Syllabus (2023)
IIT-JAM Mathematics

Holistic Learning Platform for Higher Education Exams

IIT-JAM(Mathematics)
Official Syllabus 2023

REAL ANALYSIS

Sequences and Series of Real Numbers

Convergence of Sequences, Bounded and Monotone Sequences, Cauchy Sequences, Bolzano-Weierstrass Theorem, Absolute Convergence, Tests of Convergence for Series – Comparison Test, Ratio Test, Root Test; Power Series (of One Real Variable), Radius and Interval of Convergence, Term-Wise Differentiation and Integration of Power Series.

Functions of One Real Variable

Limit, Continuity, Intermediate Value Property, Differentiation, Rolle's Theorem, Mean Value Theorem, L'Hospital Rule, Taylor's Theorem, Taylor's Series, Maxima and Minima, Riemann Integration (Definite Integrals and Their Properties), Fundamental Theorem of Calculus.

MULTIVARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

Functions of Two or Three Real Variables

Limit, Continuity, Partial Derivatives, Total Derivative, Maxima and Minima.

Integral Calculus

Double and Triple Integrals, Change of Order of Integration, Calculating Surface A reas and Volumes using Double Integrals, Calculating Volumes using Triple Integrals.

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Differential Equations

Bernoulli's Equation, Exact Differential Equations, Integrating Factors, Orthogonal Trajectories, Homogeneous Differential Equations, Method of Separation of Variables, Linear Differential Squations of Second Order with Constant Coefficients, Method of Variation of Parameters, Cauchy-Euler Equation.

LINEAR ALGEBRA AND ALGEBRA

Matrices

Systems of Linear Equations, Rank, Nullity, Rank-Nullity Theorem, Inverse, Determinant, Eigenvalues, Eigenvectors.

Finite Dimensional Vector Spaces

Linear Independence of Vectors, Basis, Dimension, Linear Transformations, Matrix Representation, Range Space, Null Space, Rank-Nullity Theorem.

Groups

Cyclic Groups, Abelian Groups, Non-Abelian Groups, Permutation Groups, Normal Subgroups, Quotient Groups, Lagrange's Theorem for Finite Groups, Group Homomorphisms.