Eastern WV Community & Technical College
Master Course Record

Course Prefix and Number: MTH 117
Course Title: Math for Technicians
Recommended Transcript Title: Math for Technicians
Date Approved/Revised: 7/16/08; 11/18/13; 11/13/14; 11/10/16; 10/5/17
Credit Hours: 4 **Contact hours per week (Based on 15 week term):** **Lecture:** 4 **Lab:**
Prerequisite: Math ACT score 19 or higher; SAT math score 500 or higher; or ACCUPLACER Arithmetic score of 85 or higher. **Corequisite:** MTH 117L if required by placement. **Pre/Corequisite:**
Grading Mode: Letter Grade
Catalog Description: This course introduces the students to mathematics applicable to technical programs of study. The class includes techniques, instruments, and calculations used to make physical and electrical measurement. The concept and application of dimensional analysis will be introduced. The fundamentals of algebra, basic geometry, and triangle trigonometry will be studied.
Course Outcomes: 1. Perform operations on real numbers 2. Calculate and convert measurements 3. Apply algebraic techniques to simplify expressions, solve equations, and evaluate formulas 4. Apply geometric concepts to calculate angle measure, perimeter, area, volume, and surface area 5. Use trigonometry to solve applied problems involving right and oblique triangles
Implementation Cycle: Spring
Role in College Curriculum: (Check all that apply) **Ξ General Education Core:** Mathematics **□ Technical Core (Specify category)** **□ Restricted Elective (Specify category)** **□ General Elective** **□ Workforce Education** **□ Other (Please specify)**
Course Fee: None
Instructor's Qualifications: Master's Degree preferred with 18 graduate hours in Mathematics or Engineering or related field.
Expanded Course Description:

This course will feature instructor-led classes emphasizing student participation, collaborative learning, and hands-on activities, plus a lab with computer-assisted tutorials.

Expanded course outcomes:

1. Perform operations on real numbers
    a. Add, subtract, multiply, and divide whole numbers
    b. Round whole numbers to a specified place value
    c. Evaluate expressions using the order of operations
    d. Add, subtract, multiply, and divide fractions
    e. Add, subtract, multiply, and divide decimals
    f. Round decimal numbers to a specific place value
    g. Convert a fraction to a decimal
    h. Solve a proportion for an unknown quantity
    i. Use proportions to solve applied problems
    j. Add, subtract, multiply, and divide integers
    k. Evaluate expressions involving exponents
    l. Evaluate radical expressions
    m. Translate phrases into mathematical expressions
2. Calculate and convert measurements
    a. Perform calculations using significant figures
    b. Describe the difference between precision and accuracy in measurements
    c. Explain tolerance as used in technical measurements
    d. Explain the concept of a unity fraction
    e. Apply dimensional analysis in performing technical calculations
    f. Describe dual dimensioning
    g. Convert units of measurements between metric and US Customary System
    h. Convert temperature measurements between Fahrenheit and Celsius
    i. Perform measurements of length using a graduated rule
    j. Explain the use of a vernier scale
    k. Perform measurements using a micrometer
    l. Perform measurements using a vernier caliper
    m. Explain the range of a meter scale
    n. Describe multi-scale meter scales
    o. Perform measurements using an analog multimeter
3. Apply algebraic techniques to simplify expressions, solve equations, and evaluate formulas
    a. Evaluate formulas and literal expressions
    b. Add, subtract, multiply, and divide simple algebraic expressions
    c. Solve single variable linear equations
    d. Develop mathematical expressions or equations from sentences and phrases

e. Convert between decimal numbers and scientific notation
f. Multiply and divide using scientific notation

4. Apply geometric concepts to calculate angle measure, perimeter, area, volume, and surface area
    a. Define the components of an angle
    b. Measure angles with a protractor
    c. Draw an angle of specified size
    d. Classify the types of angles
    e. Analyze simple geometric relationships involving intersecting lines
    f. Define polygon
    g. Identify polygons
    h. Define perimeter
    i. Classify types of triangles
    j. Apply the Pythagorean Theorem
    k. Calculate the perimeter of geometric figures
    l. Calculate the area of geometric figures
    m. Define a circle
    n. Calculate the circumference of a circle
    o. Define the parts of a circle
    p. Calculate the area of a circle
    q. Identify solid figures
    r. Define frustum
    s. Calculate the surface area of solid objects
    t. Calculate the volume of solid objects
5. Use trigonometry to solve applied problems involving right and oblique triangles
    a. Define radian measurement
    b. Analyze geometric data to identify right triangles
    c. Perform calculations involving the sine ratio
    d. Perform calculations involving the cosine ratio
    e. Perform calculations involving the tangent ratio
    f. Convert between radians and degrees
    g. Calculate arc length
    h. Calculate sector area
    i. Calculate linear and angular speeds
    j. Convert between decimal degrees and degree-minute-second format
    k. Determine an angle from its trigonometric function
    l. Solve a right triangle
    m. Define oblique triangle
    n. Calculate triangle parameters using the Law of Sines
    o. Calculate triangle parameters using the Law of Cosines

Prepared by: Andrea Williams, Mathematics Faculty 10/5/17

Course Number & Title: MTH 117-Math for Technicians
Date Prepared: 05/07/08; 11/18/13
Date Revised: 07/08/08; 11/18/13; 11/13/14; 11/10/16; 10/5/17
Date Approved by Curriculum Committee: 12/6/16; 10/5/17
Date Course Approved by LOT: 07/16/08; 11/18/13; 11/17/14; 12/12/16; 10/16/17

Name, Title Date

Approved Per LOT Minutes:

Dean of Teaching and Learning Date

Course Number & Title: MTH 117-Math for Technicians
Date Prepared: 05/07/08; 11/18/13
Date Revised: 07/08/08; 11/18/13; 11/13/14; 11/10/16; 10/5/17
Date Approved by Curriculum Committee: 12/6/16; 10/5/17
Date Course Approved by LOT: 07/16/08; 11/18/13; 11/17/14; 12/12/16; 10/16/17