MAT 126 TECHNICAL ALGEBRA AND TRIGONOMETRY (3 credit hours)

[KCTCS Course Information](#)

Official Course Description	Examines mathematical concepts from algebra and trigonometry. Includes vectors, phasor algebra, variation, trigonometric functions, coordinate systems, system of linear equations, quadratic, rational, exponential and logarithmic equations. Prerequisite: MAT 065 or equivalent as determined by KCTCS placement examination.

OFFICIAL COURSE COMPETENCIES/OBJECTIVES

Upon completion of this course, the student can:

1. Solve problems involving ratio, proportion, direct, inverse, and joint variation.
2. Solve rational equations.
3. Define trigonometric functions and use them to solve right triangles.
4. Solve triangles using the law of sines and the law of cosines.
5. Identify the vector concept and the components of vectors, and add vectors.
6. Determine the solutions to simultaneous linear equations using determinants.
7. Solve quadratic equations by the processes of factoring, completing the square, and the quadratic formula.
8. Apply radians and radian measurements including their applications to rotating objects.
9. Utilize Phasor algebra to perform basic operations on complex numbers.
10. Utilize exponent and logarithmic equations such as population growth, time constants and pH scale.
11. Perform conversions between number systems such as decimal, binary, octal, and hexadecimal.
12. Use a scientific calculator.
13. Solve occupation specific application problems using the above competencies.

OFFICIAL COURSE OUTLINE

I. Algebra
   A. Variation
   B. Quadratic Equations
      1. Factoring
      2. Completing the square
      3. Quadratic formula
   C. Rational Equations
   D. Ratio and Proportion
   E. Rectangular Coordinate Plane
   F. Phasor Form
   G. Systems of Linear Equation Solution by Determinants
   H. Exponential Equations
   I. Logarithmic Equations
   J. Complex Numbers

II. Trigonometry
   A. Basic Definitions of Functions
   B. Radians
   C. Law of Sines
   D. Law of Cosines
   E. Polar Coordinates

III. Number systems
   A. Decimal
   B. Binary
   C. Octal
   D. Hexadecimal

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)

Upon completion of MAT 126, the student can:

1. Interpret information presented in mathematical and/or statistical forms by (Gen Ed Comp B):
    - Define trigonometric functions and use them to solve right triangles.
    - Identify the vector concept and the components of vectors, and add vectors.
2. Illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically by (Gen Ed Comp A, B, C):
    - Solve problems involving ratio, proportion, direct, inverse, and joint variation.
    - Utilize Phasor algebra to perform basic operations on complex numbers.
    - Solve triangles using the law of sines and the law of cosines.
3. Determine when computations are needed and execute the appropriate computations by (Gen Ed Comp A, B):
    - Solve quadratic and rational equations.
    - Perform conversions between number systems such as decimal, binary, octal, and hexadecimal.
4. Apply an appropriate model to the problem to be solved by (Gen Ed Comp A, B, C):
    - Apply radians and radian measurements including their applications to rotating objects.
    - Utilize exponent and logarithmic equations such as population growth, time constants and pH scale.
5. Make inferences, evaluate assumptions, and assess limitations in estimation modeling and/or statistical analysis by (Gen Ed Comp A, D):
    - Solve occupation specific application problems using course competencies.

LEARNING RESOURCES

- ✓ Cleaves and Hobbs (2004). College Mathematics for Technology (6rd ed.). Upper Saddle River, NJ: Prentice Hall
- ✓ Deem, B. R., & Zannini, T. (2003). Electronics and Computer Math (7th ed.). Upper Saddle River, NJ: Prentice Hall