

MHZ3552 Engineering Mathematics II

Level	3
Course Code	MHZ3552
Course Title	Engineering Mathematics II
Credit value	5
Core/Optional	Core
Course Aim/s	To provide the knowledge in vectors, algebra, probability and statistics, numerical methods, and hydrostatics to solve Engineering problems.
Course Learning Outcomes (CLO):	<p>At the completion of this course student will be able to</p> <p>CLO1: Explain and apply the basic concepts of descriptive statistics, probability and distribution theory to real life situations.</p> <p>CLO2: Compile and evaluate statistical reports.</p> <p>CLO3: Compute (Scalar Product, Vector Product and triple scalar product) and apply vectors to solve geometrical problems.</p> <p>CLO4: Solve dynamic problems using vectors and space curves.</p> <p>CLO5: Verify properties of complex numbers; apply D' Moivre's theorem to obtain trigonometric identities and compute the powers of the complex numbers.</p> <p>CLO6: Apply theorems of limits to determine the continuity of complex functions and illustrate the image of a complex mapping.</p> <p>CLO7: Solve non-linear equations, systems of linear equations, and compute derivatives and integrals using numerical methods.</p> <p>CLO8: Express differentiable functions in the form of a power series and Taylor series; use such expressions to obtain approximate solutions.</p> <p>CLO9: Express periodic functions as Fourier series and determine their convergence.</p> <p>CLO10: Solve first and higher order differential equations using analytical techniques including Laplace Transformations.</p> <p>CLO11: Solve system of linear equations and sketch complex functions using software tools.</p>
Content (Main topics, sub topics)	<p>Outline Syllabus:</p> <p>Unit 1: Introduction to Statistics Session 01: Definition of Statistics Session 02: Data Collection Session 03: Summarization and presentation of Data Session 04: Descriptive Analysis of data Session 05: Preparation of Statistical Reports</p> <p>Unit 2: Introduction to Probability Session 06: Basic Concepts of Probability Session 07: Conditional Probability</p> <p>Unit 3: Distribution Theory Session 08: Probability Distribution Session 09: Discrete Probability Distributions Session 10: Continuous Probability Distributions</p> <p>Unit 4: Vector Algebra Session 11: Basic Concepts of Vectors</p>

	<p>Session 12: Vector Products Session 13: Vector Equation of a Line and plane Unit 5: Vector Functions and space curves Session 14: Differentiation of Vector functions Session 15: Vector Applications of Dynamics Unit 6: Complex numbers Session 16: Algebra of Complex Numbers, Session 17: Argand Plane Session 18: De Mover's Theorem Unit 7: Function on Complex variables Session 19: Complex Function Session 20: Limits and continuity of a Complex Function Unit 8: Introduction to Numerical Methods Session 21: Scope of Numerical Computation & Error Calculations, Session 22: Methods of Solving Equations Session 23: Methods of Solving system of linear equations Session 24: Interpolation and Extrapolation Session 25: Numerical Differentiation and Integration Unit 9: Power Series Session 26: Power Series Session 27: Differentiation and integration of power series Unit 10: Fourier Series Session 28: Introduction to Fourier Series Session 29: Differentiation and Integration of Fourier Series Unit 11: Laplace Transform Session 30: Introduction to Laplace Transform Session 31: Solution of Differential Equations Using Laplace Transform Unit 12: Software Tools for Mathematics II Session 32: Finding the inverse matrix and determinant Session 33: Solving systems of linear Equations Session 34: Sketching the graphs of complex functions Computer Based Activity: Solving system of equations Sketching the graphs of complex functions and sketching the graph of complex function by using Software tools</p>
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