COURSE OUTLINE: MTH654 - TECHNICAL MATHEMATIC

Prepared: Mathematics Department
Approved: Greg Farish, Dean, Aviation

Course Code: Title	MTH654: TECHNICAL MATHEMATICS
Program Number: Name	4061: AVIATION TECHNOLOGY
Department:	MATHEMATICS
Academic Year:	2023-2024
Course Description:	This course is a continuation of MTH626 and provides the student with a more advanced study of calculus. Topics of study include methods of integration, first and second order differential equations and series expansions.
Total Credits:	4
Hours/Week:	4
Total Hours:	56
Prerequisites:	MTH626
Corequisites:	There are no co-requisites for this course.
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 by Washington and Boue Publisher: Pearson Edition: 11 ISBN: 9780134289915 Calculator - Sharp EL-520XTB (available in the bookstore)

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Methods of Integration:	1.1 Use the General Power formula to integrate functions including transcendental integrands. 1.2 Integrate functions using the Basic Logarithmic form. 1.3 Integrate functions using the Exponential form. 1.4 Integrate functions using various trigonometric forms. 1.5 Integrate functions using the technique of integration by parts.

	1.6 Integrate functions using the technique of trigonometric substitutions. 1.7 Integrate functions using the technique of partial fractions. 1.8 Integrate functions using a table of integrals.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Expansion of Functions in Series:	2.1 Understand what an infinite series is and identify convergent and divergent series. 2.2 Use the Maclaurin Series to expand various functions. 2.3 Perform operations with known series to find new series. 2.4 Use the Taylor Series to expand various functions. 2.5 Use formulas for constants and coefficients to find Fourier Series expansions for functions
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Differential Equations:	3.1 Prove that a given equation is a solution of a given differential equation. 3.2 Use the method of Separation of Variables to solve differential equations. 3.3 Use the method of Integrating Combinations to solve differential equations. 3.4 Solve linear first order differential equations. 3.5 Solve problems in physics and technology involving first order differential equations. 3.6 Solve second order homogeneous differential equations. 3.7 Solve second order heterogeneous differential equations. 3.8 Solve problems in physics and technology involving second order differential equations. 3.9 Solve differential equations, including applications, using Laplace Transforms.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments/Quizzes/Attendance	30%
Tests	70%

Date: December 8, 2023

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