



Yogoda Satsanga Mahavidyalaya

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(NACC Accredited, Grade: B++, CGPA: 2.89)

CORE COURSE OUTCOME OF MATHEMATICS HONOURS PROGRAMME BASED ON CBCS CURRICULUM

Semester	Course code	Course name	Course outcome
I	C1	Analytic Geometry 2D, Higher Algebra & Trigonometry	<ul style="list-style-type: none">• Changes of axes that is translation and rotation.• General equation of second degree.• Conic sections and its applications.• Applications of complex argument and trigonometry.
	C2	Differential Calculus & Vector Calculus	<ul style="list-style-type: none">• Finding successive differentiation.• Applications of Leibnitz theorem.• Partially differentiation of functions.• Application of Differential calculus in gradient, divergence and curl.
II	C3	Analysis I	<ul style="list-style-type: none">• Uses of the least upper bound property.• Completeness axiom of real numbers.• Concept of a real sequence and infinite series.• Tests for convergence and divergence of sequences and series.
	C4	Integral Calculus & Analytic Geometry 3D	<ul style="list-style-type: none">• Integrating different types of functions. Ex- Rational functions.• Applying Leibnitz rule for differentiation under the sign of integration.• Different types of coordinate systems and changing from one to the other.

			<ul style="list-style-type: none"> • Concepts of planes and straight lines and finding the angle between them.
III	C5	Theory of Real Functions	<ul style="list-style-type: none"> • Concepts of limit of real functions. • Checking continuity at a point. • Method of Riemann integration and Upper and Lower sums. • Applications of Mean value theorems of integration.
	C6	Group Theory & Matrices	<ul style="list-style-type: none"> • Concept of binary operation, algebraic structure and groups. • Examples of non abelian, cyclic and abelian groups. • Algebra of matrices and finding Adjoint and inverse. • Finding solution of homogenous and non homogenous system via matrices.
	C7	Differential Equations	<ul style="list-style-type: none"> • Finding order and degree of a differential equation. • Calculation of Orthogonal trajectories. • Solving higher order differential equations. • Solving partial differential equations.
IV	C8	Analysis II +	<ul style="list-style-type: none"> • Improper integrals and its convergence. • Applying tests for convergence of improper integrals. • Applying Change of order in Multiple integrals. • Idea of Vector integration and calculation of Surface integral.
	C9	Mechanics I	<ul style="list-style-type: none"> • Finding whether system of forces are coplanar. • Conditions useful for equilibrium. • Applications of S.H.M. • Idea of work energy principle.
	C10	Ring Theory	<ul style="list-style-type: none"> • Definition of Ring and its examples. • Theorems on subrings and integral domains. • Idea of Ring Homomorphism. • Working on special types of rings, mainly Polynomial rings.
V	C11	Analysis III {Metric Space & Complex Analysis}	<ul style="list-style-type: none"> • Definition of Metric spaces and its examples. • Concept of Open set and closed set. • Functions of a complex variable.

			<ul style="list-style-type: none"> • Analyticity of a function of complex variable and Cauchy's theorem.
	C12	Linear Algebra	<ul style="list-style-type: none"> • Definition of Vector spaces and its examples. • Idea of linear combination, linear independence and Basis. • Dual spaces and its applications. • Linear operator and diagonalisation.
	DSE1	Number Theory	<ul style="list-style-type: none"> • Concept of divisibility and Division algorithm. • Finding G.C.D. of two or more numbers. • Certain Arithmetic functions and congruences. • Solving Diophantine equations.
	DSE2	Probability and Statistics	<ul style="list-style-type: none"> • Concept of Random variables and its examples. • Different types of distributions and their use. • Idea of sample space and discrete distributions. • Distribution of Order statistics.
VI	C13	Mechanics II	<ul style="list-style-type: none"> • Conditions for equilibrium. • Concept of Work and Catenary. • Understanding Newton's law of gravitation. • The principle of D' Alembert's.
	C14	Numerical Analysis	<ul style="list-style-type: none"> • How to solve algebraic and transcendental equations. • Gauss's elimination method. • Understand Backward and forward interpolation formula. • Calculating Numerical differentiation.
	DSE3	Linear Programming	<ul style="list-style-type: none"> • Properties of Convex sets and questions. • Simplex method and questions. • Transportation and Assignment problem.
	DSE4	Mechanics	<ul style="list-style-type: none"> • Properties of a fluid. • Motion of fluids. • Lagrangian and Eulerian methods.

GENERAL ELECTIVE OUTCOME OF MATHEMATICS FOR OTHER SUBJECTS

Semester	Course code	Course name	Course outcome
I	GE 1	Differential Calculus and Coordinate Geometry 2D	<ul style="list-style-type: none"> • Finding successive differentiation. • Applications of Leibnitz theorem. • Partially differentiation of functions. • Changes of Rectangular axes and questions.
II	GE 2	Integral Calculus, Vector Calculus and Trigonometry	<ul style="list-style-type: none"> • Integrating different types of functions. Ex- Rational functions. • Applying Leibnitz rule for differentiation under the sign of integration. • Application of Differential calculus in gradient, divergence and curl. • Applications of complex argument and trigonometry.
III	GE 3	Real Analysis-I, Group Theory and Differential equations	<ul style="list-style-type: none"> • Bounds and idea of limit of a sequence. • Introduction of groups and examples of cyclic and abelian groups. • Solving differential equations of first order and first degree.
IV	GE 4	Real Analysis-II, Complex Variable, Set Theory and Matrices	<ul style="list-style-type: none"> • Idea of Riemann integral and upper and lower sums. • Fundamental theorem of integral calculus. • Cauchy-Riemann equations and questions. • Idea of sets and examples. • Matrices and its properties.