ALGEBRA II
Course Syllabus

Course Number:  SCMA-0006  
OHLAP Credit:  Yes
OCAS Code:  4412
Course Length:  120 Hours
Career Cluster:  Science, Technology, Engineering and Mathematics
Career Pathway:  Engineering and Technology
Career Major(s):  Pre-Engineering Aerospace, Pre-Engineering Civil & Architecture, Pre-Engineering Mechanical, PLTW Biomedical Science and Medicine, Construction Academy

Pre-requisite(s):  This course will enhance and expand the mathematical foundations of Algebra I and Geometry. The course will stress the fundamental extension of previous mathematics and the preparation for future higher-level mathematics courses. It will involve operations with real and complex numbers as well as matrices. The problem solving processes will use functions and relations. Within the course applications of math, and while satisfying predictions based on a set of data, the use of data analysis, and statistics will be justified. Students who master CareerTech Algebra II will gain experience with quadratic functions, conic sections, logarithmic and exponential functions, linear functions, solution methods for systems of linear functions, and matrix operations.

Textbooks:  Algebra 2 (2011), Prentice Hall- Pearson

Course Objectives:  Chapter 1  Expressions, equations, and inequalities, absolute value
Chapter 2  Functions, equations and the graphs
2.1a  Recognize the parent graphs of polynomial, exponential, and logarithmic functions and predict the effects of transformations on the parent graphs, using various methods and tools which may include graphing calculators.
2.1.d  Use algebraic, interval, and set notations to specify the domain and range of functions of various types
3.1.a  Display data on a scatter plot.
3.1.b  Interpret results using a linear, exponential, quadratic model/equation.
Chapter 3  Linear Systems
2.2a  Model a situation that can be described by a system of equations and inequalities, and use the model to answer questions about the situation.
2.2.b  Solve systems of linear equations and inequalities using various methods and tools which may include substitution, elimination, matrices, graphing, and graphing calculators.
Chapter 4  Quadratic functions and equations

2.3.a Solve quadratic equations by graphing, factoring, completing the square, and quadratic formula.

2.3.b Graph a quadratic function and identify the x- and y-intercepts and maximum or minimum value, using various methods and tools which may include a graphing calculator.

2.3.c Model a situation that can be described by a quadratic function and use the model to answer questions about the situation.

3.1b Interpret results using a linear, exponential, or quadratic model/equation.

Chapter 5  Polynomials and their functions

1.2.a Divide polynomial expressions by lower degree polynomials.

2.6.a Solve polynomial equations using various methods and tools which may include factoring and synthetic division.

2.6.b Sketch the graph of a polynomial function.

2.6c Given the graph of a polynomial function, identify the x- and y-intercepts, relative maximums and relative minimums, using various methods and tools which may include a graphing calculator.

2.6.d Model a situation that can be described by a polynomial function, and use the model to answer questions about the situation.

Chapter 6  Radical functions and Rational exponents

1.1.a Convert expressions from radical notations to rational exponents and vice versa.

1.1.b Add, subtract, multiply, divide, and simplify radical expressions and expressions containing rational exponents.

2.1.b Use function notation to add, subtract, multiply, and divide functions.

2.1.c Combine functions by composition.

2.1.d Use algebraic, interval, and set notations to specify the domain and range of functions of various types.

2.1.e Find and graph the inverse of a function, if it exists.

Chapter 7  Exponential and logarithmic functions

2.5.a Graph exponential and logarithmic functions.

2.5.b Apply the inverse relationship between exponential and logarithmic functions to convert from one form to another.
2.5.c Model a situation that can be described by an exponential or logarithmic function, and use the model to answer questions about the situation.

3.1.b Interpret results using a linear, exponential, or quadratic model/equation.

Chapter 8 Rational functions

1.2.b Add, subtract, multiply, divide, and simplify rational expressions, including complex fractions.

2.1.d Use algebraic, interval, and set notations to specify the domain and range of functions of various types.

2.7a Solve rational equations.

2.7.b Sketch the graph of a rational function.

2.7.c Given the graph of a rational function, identify the x- and y-intercepts, asymptotes, using various methods and tools which may include a graphing calculator.

2.7.d Model a situation that can be described by a rational function, and use the model to answer questions about the situation.

Chapter 9 Sequences and Series

3.3 Identify and use arithmetic and geometric sequences and series to solve problems.

Chapter 10 Quadratic relations and conic sections

2.4 Identify, graph, and write the equations of the conic sections (circle, ellipse, parabola, and hyperbola).

Chapter 11 Probability and Statistics

3.2.a Analyze and synthesize data from a sample, using appropriate measures of central tendency (mean, median, mode, weighted average).

3.2.b Analyze and synthesize data from a sample, using appropriate measures of variability (range, variance, standard deviation).

3.2.c Use the characteristics of the Gaussian normal distribution (bell-shaped curve) to solve problems.

3.2.d Identify how given outliers affect

Chapter 12 Matrices

2.2.a Model a situation that can be described by a system of equations and inequalities, and use the model to answer questions about the situation.

2.2.b Solve systems of linear equations and inequalities using various methods and tools which may include substitution, elimination, matrices, graphing, and graphing calculators.
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Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and shop practice and performance.
2. Each course must be passed with seventy (70%) percent or better.
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit: The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better.