COURSE OUTLINE: MTH143 - MATHEMATICS

Prepared: Mathematics Department
Approved: Sherri Smith, Chair, Natural Environment, Business, Design and Culinary

Course Code: Title	MTH143: MATHEMATICS
Program Number: Name	4026: ELECTRICAL TN-PROC
Department:	MATHEMATICS
Semesters/Terms:	19W
Course Description:	This course is a continuation of MTH142 for engineering technology students. Topics of study include angles, vectors, oblique triangles, trigonometric functions, exponents and radicals, complex numbers, plane analytic geometry, and an introduction to statistics. The goals of this course are, first to show that mathematics does play a most important role in the development and understanding of the various fields of technology and, secondly to ensure that students acquire the mathematical and critical thinking skills necessary to analyze and solve engineering technology problems.
Total Credits:	5
Hours/Week:	4
Total Hours:	60
Prerequisites:	MTH142
Corequisites:	There are no co-requisites for this course.
Substitutes:	MTH220, MTH612, MTH613, OEL840
This course is a pre-requisite for:	MCH125, MTH551
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 10 Manage the use of time and other resources to complete projects.
Course Evaluation:	Passing Grade: 50%, D
Books and Required Resources:	Basic Technical Mathematics with Calculus and MyMathLab Software (10th Edition) Washington, SI Version by Washington and Boue Publisher: Pearson Edition: 10 ISBN: 9780133523669

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Trigonometric Functions of Any Angle	1.1 Find any trigonometric function of any angle in any quadrant. 1.2 Find an angle given a trigonometric function. 1.3 Convert angles between radians, degrees and revolutions. 1.4 Solve application problems involving trigonometric

	functions.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Vectors and Oblique Triangles	2.1 Determine the resultant of two or more vectors. 2.2 Resolve a vector into its components. 2.3 Solve applied problems requiring vectors. 2.4 Solve oblique triangles using the law of sines and the law of cosines. 2.5 Solve applied problems requiring oblique triangles.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Graphs of Trigonometric Functions	3.1 Find the amplitude, period, frequency and phase angle for a sine wave or cosine wave. 3.2 Write the sine function or cosine function given the amplitude, period and phase. 3.3 Graph sine, cosine and tangent functions.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Complex Numbers	4.1 Write complex numbers in rectangular, polar, trigonometric and exponential forms. 4.2 Graph complex numbers in both rectangular and polar form. 4.3 Find the sum, differences, products, quotients, powers and roots of complex numbers.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Exponents and Radicals	5.1 Convert between fractional exponents and radicals. 5.2 Simplify expressions with fractional exponents. 5.3 Simplify radicals by removing perfect powers and by rationalizing the denominator. 5.4 Add, subtract, multiply, and divide radicals.
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Additional Topics in Trigonometry	6.1 Simplify a trigonometric expression using the fundamental identities. 6.2 Prove trigonometric identities using the fundamental identities. 6.3 Simplify expressions or prove identities using the sum, difference, double-angle, or half-angle formulae. 6.4 Solve trigonometric equations. 6.5 Evaluate inverse trigonometric functions.
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Plane Analytic Geometry	7.1 Write the equation of a circle, ellipse, parabola or hyperbola from given information. 7.2 Sketch a graph of any of the above conic sections.
Course Outcome 8	**Learning Objectives for Course Outcome 8**
8. Statistics	8.1 Organize data into frequency distributions, frequency histograms or frequency polygons. 8.2 Calculate the mean, median and mode for a set of data. 8.3 Calculate the range and standard of deviation for a set of data. 8.4 Recognize and describe types of correlation. 8.5 Explain the concept of the standard normal distribution and

	its importance for inference. 8.6 Calculate event probabilities based on transforming raw scores to z-scores.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight	Course Outcome Assessed
Tests	100%	

Date: June 25, 2018

Please refer to the course outline addendum on the Learning Management System for further information.