DEPARTMENT OF MATHEMATICS

Programme Specific Outcomes (PSOs) – M. Sc Mathematics Programme

PSO1:	Understand the nature of abstract mathematics and explore the concepts in further details.
PSO2:	To assimilate complex mathematical ideas and arguments.
PSO3:	Provide advanced knowledge on topics in pure mathematics, empowering the students to pursue higher degrees at reputed academic institutions.
PSO4:	Good understanding of number theory which can be used in modern online cryptographic technologies
PSO5:	Comprehend and write effective reports and design documentation related to mathematical research and literature, make effective presentations
PSO6:	Assist students in preparing (personal guidance, books) for competitive exams e.g. NET, GATE, etc.

Course outcomes

SEMESTER	COURSE CODE	COURSE NAME		COURSE OUTCOMES
1	MTH1CO1	ALGEBRA -I	CO1:	Concept of group action and theorems about group actions.
			CO2:	Ability to understand a large class of commutative rings by regarding them as quotients of polynomial rings by suitable ideals.
			C03:	Provide information on ideals and Quotient rings, Field of Quotient of an integral domain.
			C04:	To introduce field extensions and Construction of finite fields

1	MTH1CO2	LINEAR ALGEBRA	CO1:	Vector theory: subspace, basis, linear independence, inner product spaces etc
			CO2:	Discuss Algebra of Linear Transformations and Characteristics roots
			C03:	Finding the eigenvalues and eigenvectors of linear transformations
			C04:	Explains canonical forms and inner product space
1	MTH1CO3	REAL ANALYSIS 1	CO1: CO2:	Basic idea of metric spaces, examples and the connected set Students should be able to illustrate the effect of uniform convergence on the limit function with respect to boundedness, continuity, differentiability and integrability
			C03:	Learn the theory of Riemann-Stieltjes integrals, to be acquainted with the ideas of the total variation and to be able to deal with functions of bounded variation.
			C04:	After completing the course, the student should be able to recognize, understand and apply concepts and methods in advanced real analysis.
1	MTH1C04	NUMBER THEORY	CO1:	Understand the concepts of divisibility and Primes and Solve congruences.
			CO2:	Solve the average arithmetic functions and some elementary theorems

			C03:	Describe briefly the cryptography and some keys
1	MTH1C05	DISCRETE MATHEMATICS	CO1:	Understand the definitions namely, cut vertex, bridge, blocks and Automorphism group of a graph.
			CO2:	Study the properties of trees and connectivity and Identify Eulerian graphs and apply results to identify Hamiltonian graphs.
			C03:	Study the basic concepts of automata theory
2	MTH2C06	ALGEBRA -II	CO1:	Explain Sylow theorem and its applications.
			CO2:	Explains the Automorphism of fields and the splitting fields
			C03:	To introduce field extensions CO8 Discussion of Galois theory
2	MTH2C07	REAL ANALYSIS II	CO1: CO2:	Measurable sets and Lebesgue measure, construction of non-measurable sets. Lebesgue integration, convergence theorems for Lebesgue integrals and Fubini's theorem.
			C03:	To introduce measure theoretic integration
			C04:	Deciding under which conditions the fundamental theorem of calculus is applicable in the context of Lebesgue integration.
2	MTHC08	TOPOLOGY	CO1:	Introducing topology as a generalization of metric spaces

			CO2:	Know the definition and basic properties of connected spaces, path connected spaces, compact spaces, and locally compact spaces;
			C03:	To introduce the peculiarities of compactness and connectedness in different spaces
			C04:	Explains the separation axioms and the product topology
2	MTH2C09	ODE AND CALCULUS OF VARIATION	CO1:	Obtain solutions of the Homogeneous equation with constant co-efficient and Homogeneous equation with analytic co-efficient.
			CO2:	Introduction to calculus of variation and the existence of solution
			C03:	Solution of first order differential equations
2	MTH2C10	OPERATIONS RESEARCH	CO1:	Analyze Graphical Method, Use of Artificial variables and Inverting a Matrix using Simplex method.
			CO2:	Understand Test the optimality for Degeneracy by using Transportation Algorithms (MODI method).
			C03:	Study Assignment Problem and its applications.
3	MTH2C11	MUTIVARIABLE CALCULUS AND GEOMETRY	CO1:	Impart basic knowledge of differentiation and integration in n-dimensional Euclidean space.
			CO2:	To get an idea of application of real analysis in geometry
			C03:	Understand Gauss Map-Geodesics and Apply Parallel Transport and Weingarten map

			C04:	Study the concept of Curvature of plane curves and surface
3	MTH3C12	COMPLEX ANALYSIS	CO1:	Introduce complex integration to understand analytic functions in a better way.
			CO2:	Solve the problems using complex analysis techniques applied to different situations in engineering and other mathematical contexts.
			C03:	Establish the capacity for mathematical reasoning through analysing, proving and explaining concepts from complex analysis
			C04:	Understanding of topological and geometric properties of the complex plane.
3	MTH3C13	FUNCTIONAL ANALYSIS	CO1:	Concept of normed linear spaces and inner product spaces and the bounded linear operators between these spaces.
			CO2:	Study Continuous linear transformations and the Hahn-Banach theorem.
			C03:	Understand the relevance of Operator Theory.
			C04:	The learner will be able to understand and apply fundamental theorems from the theory of linear operator

3	MTH3C14	PDE AND INTEGRAL EQUATIONS	CO1: CO2:	To introduce Partial differential equations for solving real life situations. Analyze the origin of first order partial differential equations and solving them using Charpit's method.
			C03:	Understand the formation and solution of some significant PDEs like wave equation, heat equation and diffusion equation.
			C04:	Introduction to integral equations and Newman series
3	MTH3E01	CODING THEORY	CO1:	Understand the concept of Maximum-Likelihood Decoding and Syndrome Decoding.
			CO2:	Analyze Double Error-Correcting B.C.H. code and Finite Fields Polynomials
			C03:	Study the concept of Bose-Chaudhuri-Hocquenghem (B.C.H.) Codes and Weight distributions
4	MTH4C15	ADVANCED FUNCTIONAL ANALYSIS	CO1:	Understand and apply fundamental theorems from the theory of normed spaces, including the Uniform Boundedness theorem, the open mapping theorem, the closed graph theorem, and the Banach Fixed Point theorem.
			CO2:	Have a good grasp of the spectral properties of various operators such as Compact Linear Operators, Self-adjoint linear operators, Positive Operators and Projection Operators.

			C03:	Understand and apply ideas from spectral theory to other mathematical contexts and related areas
4	MTH4E06	ALGEBRAIC NUMBER THEORY	CO1:	Deals with the basic concepts of modules and quadratic fields
			CO2:	Explains the factorization of polynomials
			C03:	Understand lattices, factorization of a rational primes, Fermat's last theorem
4	MTH4E09	DIFFERENTIAL GEOMETRY	CO1:	Understand the concept of Graphs and Level Sets-Vector fields.
			CO2:	Analyze Surfaces and Vector field on surfaces And Understand Gauss Map-Geodesics.
			C03:	Apply Parallel Transport and Weingarten map and Study the concept of Curvature of plane curves and surface
4	MTH4C11	GRAPH THEORY	CO1:	Write precise and accurate mathematical definitions of objects in Graph theory
			CO2:	To introduce connectivity, colouring and the concept of planarity
			C03:	Discuss and understand the importantance of the concepts Matchings and Colourings.