

DUMKAL COLLEGE
Department of Mathematics
Program Outcome & Course Outcome of 4 - Year B.Sc. (H/H.& R.) in
MATHEMATICS
(Under NEP 20)

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)
Semester I	MATH-M-T-01	Calculus & Analytical Geometry	- Develop proficiency in fundamental concepts of calculus such as limits, continuity, derivatives, and integrals. - Analyse and interpret geometric properties of curves in two and three dimensions. - Apply calculus to solve real-world problems and model physical phenomena.
	MATH-SEC-T-01	Logic & Boolean Algebra	- Understand basic principles of mathematical logic and truth tables. - Gain insights into Boolean algebra and its applications in circuit design and digital systems.
Semester II	MATH-M-T-02	Algebra-I	- Gain a strong foundation in group theory, rings, and fields. - Explore algebraic structures for advanced applications in mathematics and physics.
	MATH-SEC-T-02	Fuzzy Set Theory	- Understand the concept of fuzzy sets and their significance in uncertainty Modeling. - Apply fuzzy set theory to solve problems in control systems, decision-making, and artificial intelligence.
Semester III	MATH-M-T-03	Real Analysis-I	- Study the rigorous development of real numbers and the properties of sequences and series. - Develop critical thinking to approach convergence and related concepts.
	MATH-SEC-T&P-03	Programming in C (Theory & Practical)	- Gain a working knowledge of programming in C. - Apply algorithms to solve mathematical problems programmatically.
Semester IV	MATH-M-T-04	Differential Equations	Solve ordinary differential equations and understand their applications in engineering and physics.
	MATH-M-T-05	Algebra-II	Expand knowledge of advanced algebraic systems such as modules and field extensions.
Semester V	MATH-M-T-06	Riemann Integration & Series of Functions	- Study Riemann integration and its applications. - Analyse series of functions for convergence and uniform convergence.
	MATH-M-T& P-07	Numerical Analysis (Theory & Practical)	Develop numerical methods for solving equations and analyse their efficiency and accuracy.

Semester	Course Code	Course Title	Course Outcome (CO)
Semester VI	MATH-M-T-08	Mechanics-I	Understand the laws of mechanics and their mathematical representation.
	MATH-M-T-09	LPP & Game Theory	Explore optimization techniques using linear programming and analyse strategic interactions through game theory.
	MATH-M-T-10	Multivariate Calculus, Vector & Tensor Analysis	Extend calculus to multiple variables and apply vector and tensor analysis in higher dimensions.
Semester VII	MATH-M-T-11	Probability & Statistics	Learn statistical measures, distributions, and probability theories for data analysis.
	MATH-M-T-12	Mechanics-II	Extend understanding of advanced mechanics topics such as rigid bodies and Lagrangian systems.
	MATH-M-T-13	Metric Spaces & Complex Analysis	Explore the topology of metric spaces and analyse functions of complex variables.
Semester VIII	MATH-M-T-14	Ordinary & Partial Differential Equations	Solve and analyse higher-order ODEs and PDEs for scientific and engineering applications.
	MATH-M-T-15	Classical Mechanics & Operations Research	Combine mathematical tools with classical mechanics and decision-making techniques.
	MATH-M-T-16	Differential Geometry & Topology	Understand the concepts of manifolds, curvature, and topological properties.
	MATH-M-T-17	Real Analysis-II & Functional Analysis	Study advanced topics in analysis and the behaviour of linear operators in function spaces.
	MATH-M-T-18	Non-linear Dynamics & Fluid Dynamics	Model and solve problems involving chaos theory and fluid flow.