Eastern WV Community & Technical College
Master Course Record

Course Prefix and Number: MTH 123
Course Title: Intermediate Algebra
Recommended Transcript Title (if over 40 characters) Intermediate Algebra
Date Approved/Revised July 15, 2013; October 16, 2013; November 13, 2014; October 13, 2016
Credit Hours: 3 **Contact hours per week (Based on 15 week term):** **Lecture:** 3 **Lab:**
Prerequisite: MTH 103 or minimum acceptable test scores for placement in college-level math (Math ACT score 19 or higher; SAT math score 500 or higher; or ACCUPLACER Elementary Algebra score of 76 or higher). **Corequisite:** **Pre/Corequisite:**
Grading Mode: Letter Grade Students may test out of this course by passing a challenge test at 70% or better prior to starting the course. A challenge fee applies.
Catalog Description: This course covers a study of linear and absolute value equations and inequalities in one and two variables; polynomial operations and graphing; linear, quadratic, radical, rational, exponential, and logarithmic functions with applications and graphing; mathematical modeling from data; and formula manipulation. This course is designed to prepare students for college algebra and science courses or for career opportunities.
Course Outcomes: 1. Evaluate functions 2. Graph linear functions and use linear functions to solve applications 3. Solve and graph inequalities 4. Perform operations on polynomials 5. Solve rational equations and inequalities 6. Simplify radical expressions 7. Solve quadratic equations 8. Solve problems involving exponential and logarithmic functions
Implementation Cycle: Fall and Spring semesters
Role in College Curriculum: (Check all that apply) X **General Education Core** Mathematics □ **Technical Core** □ **Restricted Elective** □ **General Elective** □ **Workforce Education** □ **Other**

Course Fee:

Instructor's Qualifications: Master's Degree plus 18 graduate level mathematics credits

Expanded Course Description

In this course, the focus will be on the development of problem solving skills and mathematical thinking ability. Symbolic, graphical, and numeric solution methods are explored as is mathematical modeling of data using a graphing calculator.

Expanded Course Outcomes:

1. Evaluate functions
    a. Find the domain and range of a relation
    b. Determine whether a relation is a function
    c. Apply the vertical line test
    d. Find the domain and range of a function
    e. Evaluate functions
    f. Find the zeros of a function
    g. Evaluate piecewise functions
    h. Perform operations on functions
    i. Find the domain of the sum, difference, product, or quotient of functions
    j. Evaluate composite functions
    k. Determine whether a function is one-to-one
    l. Find a formula for the inverse of a one-to-one function
    m. Graph a function and its inverse on the same set of axes
2. Graph linear functions and use linear functions to solve applications
    a. Graph linear functions
    b. Find slope
    c. Find a linear function given its slope and y-intercept
    d. Find the intercepts of a function
    e. Determine whether two lines are parallel, perpendicular, or neither
    f. Use point-slope form to write an equation of a line
    g. Solve application problems modeled with a linear function
    h. Use a linear function to interpolate or extrapolate data
3. Solve and graph inequalities
    a. Write inequalities in interval notation and set-builder notation
    b. Graph linear inequalities in one variable
    c. Solve linear inequalities in one variable
    d. Find the intersection or the union of two sets
    e. Solve compound inequalities
    f. Solve absolute value equations
    g. Solve absolute value inequalities
    h. Graph linear inequalities in two variables

i. Graph a system of linear inequalities
j. Identify an ordered pair that is a solution to a linear equality in two variables

4. Perform operations on polynomials
    a. Identify characteristics of polynomials such as terms, degree, leading coefficient, etc.
    b. Evaluate polynomials
    c. Use the graph of a polynomial to identify its range
    d. Use a graphing utility to analyze functions
    e. Simplify polynomials by combining like terms
    f. Add and subtract polynomials
    g. Multiply polynomials
    h. Find the zeros of a polynomial function
    i. Find the greatest common factor
    j. Factor by grouping
    k. Solve polynomial equations by factoring and applying the zero product property
    l. Factor trinomials
    m. Construct a polynomial function with the given zeros
    n. Recognize a perfect square trinomial
    o. Factor difference of squares and the sum and difference of cubes
    p. Solve application problems modeled with a quadratic equation
    q. Divide polynomials
    r. Use synthetic division to divide polynomials
5. Solve rational equations and inequalities
    a. Find the domain of a rational function
    b. Solve rational equations
    c. Solve rational inequalities
6. Simplify radical expressions
    a. Evaluate radical functions
    b. Simplify radical expressions
    c. Find the domain of a radical function
    d. Convert between radical notation and a rational exponent
    e. Simplify expressions using the laws of exponents
    f. Approximate radicals using a calculator
    g. Multiply radical expressions
    h. Divide radical expressions
    i. Rationalize a denominator
    j. Add or subtract radical expressions
    k. Solve an equation containing one or more radical expressions

l. Rewrite square roots of negative numbers in terms of *i*
m. Add, subtract, multiply, and divide complex numbers

7. Solve quadratic equations
   a. Solve quadratic equations using the square root property
   b. Solve quadratic equations by completing the square
   c. Solve quadratic equations using the quadratic formula
   d. Use the discriminant to classify the solutions of a quadratic equation
   e. Construct a quadratic equation with the given solutions
   f. Solve application problems modeled with a quadratic equation
   g. Solve a formula for the indicated variable
   h. Solve equations that are quadratic in form
   i. Graph quadratic functions
   j. Identify the vertex, axis of symmetry, and minimum or maximum value of a quadratic function
   k. Identify the intercepts of a quadratic function
   l. Convert a quadratic function to vertex form
8. Solve problems involving exponential and logarithmic functions
   a. Recognize the properties of an exponential function from its graph
   b. Solve applications involving exponential functions
   c. Simplify logarithms
   d. Recognize the properties of a logarithmic function from its graph
   e. Convert between a logarithmic equation and an exponential equation
   f. Solve logarithmic equations using the definition of a logarithm
   g. Use the properties of logarithms to expand or condense a logarithmic expression

Prepared by: Andrea Williams, Mathematics Instructor 11/13/14

Name, Title Date

Approved Per LOT Minutes

Dean, Academic and Student Services Date