COURSE OUTLINE: MTH143 - MATHEMATICS

Prepared: Mathematics Department
Approved: Karen Hudson, Dean, Community Services and Interdisciplinary Studies

Course Code: Title	MTH143: MATHEMATICS
Program Number: Name	4026: ELECTRICAL TN-PROC
Department:	MATHEMATICS
Academic Year:	2023-2024
Course Description:	This course is a continuation of MTH142 for engineering technology students. Topics of study include vectors, oblique triangles, complex numbers, exponents and radicals, trigonometric functions and identities, exponential and logarithmic functions, plane analytic geometry, and an introduction to statistics.
Total Credits:	5
Hours/Week:	4
Total Hours:	56
Prerequisites:	MTH142
Corequisites:	There are no co-requisites for this course.
Substitutes:	MTH612, MTH613
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 A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Books and Required Resources:	Basic Technical Mathematics with Calculus (SI Version) Washington, SI Version by Washington and Boue Publisher: Pearson Edition: 11 ISBN: 9780134289915 or EBook 9780136963813 Calculator - Sharp EL-520XTB (available in the bookstore)

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Vectors and Oblique Triangles	1.1 Resolve a vector into its components. 1.2 Determine the resultant of two or more vectors using the polygon method, the parallelogram method, and adding by components. 1.3 Solve oblique triangles using the law of sines and the law of cosines. 1.4 Solve applied problems requiring oblique triangles.

Course Outcome 2	Learning Objectives for Course Outcome 2
2. Complex Numbers	2.1 Write complex numbers in rectangular, polar and exponential forms. 2.2 Graph complex numbers in rectangular form. 2.3 Find the sums, differences, products, quotients, powers and roots of complex numbers.

Course Outcome 3	Learning Objectives for Course Outcome 3
3. Exponents and Radicals	3.1 Convert between fractional exponents and radicals. 3.2 Simplify expressions with rational exponents. 3.3 Simplify radicals by removing perfect powers and by rationalizing the denominator. 3.4 Add, subtract, multiply, and divide radicals.

Course Outcome 4	Learning Objectives for Course Outcome 4
4. Graphs of Trigonometric Functions	4.1 Find the amplitude, period, frequency and phase angle for a sine wave or cosine wave. 4.2 Write the sine function or cosine function given the amplitude, period and phase. 4.3 Graph sine, cosine and tangent functions including those with compressions and translations. 4.4 Graph the basic inverse trigonometric functions without compressions or translations.

Course Outcome 5	Learning Objectives for Course Outcome 5
5. Trigonometric Identities and Solving Trigonometric Equations	5.1 Simplify a trigonometric expression using the fundamental identities. 5.2 Prove trigonometric identities using the fundamental identities. 5.3 Simplify expressions or prove identities using the sum, difference, double-angle, or half-angle formulae. 5.4 Solve trigonometric equations.

Course Outcome 6	Learning Objectives for Course Outcome 6
6. Exponential and Logarithmic Functions	6.1 Define the logarithmic and exponential function. 6.2 Graph logarithmic and exponential functions. 6.3 Convert expressions between exponential and logarithmic form. 6.4 Evaluate, manipulate and simplify logarithmic expressions. 6.5 Solve exponential and logarithmic equations.

Course Outcome 7	Learning Objectives for Course Outcome 7

	7. Plane Analytic Geometry	7.1 Calculate the distance between two points. 7.2 Calculate the slopes and inclinations of lines and describe orientation of lines relative to each other based on the slopes. 7.3 Write the equation of a line, circle, ellipse, parabola or hyperbola from given information. 7.4 Sketch graphs of lines or any of the conic sections noted above.
	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
Assignment	9%
Tests	91%

Date: January 2, 2024

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