includes the concepts of ratio and proportion, units and conversions, linear equations in two variables, inequalities, graphing and writing equation of a line, percents, interest, descriptive statistics, and logical symbolism. Emphasizes applications in the various technologies. Prerequisite: MAT 062 or MAT 065 or equivalent as determined by KCTCS placement examination.
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**OFFICIAL COURSE COMPETENCIES**

Upon completion of this course, the student can:

1. Write the equation of a given line and graph linear equations in two variables;
2. Solve systems of linear equations in two variables;
3. Set up and solve ratios and proportions;
4. Use and interpret scientific notation;
5. Convert between various units of measure;
6. Solve problems involving percents;
7. Solve problems involving significant digits, and accuracy and precision of measurements;
8. Solve problems involving simple and compound interest;
9. Calculate and interpret basic descriptive statistical measures such as mean, median, mode, range, variance, and standard deviation and use the normal distribution.
10. Use logic to determine the validity of arguments.
11. Solve application problems involving the above competencies.

**MAT 110 COURSE OUTLINE**

- I. Number Theory and the Real Number System
  - A. Prime Numbers and Divisibility
  - B. Least Common Multiple and Greatest Common Divisor
  - C. Rules of Exponents
  - D. Scientific Notation
  - E. Operations with Square Roots
  - F. Applications
- II. Measurements and Units
  - A. Significant Digits
  - B. Precision and Accuracy
  - C. Metric Units of Measurement
  - D. Conversions to and from U.S. Customary ("Standard") System of Measurement
  - E. Applications
- III. Algebra and Graphs
  - A. Solving Linear Equations in One Variable
  - B. Solving Proportions
  - C. Graphing Lines
  - D. Writing the Equation of a Given Line
  - E. Applications
- IV. Inequalities and Systems of Linear Equations
  - A. Solving Systems of Linear Equations
  - B. Solving Inequalities
  - C. Applications
- V. Consumer Mathematics
  - A. Percents
  - B. Simple and Compound Interest
  - C. Applications
- VI. Statistics
  - A. Sampling Techniques
  - B. Statistical Graphs and Charts
  - C. Measures of Central Tendency (Mean, Median, Mode)
  - D. Measures of Dispersion (Range, Variance, Standard Deviation)
  - E. Using the Normal Distribution Curve
  - F. Applications
- VII. Logic
  - A. Conjunction, Disjunction, and Conditionals
  - B. Truth Tables
  - C. Categorical Propositions
  - D. Fallacies and Valid Arguments
  - E. Applications

**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 Spring 2018**

Upon completion of MAT 110, the student can:

1. Interpret information presented in mathematical and/or statistical forms by (Gen Ed Comp B):
  - Use and interpret scientific notation;
2. Illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically by (Gen Ed Comp A, B, C):
  - Calculate and interpret basic descriptive statistical measures such as mean, median, mode, range, variance, and standard deviation and use the normal distribution.
3. Determine when computations are needed and execute the appropriate computations by (Gen Ed Comp A, B):
  - Solve problems involving percents;
  - Solve problems involving simple and compound interest;
4. Apply an appropriate model to the problem to be solved by (Gen Ed Comp A, B, C):
  - Convert between various units of measure;
  - Solve application problems involving the above competencies.
5. Make inferences, evaluate assumptions, and assess limitations in estimation modeling and/or statistical analysis by (Gen Ed Comp A, D):
  - Use logic to determine the validity of arguments.

## **LEARNING RESOURCES**

- ✓ Angel, A. and Porter, S. (2001). *A Survey of Mathematics with Applications (6th ed.)* New York: Addison Wesley Longman.
- ✓ Aufmann, R.N. Lockwood, J.S., Nation, R.D., & Clegg, D.K. (2004). *Mathematical Excursions Boston, MA:* Houghton Mifflin Co.
- ✓ Setek, Gallo (2002). *Fundamentals of Mathematics (9th ed)* New Jersey: Prentice Hall.
- ✓ Smith, R. D. (2002). *Technical Mathematics (4th ed.)*. Albany, NY: Delmar-Thompson Learning.