MHZ5554 Engineering Mathematics IV

Level	5
Course Code	MHZ5554
Course Title	Engineering Mathematics IV
Credit value	5
Core/Optional	Core
Course Aim/s	To provide the knowledge in vector integrations, conformal mapping, fourier transform, tensor calculus, statistical methods, and operations method and simulation techniques to solve complex Engineering problems.
Course Learning Outcomes (CLO):	At the completion of this course student will be able to: CLO1: Solve engineering problems by applying Greens, Stokes' and Divergence theorems. CLO2: Apply standard techniques to solve complex functions. CLO3: Apply Fourier transformation techniques to solve non-periodic functions. CLO4: Apply tensor calculus to derive moments of inertia, stresses and strains. CLO5: Apply statistical techniques to engineering problems and obtain a statistical conclusion. CLO6: Apply optimization techniques to engineering problems to find optimum or near optimum solutions. CLO7: Identify and apply simulation techniques and tools to find approximate solutions to engineering problems.
Content **(Main topics, sub topics)**	Unit 3: Conformal Mapping Session 6:Review of - Transformation Session 7:Applications of conformal mapping Session 8:Cross ratio (Bilinear Transformation) Unit 4:Fourier transforms Session 9:Fourier integral theorem Session 10:Fourier transform Session 11: Application of Fourier transform Unit 5: Tensor calculus Session 12 : Cartesian Tensors Session 13: Second and Higher Order Tensors: Session 14: Algebra of Cartesian Tensors: Session 15: The Moment of Inertia Tensor Unit 6: Statistical Methods Session 16: Design and analysis of experiments Session 17:Analysis of Variance (ANOVA) Session 18: Analysis of covariance Session 19: Introduction to statistical quality control Session 20: Introduction to time series analysis Session 21: software tools for statistical analysis Unit 7: Operations Research(OR) Session 22: Introduction to operations research Session 23: Linear Programming Session 24: Transportation model Session 25: Network model Session 26: Integer programming Session 27:Software tools for Operations research

	Unit 8: Simulations Session 28: Introduction to simulation Session 29: Simulation techniques Session 30:Generation of pseudo random variates Session 31: Generation of random variates Session 32: Software tools for Simulation **Computer Based Practicals:** 1. Use the software tools to solve problem using optimization and simulation techniques. 2. Use the software tools to analyze problems using statistical techniques.