COURSE OUTLINE: MTH613 - TECHNICAL MATHEMATIC

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

Course Code: Title	MTH613: TECHNICAL MATHEMATICS
Program Number: Name	4061: AVIATION TECHNOLOGY
Department:	MATHEMATICS
Academic Year:	2024-2025
Course Description:	The course includes topics in Plane Analytic Geometry, introduction to Calculus including derivatives and integration of algebraic functions, applications of integration.
Total Credits:	4
Hours/Week:	4
Total Hours:	56
Prerequisites:	MTH612
Corequisites:	There are no co-requisites for this course.
Substitutes:	MTH551
This course is a pre-requisite for:	MTH626
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.
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 by Washington and Boue Publisher: Pearson Edition: 11 ISBN: 9780134289915 Calculator - Sharp EL-520XTB (available in the bookstore)
Course Outcomes and Learning Objectives:	*(see table below)*

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Plane Analytic Geometry:	1.1 Understand basic concepts and use the distance formula, the midpoint formula, the slope formula. 1.2 Find the equation of a straight line using slope and y-intercept. Graph the line. 1.3 Define the circle, parabola, ellipse and hyperbola.

	1.4 Identify the conic section from the given equation. 1.5 From given information, find the equation of the conic section and make a graph.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. The Derivative:	2.1 State the conditions required for a function to be continuous. 2.2 Describe what a limit is and find the limit. 2.3 Write the definition of the derivative of a function. 2.4 Use the definition, find the derivative for a given function. 2.5 Find the derivative using the polynomial rule. 2.6 Find the derivative using the product rule, quotient rule and chain rule. 2.7 Differentiate implicit functions. 2.8 Find higher derivatives, using explicit and implicit functions.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Applications of the Derivative:	3.1 Find the tangent and normal equations at a given point. 3.2 Study formulas for curvilinear motion and determine the resultant velocity and acceleration. 3.3 Solve word problems involving related rates. 3.4 Analyse polynomial and rational functions and draw a sketch. 3.5 Solve word problems involving maximum or minimum values.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Integration:	4.1 Write a derivative in differential form. 4.2 Use rules of integration to find the integral of a polynomial function. 4.3 Define the definite integral and solve problems involving definite integrals. 4.4 Solve word problems involving velocity, acceleration and electric charge using the indefinite integral. 4.5 Find the area by integration under a curve and area between two curves. 4.6 Find the volume by rotation around a given axis. Use both the disk and shell method.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	15%
Quizzes	10%
Tests	75%

Date: October 4, 2024

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

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