

# Course Syllabus

## Wayne County Community College District

EE 115      Math for E/E II

**CREDIT HOURS:** 4.00

**CONTACT HOURS:** 60.00

**COURSE DESCRIPTION:**

Simultaneous equations, complex algebra, quadratic equations, trigonometry, vectors, series, derivatives and integrals are used to analyze, AC circuits, filter networks and electronic semiconductor circuits.

**PREREQUISITES:** *EE 107*

**EXPECTED COMPETENCIES:**

Upon successful completion of this course, the student will:

- Determine the sign of a trigonometric function in any of the four quadrants, or if given sign(s) of trigonometric function(s), determine the quadrant(s)
- Determine the six trigonometric functions from a point on the terminal side of an angle in any quadrant
- Determine the reference angle for an angle whose terminal side lies in any quadrant
- Find the value of the trigonometric functions for any given angle
- Determine the measure of an angle in any quadrant given its trigonometric value
- Convert angle measured in degrees to radians, and vice versa
- Find the value of a trigonometric function given an angle measured in radian, and vice versa
- Apply radian measure to find the length of a circular arc, the area of a circular sector, and angular and linear velocity
- Find the resultant of a given set of vectors
- Use vectors to solve problems in science and technology
- Apply the law of sines to solve oblique triangles
- Apply the law of cosines to solve oblique triangles
- Apply the law of sines and law of cosines to solve technical problems
- Identify the amplitude, period, and phase angle of a sine, or cosine trigonometric function
- Sketch the graph of a sine or cosine function using its amplitude, period, and phase angle
- Apply the concept of amplitude, period, and phase shift to simple harmonic motion and ac circuits
- Graph the secant, cosecant, and tangent functions
- Use addition or ordinate to graph composite functions
- Graph parametric equations
- Prove that a given trigonometric expression is an identity
- Apply the formula for the sum or difference of two angle to simplify a trigonometric expression and to verify and identify
- Apply the double-and half angle formulas to simplify a trigonometric expression and to verify an identity
- Write a trigonometric expression as a single term by using the appropriate sum, difference, half-or double-angle formula

- Solve a trigonometric equation
- Use the inverse trigonometric functions to evaluate an expression
- Add, subtract, multiply and divide imaginary numbers
- Simplify powers of the imaginary number  $j$
- Add, subtract, multiply and divide complex numbers in rectangular form
- Convert complex numbers among rectangular, polar, and exponential forms
- Use polar and exponential forms to find the product, quotient, power, and roots of complex numbers
- Apply the concept of complex numbers to ac circuits
- Determine the equation of a line from given information
- Determine the slope, x intercept, and y intercept of an equation, and use this information to graph the line
- Find the center and radius of a circle given the equation in standard or general form
- Find the equation of a circle given pertinent information
- Find the focus, directrix, and vertex of a parabola from its equation, and sketch the graph of the parabola
- Find the equation of a parabola from given information
- Find the center, vertices, foci, and endpoints of the minor axis of an ellipse, and sketch the graph of the parabola
- Find the equation of an ellipse from given information
- Find the center, vertices, foci and endpoints of the conjugate axis, and the slope of the asymptote of a hyperbola, and sketch the graph of the hyperbola
- Organize data into a frequency distribution and give a graphical representation using a histogram or a frequency polygon
- Calculate the arithmetic mean, median, and mode from empirical data
- Calculate the range and standard deviation from empirical data
- Use the mean and standard deviation to calculate the variation of data value that should fall within one or two standard deviations of the mean
- Use the least squares method to fit empirical data to an equation
- Find the  $n$ th term of an arithmetic progression from given information
- Determine the sum of the first  $n$  terms of a geometric progression
- Find the sum of an infinite geometric progression
- Represent a repeating decimal in fractional form
- Apply the binomial formula to raise a binomial to a given power
- Apply Pascal's triangle to expand a binomial to a given power
- Find a specified term in a binomial expansion
- Determine whether a given number is continuous
- Determine
- The limit of a given function
- Use the delta process to find the derivative of a function and evaluate the result at a specified value
- Find the derivative of a polynomial function by using the constant, constant multiplier, sum or difference rules
- Find the derivative of functions that are products of  $f$ , quotient, or powers of polynomial functions
- Use implicit differentiation to find the derivative of a function
- Apply a concept of differentiation to technical problems

#### **ASSESSMENT METHODS:**

Student performance may be assessed by examination, quizzes, case studies, oral reports, group discussion, written reports or presentations. The instructor reserves the option to employ one or more of these assessment methods during the course.

**GRADING SCALE:**

A = 94% to 100%

B = 87% to 93%

C = 80% to 86%

D = 73% to 79%

E = less than 72%