

DEPARTMENT : MATHEMATICS

Programme: B.Sc Mathematics

Programme Outcomes

Students who have completed a degree in B.Sc Mathematics should be able to

- PO1 Use their Mathematical Knowledge to solve problems
- PO2 Undertake further studies related to Mathematics
- PO3 Get employment utilizing their mathematical Knowledge like Teaching Jobs, Banks, etc

Programme Specific Outcomes

Graduates of the degree will have the capacity to:

- PSO1 Ability to represent and utilize mathematical concepts in various ways.
- PSO2 Apply mathematical methodologies to open-ended real-world problems
- PSO3 Recognize real-world problems that are amenable to mathematical analysis, and formulate Mathematical models of such problems
- PSO4 Apply mathematical methods involving arithmetic, algebra, geometry, and graphs to solve Problems.
- PSO5 Facility with technology to deepen mathematical understanding and to enhance problem solving Skills.

Course Outcomes

Class	Course Code	Outcomes
I B.Sc	CO1	Students get knowledge of Theory of Equations, Summation of Series, Matrices, Continued Fractions and Elementary Number Theory.
	CO2	This covers topics on the expansions of trigonometric functions, hyperbolic functions, inverse circular, inverse hyperbolic functions and it develops computational skills.
	CO3	Students get knowledge of Finite differences, Central differences, Inverse interpolation, Summation of series, Interpolation for equal & unequal intervals, Solutions of simultaneous equations, Important principles, Method and Processes to get numerical results, Reliability of numerical result.
	CO4	Students learn the fundamental principles, concepts and knowledge in the areas of Differential and Integral Calculus. This prepares the students to apply these fundamental concepts and working knowledge to other courses.
	CO5	Students get deepen knowledge in various concepts of Analytical Solid Geometry
	CO6	Gain knowledge about the techniques of Numerical Differentiation and Numerical Integration. It also deals with solution of difference equations, Algebraic and Transcendental equations and Numerical solution of Ordinary differential equations of first order
II B.Sc	CO7	Students get logical skills in the formation of differential equations, to

		expose to different techniques of finding solutions to these equations and in addition stress is laid on the application of these equations in geometrical and physical problems.
	CO8	Students are able to apply Statistical methods for Mathematical problem
	CO9	Students improve the skills of solving very common problems which we come across in various fields like transportation, games and industries with machines.
	CO10	Gain knowledge about vector and tensor calculus which are essential tools of modern applied mathematics. They develop deep understanding of key concepts followed by problems of applied nature. The portion on Fourier analysis will lead to post-graduate studies and research in pure as well as applied mathematics.
	CO11	Student's are able to apply Statistical methods for Mathematical problem
	CO12	Student's gain the knowledge about concepts of mathematics with emphasis on analytical ability and computational skill needed in competitive examinations.
III B.Sc	CO13	Gain knowledge about concepts and technology of the groups and rings as these algebraic structures have applications in Mathematical Physics, Mathematical Chemistry and Computer Science.
	CO14	Understands the various limiting behavior of sequences and series and explores the various limiting processes viz. continuity, uniform continuity, differentiability and integrability and to enhance the mathematical maturity and to work comfortably with concepts.
	CO15	This course provides a modern treatment of concepts and techniques of complex function theory and gain knowledge about the complex number system, the complex function and complex integration.
	CO16	This course introduces the students the basic concepts of forces, moments, couple, friction law virtual displacement and work, catenary and the centre of gravity and kinematics. This course stresses the development of skills in formation of suitable mathematical models and problems solving techniques.
	CO17	Able to Understands the dynamic changes in the body under the action of forces and gain knowledge about Projectiles, Central Orbits, Moment of Inertia and mathematical formulation of the physics aspects of the problems and it develops logical deduction and interpretation.
	CO18	Understands the concepts of graphs, subgraphs, trees connectivity, Eulerian and Hamiltonian graphs.
	CO19	Gain the knowledge about Chain rule – Time and work, Time and Distance, Problems on Trains, Boats and Streams, Allegation or Mixture
	CO20	Understand the concepts of vector spaces, subspaces, bases, dimension and their properties and about Linear Transformation.
	CO21	Understands the Integration process of Riemann

		And develop the knowledge about point wise and uniform convergence of sequence and series of functions..
	CO22	Gain knowledge about complex Integration and series. This course provides methods to solve problems in pure as well as in applied mathematics.
	CO23	Develops the computational skill and logical thinking in formulating industry oriented problems as a mathematical problem and finding solutions to these problems.
	CO24	Gain knowledge about the fundamentals of fuzzy Algebra, basic definitions of fuzzy theory and the applications of fuzzy Technology
	CO25	It develops the knowledge about Simple Interest, Compound Interest, Logarithms – Races and Games of Skill, Area Volume and surface areas.

Programme: M.Sc Mathematics

Programme Outcomes

Students who have completed a degree in M.Sc Mathematics should be able to

- PO1 Prepare Students for Pursuing research or Careers in industry in Mathematical Sciences.
- PO2 Able to design the methodology Suitable to the Problem encountered.
- PO3 Continue to acquire relevant Knowledge and Skills appropriate to Professional activities and demonstrate highest standards of ethical issues in Mathematical Sciences.

Programme Specific Outcomes

Graduates of the degree will have the capacity to:

- PSO1 Evaluate hypotheses, theories, methods and evidence within their proper contexts
- PSO2 Develop proficiency in the analysis of complex physical problem and the use of mathematical or Other appropriate techniques to solve them
- PSO3 Qualify national level tests like NET/GATE etc.
- PSO4 Pursue research in challenging areas of pure/applied mathematics
- PSO5 Facility with technology to deepen mathematical understanding and to enhance problem solving Skills.

Course Outcomes

Class	Course Code	Outcomes
I M.Sc	C01	Students develop working knowledge on class equation, finite abelian groups, linear transformations, real quadratic forms.
	C02	Work comfortably with functions of bounded variation, Riemann-Stieltjes Integration, convergence of infinite series, infinite product and uniform convergence and its interplay between various limiting operations.
	C03	Students develops strong background on finding solutions to linear differential equations with constant and variable coefficients and also with singular points, to study existence and uniqueness of the solutions of first order differential equations.

II M.Sc	C04	Students get knowledge of space curves and their intrinsic properties of a surface and geodesics. Further the non-intrinsic properties of surfaces are explored.
	C05	Students get knowledge of concepts of graphs, subgraphs, trees, connectivity, Euler tours, Hamilton cycles, matching, coloring of graphs, independent sets, cliques, vertex coloring, and planar graphs
	C06	Identify and analyze different types of algebraic structures such as Algebraically closed fields, Splitting fields, roots of polynomials, Galois Theory, finite fields, division rings, solvability by radicals Finite field extensions to understand and use the fundamental results in Algebra.
	C07	Understand the nature of measure on the real line, Lebesgue measurability and integrability, Fourier Series and Integrals. Extend their knowledge of Lebesgue theory of integration by selecting and applying its tools for further research in this and other related areas.
	C08	Understand partial differential equations of first order (linear and nonlinear), second and higher order. Apply the knowledge of PDEs and their solutions in order to understand physical phenomena.
	C09	Understand mechanical systems under generalized coordinate systems, virtual work, energy and momentum, and gain knowledge about mechanics developed by Newton, Langrange, Hamilton Jacobi and Theory of Relativity due to Einstein.
	C010	Gain knowledge about concept of calculus of variation and its applications and second to introduce various types of integral equations and how to solve these equations.
	C011	Evaluate complex integrals and apply Cauchy integral theorem and formula and evaluation of definite integral and harmonic functions
	C012	Understand the concepts of topological spaces and the basic definitions of open sets, neighbourhood, interior, exterior, closure and their axioms for defining topological space. Understand continuity, compactness, connectedness, countability, separation axioms homeomorphism and topological properties..
	C013	Gain knowledge about decision theory, PERT, CPM, deterministic and probabilistic inventory systems, queues, replacement and maintenance problems.
II M.Sc	C014	Understand the concepts of axiomatic approach to probability theory, study some statistical characteristics, discrete and continuous distribution functions and their properties, characteristic function and basic limit theorems of probability
	C015	It provides the knowledge about vector algebra and vector calculus and special relativity and relativistic kinematics, dynamics and accelerated systems.
	C016	Understand the concepts of Riemann Theta Function and normal families, Riemann mapping theorem, Conformal mapping of polygons, harmonic functions, elliptic functions and Weierstrass Theory of analytic continuation.
	C017	Understand and apply fundamental theorems from the theory of normed and Banach spaces including the Hahn-Banach theorem, Hilbert Spaces, the open mapping theorem, the closed graph theorem, uniform boundedness theorem and Banach algebras.

	C018	This course introduces sampling theory, significance tests ,estimation, testing of hypotheses, ANOVA and sequential analysis with rigorous mathematical treatment.
	C019	Understand the process of discretization, Discrete version of Differential Equations, Discrete oscillation and the asymptotic behavior of solutions of certain class of difference equations for linear cases only. Solution of difference equations using z transforms is stressed.
	C020	Apply the knowledge of Number theory and Cryptography to attain a good mathematical maturity and enables to build mathematical thinking and skill. Utilize the congruence's, Chinese remainder theorem, indices, residue classes, Legendre symbols to solve different related problems.

Programme: M.Phil Mathematics

Programme Outcomes

Students who have completed a degree in M.Phil Mathematics should be able to

- PO1 Students are gaining research knowledge in pure and applied mathematics.
- PO2 Ability to formulate hypothesis, design theoretical or/and computational model and perform scientific simulations to solve and explain observed phenomena
- PO3 Visualize and work on laboratory multidisciplinary tasks related to current research in the fields of Mathematical, Physical and Life sciences

Programme Specific Outcomes

Graduates of the degree will have the capacity to:

- PSO1: Ability to write research articles in mathematics and to publish it in reputed journals.
- PSO2: Develop and enhance teaching skills in mathematics
- PSO3: Enables the students to obtain advanced knowledge in a specialized field.

Course Outcomes

Class	Course Code	Outcomes
M.Phil	C01	Gain knowledge of the theory of semi simple algebras. Investigate the properties of modules and appreciate its important results Apply appropriate techniques of integration to product spaces. Evaluate problems in product spaces using the powerful concept of integration.
	C02	Understands the connection between covering spaces and fundamental group. Construct the fundamental group of a topological space.