Eastern WV Community & Technical College
Master Course Record

Course Prefix and Number: MTH 126
Course Title: Trigonometry
Recommended Transcript Title: Trigonometry
Date Approved/Revised: June 30, 2005; October 13, 2015; October 13, 2016
Credit Hours: 3 **Contact hours per week (Based on 15 week term)** **Lecture:** 3 **Lab:**
Prerequisite: MTH 123 or minimum acceptable test scores for placement in college-level math (Math ACT score 23 or higher; SAT math score 570 or higher; or ACCUPLACER Elementary Algebra score of 109 or higher). **Corequisite:** None **Pre/Corequisite:** None
Grading Mode: Letter Grade
Catalog Description: This course is a study of trigonometric functions and their applications including an exploration of right triangle trigonometry, circular functions, graphs of trigonometric functions, trigonometric identities and equations, complex numbers, vectors, and polar coordinates and equations. Analytic geometry, parametric equations, sequences and series, the binomial theorem, and mathematical induction are also introduced.
Course Outcomes: 1. Define, evaluate, and graph trigonometric functions 2. Define and evaluate inverse trigonometric functions 3. Verify trigonometric identities and solve trigonometric equations 4. Solve applications using trigonometric functions 5. Graph polar and parametric equations 6. Graph and perform operations with vectors 7. Graph and write equations for conic sections 8. Find terms and sums of sequences 9. Use the binomial theorem to expand expressions 10. Use mathematical induction to prove statements
Implementation Cycle: Fall and Spring semesters
Role in College Curriculum: (Check all that apply) **X General Education Core (Specify category)** Mathematics **□ Technical Core (Specify Program)** **□ Restricted Elective (Specify program)** **□ General Elective** **□ Workforce Education** **□ Other (Please specify)**
Course Fee: None
Instructor's Qualifications: Master's Degree plus 18 graduate level mathematics

credits.

Expanded Course Description:
This course is provided to students as an additional transferable math elective. It is designed to develop competency in the basic trigonometric skills necessary to succeed in future math courses.

Expanded course outcomes:

1. Define, evaluate, and graph trigonometric functions
    a. Convert from degrees to radians and from radians to degrees
    b. Recognize coterminal angles
    c. Find the arc length of a circle
    d. Find the area of a sector of a circle
    e. Find linear speed and angular speed
    f. Define each of the trig functions in terms of a point on the unit circle
    g. Find exact values of trig functions of common angles
    h. Approximate trig values with a calculator
    i. Identify the domain and the range of trig functions
    j. Identify the period of trig functions
    k. Find the exact value of trig expressions using periodic properties
    l. Determine the quadrant of an angle given the signs of its trig values
    m. Find the exact value of trig expressions using identities
    n. Find the exact value of trig functions given the value of one function and the quadrant of the angle
    o. Graph trig functions, employing transformations when necessary
    p. Identify the amplitude of trig functions
    q. Find exact values of trig functions using sum and difference formulas
    r. Find exact values of trig functions using double-angle and half-angle formulas
    s. Define each of the trig functions in terms of a right triangle
    t. Find exact values of trig functions given a right triangle
2. Define and evaluate inverse trigonometric functions
    a. Define inverse trig functions
    b. Identify the domain and range of inverse trig functions
    c. Find exact values of the inverse trig functions
    d. Approximate inverse trig values with a calculator
    e. Find exact values when composing trig functions and inverse a trig functions
    f. Solve equations involving inverse trig functions
3. Verify trigonometric identities and solve trigonometric equations
    a. Use algebraic techniques to simplify trig expressions
    b. Verify trig identities
    c. Solve trig equations algebraically
    d. Use a graphing utility to solve trig equations
4. Solve applications using trigonometric functions

a. Solve a right triangle
b. Solve applied problems involving right triangles
c. Use the law of sines or the law of cosines to solve an oblique triangle
d. Find the area of a triangle

5. Graph polar and parametric equations
    a. Plot points using polar coordinates
    b. Convert from polar coordinates to rectangular coordinates and vice versa
    c. Convert a polar equation to a rectangular equation and vice versa
    d. Identify and graph polar equations
    e. Convert a complex number from rectangular form to polar form
    f. Plot points in the complex plane
    g. Find products and quotients of complex numbers in polar form
    h. Use De Moivre's Theorem
    i. Find complex roots
    j. Graph parameter equations
    k. Find a rectangular equation for a parametric curve
    l. Find parametric equations for a rectangular equation
6. Graph and perform operations with vectors
    a. Add and subtract vectors algebraically and graphically
    b. Perform scalar multiplication of vectors algebraically and graphically
    c. Find the components of a vector
    d. Find the magnitude of a vector
    e. Find a unit vector
    f. Find a vector from its direction and magnitude
    g. Compute the dot product of two vectors
    h. Find the angle between two vectors
7. Graph and write equations for conic sections
    a. Graph parabolas
    b. Write the equation of a parabola
    c. Graph ellipses
    d. Write the equation of an ellipse
    e. Graph hyperbolas
    f. Write the equation of a hyperbola
    g. Recognize and graph polar equations of conics
8. Find terms and sums of sequences
    a. Find the *n*th term of a sequence
    b. Use summation notation and the properties of sums
    c. Find the sum of a finite sequence
    d. Find the *n*th term of an arithmetic sequence
    e. Find the sum of a finite arithmetic series
    f. Find the *n*th term of a geometric sequence
    g. Find the sum of finite and infinite geometric series
9. Use the binomial theorem to expand expressions
    a. Calculate binomial coefficients

b. Use the binomial theorem to expand binomial expressions
c. Find a specific term of a binomial expansion

10. Use mathematical induction to prove statements

Prepared by:
Andrea Williams, Math Faculty 10/13/15
Name, Title Date

Approved Per LOT Minutes

Dean, Academic and Student Services Date