

MHZ4553 Engineering Mathematics III

Level	4
Course Code	MHZ4553
Course Title	Engineering Mathematics III
Credit value	5
Core/Optional	Core
Course Aim/s	To provide the knowledge in vector calculus, calculus of the complex functions, linear algebra, applied statistics, partial differential equations, numerical methods to solve Engineering problems.
Course Learning Outcomes (CLO):	<p>At the completion of this course student will be able to</p> <p>CLO1: Apply theorems and methods of calculus in the optimization problems</p> <p>CLO2: Use scalar and vector field operators to evaluate line integrals.</p> <p>CLO3: Integrate core principles, enabling them to analyze complex problems.</p> <p>CLO4: Apply linear matrix transformation techniques in problems related to projection and rotation</p> <p>CLO5: Solve linear systems of equations using linear transformations of vector spaces</p> <p>CLO6: Perform hypothesis tests for a population parameter, for single sample and two sample cases</p> <p>CLO7: Perform a correlation and a bi-variate regression analysis on given sets of data</p> <p>CLO8: Solve ordinary differential equations and partial differential equations by using analytical and numerical methods</p>
Content	<p>Outline Syllabus:</p> <p>Unit 1: Continuity and differentiability of functions of several variables</p> <p>Unit 2: Jacobians and implicit functions</p> <p>Unit 3: Theorems on several variables and applications</p> <p>Unit 4: Vector Calculus</p> <p>Unit 5: Analytic functions</p> <p>Unit 6: Elementary functions of complex variables</p> <p>Unit 7: Complex Integrals</p> <p>Unit 8: Diagonalization of Matrices and Quadratic Forms</p> <p>Unit 9: Vector spaces and Inner Product Spaces</p> <p>Unit 10: Applications of Statistics</p> <p>Unit 11: Statistical computing (R software)</p> <p>Unit 12: Series solutions of Linear Differential Equations</p> <p>Unit 13: Partial Differential Equations</p> <p>Unit 14: Numerical Methods for Solving ODEs and PDEs</p> <p>Computer Based Practical:</p> <p>Study of the estimation, hypothesis testing, simple regression analysis by using R software.</p>