

Program Specific Outcomes (PSOs) for B.Sc. Mathematics:

PSO 1:

Apply mathematical concepts, analytical reasoning, and problem-solving techniques to model and solve real-life and interdisciplinary problems.

PSO 2:

Develop proficiency in logical thinking, quantitative analysis, and the use of mathematical tools for higher studies, research, and professional careers.

B.SC MATHEMATICS-(CBCS) SEMESTER-I

Name of the Course	Differential & Integral Calculus
Course Code	149

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand and Apply the Concepts of Functions of Two Variables	Understand, Apply	L2, L3
CO2	Analyze Total Differentiation and Composite Functions	Analyze	L4
CO3	Evaluate Curvature, Evolutes, and Envelopes of Curves	Evaluate	L5
CO4	Compute Lengths, Volumes, and Surfaces Using Integral Calculus	Apply, Analyze	L4, L5
CO5	Synthesize and Solve Real-world Problems Involving Multivariable Calculus	Evaluate, Create	L5, L6

B.SC MATHEMATICS-(CBCS) SEMESTER-II

Name of the Course	Differential Equations
Course Code	249

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand and solve first-order, first-degree differential equations including separable, homogeneous, linear, and exact types; use integrating factors and variable transformations effectively.	Remember, Understand, Apply	L1, L2, L3
CO2	Analyze and solve first-order but higher-degree differential equations; identify the type (solvable for p, x, or y) and solve practical problems involving growth, decay, radioactivity, and orthogonal trajectories.	Apply, Analyze	L3, L4
CO3	Solve higher-order linear differential equations with constant coefficients using operator methods and method of undetermined coefficients for various forms of Q(x).	Apply, Analyze	L3,L4
CO4	Apply the method of variation of parameters and solve linear differential equations with variable coefficients including Cauchy-Euler and Legendre's equations.	Apply, Analyze	L3,L4
CO5	Form and solve basic partial differential equations; apply integrable forms and solve linear PDEs of the first order.	Understand, Apply	L2,L3

B.SC MATHEMATICS-(CBCS) SEMESTER-III

Name of the Course	Real Analysis
Course Code	349

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand and apply the concept of limits and convergence of sequences, use limit theorems, and classify monotone, Cauchy, and bounded sequences; compute \limsup and \liminf ; analyze series using tests.	Understand, Apply, Analyze	L2, L3,L4
CO2	Demonstrate continuity and uniform continuity; analyze properties of continuous functions and compute limits of functions.	Apply, Analyze	L3,L4
CO3	Apply and analyze the derivative and its properties; use the Mean Value Theorem, L'Hôpital's Rule, and Taylor's Theorem to evaluate limits and approximate functions.	Apply, Analyze,	L3, L4
CO4	Understand and evaluate Riemann integrals; apply properties of integration and Fundamental Theorem of Calculus to solve problems.	Understand, Apply, Evaluate	L2,L3,L6
CO5	Integrate concepts from sequences, continuity, differentiation, and integration to formulate and solve advanced real analysis problems and proofs.	Analyze, Evaluate, Create	

B.SC MATHEMATICS-(CBCS) SEMESTER-IV

Name of the Course	Algebra
Course Code	449

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand the definition, notation, and basic properties of groups and subgroups; identify and classify cyclic groups and their subgroups.	Remember, Understand, Apply	L1,L2 & L3
CO2	Apply and analyze permutations, isomorphisms, Cayley's theorem, cosets, and Lagrange's Theorem; interpret group structures through geometric examples like rotation groups.	Apply, Analyze,	L2, L3
CO3	Examine normal subgroups and factor groups; understand and apply group homomorphisms and the First Isomorphism Theorem. Introduce and classify rings and integral domains.	Apply, Analyze	L2,L3
CO4	Analyze ideals and factor rings; identify and differentiate between prime and maximal ideals; understand and apply ring homomorphisms and their properties.	Analyze, Evaluate	L4,L6
CO5	Synthesize group and ring theory concepts to explore structural properties and solve abstract algebra problems in both theoretical and applied contexts.	Analyze, Evaluate, Create	L4, L5, L6

B.SC MATHEMATICS-(CBCS) SEMESTER-V

Name of the Course	Linear Algebra
Course Code	549

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand the structure of vector spaces and subspaces; analyze null spaces, column spaces, linear transformations, and determine bases and dimensions of vector spaces.	Remember, Understand, Apply	L1,L2,L3
CO2	Compute the rank of matrices, perform change of basis, and determine eigenvalues and eigenvectors using the characteristic equation.	Apply, Analyze	L3,L4
CO3	Diagonalize matrices and analyze linear transformations using eigenvectors; explore complex eigenvalues and apply the theory to solve differential equations.	Apply, Analyze, Evaluate	L3,L4,L6
CO4	Understand inner products, orthogonality, and apply orthogonal projections; use the Gram-Schmidt process to construct orthonormal bases and solve least squares problems.	Understand, Apply, Evaluate	L2,L3,L6
CO5	Integrate concepts of vector spaces, transformations, eigenvalue theory, and orthogonality to solve real-world problems and construct mathematical models.	Analyze, Evaluate, Create	L3,L5,L6

B.SC MATHEMATICS-(CBCS) SEMESTER-VI

Name of the Course	Integral transform
Course Code	649

Course Outcomes (COs)

CO No	Course Outcome Statement	Bloom's Level	Level Code
CO1	Understand the definition and conditions for the existence of Laplace transforms; compute transforms of derivatives, integrals, periodic, and special functions.	Remember, Understand, Apply	L1,L2,L3
CO2	Apply and analyze inverse Laplace transforms using standard methods, convolution theorem, and Heaviside's expansion formula.	Apply, Analyze	L3,L4
CO3	Solve ordinary and simultaneous differential equations and apply Laplace transforms to partial differential equations.	Apply, Analyze, Evaluate	L3,L4,L5
CO4	Understand and compute Fourier sine, cosine, and general Fourier transforms; apply inverse transforms to reconstruct functions.	Understand, Apply	L1,L3
CO5	Integrate concepts from Laplace and Fourier analysis to model and solve real-world problems in science and engineering using integral transforms.	Analyze, Evaluate, Create	L4,L5,L6