

CORE COURSE PERFORMANCE OBJECTIVES

The student will be able to:

1. Perform basic operations of intermediate algebra. (CCC 2, 7)
2. Use functional definitions and the algebra of functions to solve applications of linear and quadratic functions (CCC 2, 7)
3. Solve problems involving polynomial, exponential and logarithmic functions. (CCC 2, 7)
4. Solve problems of applications involving circular and trigonometric functions.
5. Solve trigonometric application problems using right triangle definitions and oblique triangle principles. (CCC 2, 7)
6. Solve problems of applications involving vectors. (CCC 2, 7)
7. Perform basic operations on complex numbers (CCC 2,7)
8. Demonstrate principles of analytic geometry working with conic sections. (CCC 2, 7)
9. Solve linear and nonlinear systems (CCC 6,7)
10. Perform operations on matrices (CCC6,7)

MEASURABLE PERFORMANCE OBJECTIVES

- 1. Perform basic operations of intermediate algebra. (CCC 2, 7)**
 - 1.1 Perform basic operations on the set of real numbers, including order of operations, absolute value, and fractions.
 - 1.2 Perform basic operations on polynomials, including addition, subtraction, multiplication and evaluation, and division by a monomial.
 - 1.3 Perform basic operations with integer exponents.
 - 1.4 Demonstrate your ability to factor polynomials.
 - 1.5 Demonstrate your ability to work with rational expressions by adding, subtracting, multiplying, and dividing the given expressions.
 - 1.6 Simplify complex fractions.
 - 1.7 Write radicals in simplest radical form.
 - 1.8 Demonstrate your ability to rationalize the numerator or the denominator of a radical expression.
 - 1.9 Solve first degree equations in one unknown.

- 1.10 Solve first degree equations involving absolute value.
- 1.11 Solve second degree equations by factoring, quadratic formula, and completing the square.
- 1.12 Solve radical equations.
- 1.13 Demonstrate your ability to solve applications of equations.
- 1.14 Solve inequalities.
- 1.15 Solve inequalities involving absolute values.

2. Use functional definitions and the algebra of functions to solve applications of linear and quadratic functions (CCC 2, 7)

- 2.1 Define a function and a relation.
- 2.2 Evaluate a function.
- 2.3 Find the domain and range of a function.
- 2.4 Use the vertical line rule to classify relations as functions.
- 2.5 Solve applications of function problems.
- 2.6 Find the slope of a nonvertical line
- 2.7 Write the equation of a line using point-slope or slope-intercept form of a line.
- 2.8 Draw the graph of a linear equation.
- 2.9 Write the equation of a line perpendicular or parallel to a given line or segment.
- 2.10 Solve applications of linear functions.
- 2.11 Put a quadratic equation of a parabola in standard form.
- 2.12 Sketch the graph of a parabola.
- 2.13 Graph and identify functions in the form: $y = \sqrt{x}$, $y = \frac{1}{x}$, $y = x^3$.
- 2.14 Solve applications of quadratic functions.

- 2.15 Use additional graphing techniques to graph quadratic functions
- 2.16 Given functions $f(x)$ and $g(x)$ find $f + g$, $f - g$, fg , $f \circ g$.
- 2.17 Find the domain of the composition of functions.
- 2.18 Find the inverse of a function.
- 2.19 Solve variation problems.
- 3. Solve problems involving polynomial, exponential and logarithmic functions. (CCC 2, 7)**
 - 3.1 Given two polynomials, divide them using long division.
 - 3.2 Given two polynomials, divide them using synthetic division.
 - 3.3 Use the Remainder and Factor Theorem.
 - 3.4 Use Descartes' Rule of Signs.
 - 3.5 Graph a function of the form $ab^{p(x)}$.
 - 3.6 Change an expression in the form $y = x^a$ to the form $\log_x y = a$.
 - 3.7 Solve logarithmic equations.
 - 3.8 Solve exponential equations.
 - 3.9 Solve applications of exponential and logarithmic functions.
- 4. Solve problems of applications involving circular and trigonometric functions (CCC 2, 7)**
 - 4.1 Change an angle in decimal form to degrees minutes and seconds.
 - 4.2 Change an angle in degrees minutes and seconds to decimal degrees.
 - 4.3 Convert an angle in degrees to radian.
 - 4.4 Convert an angle in radian to degrees.
 - 4.5 Graph an angle in standard position.
 - 4.6 Use the formula $\theta = \frac{s}{r}$ to solve for the indicated parts.

- 4.7 Define the six circular functions in terms of a unit circle and a right triangle.
 - 4.8 Sketch the curves of six circular functions, and identify the amplitude, period, and phase shift.
- 5. Solve trigonometric application problems using right triangle definitions and oblique triangle principles. (CCC 2, 7)**
- 5.1 Use notational conventions in trigonometry.
 - 5.2 Memorize basic right-triangle identities.
 - 5.3 Simplify trigonometric expressions.
 - 5.4 Verify that a given trigonometric expression is an identity.
 - 5.5 Solve trigonometric equations.
 - 5.6 Solve applications of trigonometric equations.
 - 5.4 Solve for the indicated parts of a right triangle.
 - 5.5 Solve application problems involving right triangles.
 - 5.6 Develop the laws of sines and cosines and use them to solve applications problems involving oblique triangles.
 - 5.7 Solve non-right triangles for the indicated part, using the Law of Sines.
 - 5.8 Solve non-right triangles for the indicated parts, using the Law of Cosines.
- 6. Solve problems of applications involving vectors. (CCC 2, 7)**
- 6.1 Sketch the graphs of sine and cosine functions considering their period, amplitude and phase shift.
 - 6.2 Solve application problems involving simple harmonic motion.
 - 6.3 Graph the tangent and reciprocal functions.
 - 6.4 Define and illustrate vectors in a plane using a geometric approach.
 - 6.5 Define and use vectors in the plane using an algebraic approach.
 - 6.6 Define a vector and be able to find its i , j components.

- 6.7 Solve vector problems.
- 7. Perform basic operations on complex numbers (CCC 2,7)**
 - 7.1 Define complex numbers and the imaginary unit, real and imaginary parts.
 - 7.2 Determine equality of complex number and find the complex conjugate of complex numbers.
 - 7.3 Perform the basic operations of addition, subtraction, multiplication, and division of complex numbers.
 - 7.4 Change a given complex number to trigonometric form.
 - 7.5 Use trigonometric or polar forms of complex numbers and DeMoivre's Theorem to multiply and divide, and find powers and roots of complex numbers.
 - 7.6 Use DeMoivre's Theorem to raise a complex number to a power.
 - 7.7 Use DeMoivre's Theorem to find the roots of a complex number.
 - 7.8 Explore the roots of unity.
- 8. Demonstrate principles of analytic geometry working with conic sections. (CCC 2, 7)**
 - 8.1 State the definition of the four conics.
 - 8.2 Sketch the graph of a given equation of a circle.
 - 8.3 Given information about a circle write the equation.
 - 8.4 Sketch the graph of a given equation of a parabola.
 - 8.5 Given information about a parabola write the equation.
 - 8.6 Sketch the graph of a given ellipse.
 - 8.7 Given information about an ellipse write the equation.
 - 8.8 Sketch the graph of a hyperbola.
 - 8.9 Given information about a hyperbola write the equation.
 - 8.10 Solve application problems involving conics.

9. Solve linear and nonlinear systems (CCC 6,7)

- 9.1 Solve linear systems of equations using the augmented matrix and elementary row operations.
- 9.2 Use Cramer's Rule to solve a linear system of equations.
- 9.3 Solve nonlinear systems of equations.
- 9.4 Solve linear programming problems using systems of linear inequalities.

10. Perform operations on matrices (CCC6,7)

- 10.1 Define equality of matrices.
- 10.2 Perform matrix operations of addition, subtraction, multiplication, and the multiplication of two matrices.
- 10.3 Find the inverse of a square matrix.
- 10.4 Use the inverse matrix and a graphing calculator to solve a linear systems of equations.
- 10.5 Find the determinant of a square matrix.

EVALUATION CRITERIA

Students will demonstrate proficiency on all Measurable Performance Objectives at least to the 75% level. The grade will be determined using the College Grading System:

92 - 100	A
83 - 91	B
75 - 82	C
0 - 74	R

Students should refer to the Student Handbook for information on Academic Standing Policy, Academic Honesty Policy, Students Rights and Responsibilities and other policies relevant to their academic progress.