NEHRU MEMORIAL COLLEGE
(AUTONOMOUS)

NATIONALLY ACCREDITED WITH "A" GRADE BY NAAC

PUTHANAMPATTI, TRICHY – 621007

DEPARTMENT OF MATHEMATICS

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COURSE OUTCOME (COS)

Name of the Course	Course Outcomes
Algebra	CO 1: Understand Solow's theorem and its applications and Galois theory and its applications CO 2: Apply suitable methods to find the roots of the polynomials CO 3: Analyze linear transformations. CO 4: Evaluate characteristic roots of the matrix
Real Analysis-I	CO1: Describe the concepts of sets and functions, metric spaces, continuity and connectedness. CO2: Demonstrate on sequences and series. CO3: Demonstrate on applying Baire Category Theorem, Banach Contraction Principle . CO4: Analyze Cauchy sequences, complete metric spaces and connected metric spaces.
Ordinary Differential Equations	CO1: Describe the methods of solving first and second order ODE and non linear autonomous system of ODE. CO2: Understand the special functions of Mathematical Physics and the concept of stability and critical points of linear system of equations. CO3: Evaluate the power series solution of ODE. CO4: Demonstrate on applying Picard's theorem to find the solution of ODE's.

Integral Equation, Calculus of Variations and Fourier Transforms	CO1: Solve the linear integral equations CO2: Find the solutions of Volterra and Fredholm integral equations. CO3: Demonstrate on variational problems on moving boundaries and fixed boundaries. CO4: Find the Fourier transform and Hankel transform of various functions.
Classical Dynamics	CO 1: Understand the 3N-Coordinate system made up of N-Spatial coordinates, N-velocity coordinates and N-acceleration coordinates CO 2: Analyze the motion of mechanical systems with constraints using Lagranian description CO 3: Apply Hamilton's principle and gain proficiency in solving equations of motions CO 4: Use the Hamilton-Jacobi theory in solving equations of options
Linear Algebra	CO 1: Apply the knowledge of bases and dimension of vector spaces and linear transformation. CO2: Understand the operations on matrices, matrix of linear transformation and properties of determinant. CO3: Evaluate the Eigen values and the Eigen vectors of linear transformations. CO4: Demonstrate on applying the Jordan canonical forms to vector paces.

Real Analysis-II	CO1: Know differentiation of single variables. CO2: Acquire the knowledge of Riemann-Stieltjes integrals and inverse function theorem CO3: Demonstrate on the convergence and uniform convergence of sequence and series of functions CO4: Evaluate directional derivative, total derivative, Jacobian of functions of several variables.
Topology	CO1: Develop their abstract thinking skills CO2: Provide precise definitions and appropriate examples and counter examples of fundamental concepts in general topology. CO3: Acquire knowledge about various types of topological spaces and their properties CO4: Appreciate the beauty of the mathematical results like Ury Zohn's Lemma and understand the dynamics of the proof techniques.
Partial Differential Equations	CO1: Recollect the first order and second order partial differential equations and their solution. CO2: Understand the linear partial differential equations with constant and variable coefficients, boundary value problems and application of calculus of variations. CO3: Gain good knowledge in applying Charpit's and Jacobi's methods, method of separation of variables and the method of integrals to obtain solutions of partial differential equations. CO4: Demonstrate on the canonical forms of second order PDEs and bounded value problems by Dirichlet and Neumann.

Complex Analysis	CO1: Acquire the knowledge of analytic functions and Mobius transformation. CO2: Understand the concept of complex integration. CO3: Demonstrate on Cauchy theorems and open mapping theorem. CO4: Classify the singularities and evaluate the residue
Differential Geometry	CO1: Understand the concept of Graphs and Level sets-Vector fields CO2: Analyze surfaces and Vector field on surfaces CO3: Understand Gauss map-Geodesics. CO4: Apply Parallel Transport and Weingarten map.
Measure Theory and Integration	CO 1: Acquire the concept of Lebesgue measure, measurable set. CO 2: Understand the concept of integration of non negative functions. CO 3: Demonstrate on Jenson's inequality and Hahn decomposition theorem and Fubini's theorem. CO 4: Analyze the properties of L^p spaces.
Functional Analysis	CO1: Understand the concept of Normed Spaces CO2: Apply the idea of linear operators and compact operators CO3: Evaluate Ortho normal basis CO4: Eemonstrate spectral theory
Stochastic Processes	CO1: Understand the concept of various specifications o Stochastic Processes. CO2: Apply the idea of Markov chain and Markov Processes to real life problems. CO3: Demonstrate on renewal equation, stopping time and renewal theorem. CO4: Apply the idea of queuing model to real life problems

Number Theory	CO1: Attain a broad understanding of divisibility, congruence, greatest common divisor, least common multiple and factoring. CO2: Understand certain number theoretic functions and their properties. CO3: Apply the law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues and quadratic non- residue. CO4: Acquire the mathematical skills required to solve the system of Diophantine equation using Chinese Reminder theorem and Euclidean algorithm.
Fuzzy Mathematics	CO1: To know the basic Mathematical elements of the theory of fuzzy sets CO2: Gain Knowledge about the fuzzy arithmetic and fuzzy number CO3: To understand the difference and similarities between fuzzy sets and classical set theories. CO4: Apply the fuzzy logic in real life situation
Graph Theory	CO1: Understand the definitions namely, cut vertex, bridge, blocks and automorphism group of a graph CO2: Study the properties of trees and connectivity. CO3: Identify Eulerian graphs and Hamiltonian graphs. CO4: Understand the concepts planarity including Euler identity, matching's and colorings.

Numerical Analysis	CO1: Obtain the solutions of transcendental and polynomial equations. CO2 : Apply direct methods and iteration methods for solving system of equations. CO3 : Apply Hermit interpolation, piecewise and spine interpolation. CO4 : Solve problems using interpolation and ordinary differential equations using numerical methods.
Optimization Techniques	CO1: Understand the concept of integer programming and dynamic programming. CO2: Analyze the problems based on decision theory and game theory. CO3: Get optimize inventory models. CO4: Evaluate non-linear programming problems.
Probability Theory	CO1: Acquire the knowledge of random variables, distribution. CO2: Understand the concept of expectation, characteristics function. CO3: Demonstrate on Chebyshev inequality and various distributions CO4: Apply limit theorems to analyze stochastic convergence.
Coding Theory	CO1: Apply linear block codes for error deduction and correction. CO2: Understand the importance in the design of codes. CO3: Apply the tools of linear algebra to construct special type of codes. CO4: Use algebraic techniques in designing coefficient and reliable data transmission methods.

Fluid Dynamics	CO1: Understand the behavior of fluids in motion. CO2: Understand the potential theorems of fluid flow CO3: Apply the concept of complex analysis in the analysis of the flow of liquids. CO4: Analyze the concept of sources, sinks & doublets and two dimensional flows.
Mathematical Modeling And Simulation	CO 1: Acquire the role of discrete and continuous distributions in simulation CO 2: Understand the steady state behavior of queuing models CO 3: Evaluate the performance measures of queuing system CO 4: Demonstrate on random number and variety generation
Statistics	CO 1: Represent data diagrammatically CO 2: Evaluate measures of dispersion CO 3: Apply correlation and regression analysis CO 4: Demonstrate on analysis of variance