DUMKAL COLLEGE

Department of Mathematics

Program Outcome & Course Outcome of 3 - Year B.Sc. (Honours) in MATHEMATICS

(Under CBCS)

Program Outcome (PO)	Description
Mathematical Knowledge and Skills	Demonstrate a comprehensive understanding of fundamental mathematical concepts, techniques, and applications.
Critical Thinking and Problem Solving	Develop logical reasoning and problem-solving skills for theoretical and real-world problems.
Research and Innovation	Foster aptitude for research in mathematics with interdisciplinary approaches and innovative solutions.
Ethics and Sustainability	Cultivate ethical practices and promote the sustainable use of mathematical knowledge in societal development.
Communication and Collaboration	Enhance skills for effectively communicating mathematical ideas and working collaboratively in diverse settings.
Lifelong Learning	Prepare for lifelong learning and adaptability to evolving mathematical tools and technologies.
Employability and Higher Education Readiness	Equip students with analytical and computational skills for careers and advanced studies.

Semester	Course Code	Course Title	Course Outcome (CO)
I	MATH-H-CC-T-01	Calculus & Analytical Geometry	• Understand hyperbolic functions, curvature, asymptotes, and curve tracing. • Apply reduction formulas and geometry of conics.
	MATH-H-CC-T-02	Algebra	• Explore complex numbers, polynomial equations, groups, and matrix operations.
II	MATH-H-CC-T-03	Real Analysis	• Develop knowledge of limits, sequences, series, and convergence criteria.
	MATH-H-CC-T-04	Differential Equations	• Solve ordinary and partial differential equations, and analyze stability and phase plane behavior.
III	MATH-H-CC-T-05	Theory of Real & Vector Functions	• Study limits, continuity, differentiability, and vector calculus.
	MATH-H-CC-T-06	Group Theory-I	• Learn subgroup properties, Lagrange's theorem, and isomorphism theorems.
	MATH-H-CC-T-07	Numerical Methods	• Apply numerical techniques for interpolation, differentiation, integration, and solving equations.
	MATH-H-SEC-T-1A/B	Programming in 'C'	• Develop basic programming skills to solve mathematical problems.
		Python	
IV	MATH-H-CC-T-08	Ring Theory & Linear Algebra	• Understand ring properties, vector spaces, basis, eigenvalues, and eigenvectors.
	MATH-H-CC-T-09	Multivariate Calculus & Tensor Analysis	• Extend calculus to multiple variables, integration techniques, and tensor operations.
	MATH-H-CC-T-10	Linear Programming & Game Theory	• Formulate and solve optimization problems and analyze strategies in game theory.
	MATH-H-SEC-T-2A/B	Logic & Boolean Algebra	• Apply Boolean algebra to logic circuits.
		Graph Theory	• Analyze properties and algorithms of graphs.
V	MATH-H-CC-T-11	Riemann Integration & Series of Functions	• Explore Riemann integration, convergence tests, and Fourier series.

	MATH-H-CC-T-12	Mechanics-I	• Analyze motion, energy conservation, and laws of planetary motion.
	MATH-H-DSE-T-01	Group Theory-II	• Extend group theory concepts, automorphisms, and abelian groups.
		PDEs & Laplace Transforms	• Solve partial differential equations and Laplace transforms.
	MATH-H-DSE-T-02	Number Theory	• Analyze divisibility, congruences, and modular arithmetic.
		Differential Geometry	• Understand curves and surfaces in differential geometry.
VI	MATH-H-CC-T-13	Metric Spaces & Complex Analysis	• Study metric space properties and analyze functions of complex variables.
	MATH-H-CC-T-14	Probability & Statistics	• Develop an understanding of probability theory and statistical inference methods.
	MATH-H-DSE-T-03	Fuzzy Set Theory	• Understand fuzzy logic concepts for uncertainty modeling.
		Bio-Mathematics	• Explore mathematical techniques for biological systems.
	MATH-H-DSE-T-04	Point Set Topology	• Learn topological spaces and continuity.
		Mechanics-II	• Extend mechanics concepts to rigid body motion and central orbits.