

Government College Chhachhrauli

Summary of Lesson Plan

Name: Dr. Indu Bala

Academic Session: 2025-26.

Class: B.A./ B.Sc.

Semester: I

Subject & Code: Calculus B23-MAT-101

Sr. No.	Unit	Topics/Chapters to be covered	Duration	Assignments and Tests
1.	I	ϵ - δ definition of limit and continuity of a real valued function, Basic properties of limits, Types of discontinuities, Differentiability of functions, Application of L'Hospital rule to indeterminate forms	22.07.2025 – 05.08.2025	
2.	I	Successive differentiation, Leibnitz theorem, Taylor's and Maclaurin's series expansion with different forms of remainder.	06.08.2025 – 20.08.2025	
3.	II	Asymptotes: Horizontal, vertical and oblique asymptotes for algebraic curves, Asymptotes for polar curves, Intersection of a curve and its asymptotes	21.08.2025 – 04.09.2025	
4.	II	Curvature and radius of curvature of curves (cartesian, parametric, polar & intrinsic forms), Newton's method, Centre of curvature and circle of curvature.	06.09.2025 – 20.09.2025	
5.	III	Multiple points, Node, Cusp, Conjugate point, Tests for concavity and convexity, Points of inflexion	22.09.2025 – 06.10.2025	
6.	III	Tracing of curves, Reduction formulae.	08.10.2025 – 18.10.2025	08.10.2025

7.	IV	Rectification, intrinsic equation of a curve	27.10.2025 – 10.11.2025	
8.	IV	Quadrature, Area bounded by closed curves, Volumes and surfaces of solids of revolution	11.11.2025- 24.11.2025	

Note:-

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Students can ask any query on my E-Mail ID also

➤ E-Mail: professorindubansal@gmail.com

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Summary of Lesson Plan

Name: Dr. Indu Bala

Academic Session: 2025-26.

Class: B.A./B. Sc.

Semester: III

Subject & Code: Differential Equations B23-MAT-301

Sr. No.	Unit	Topics/Chapters to be covered	Duration	Assignments and Tests
1.	I	Basic concepts and genesis of ordinary differential equations, Order and degree of a differential equation, Solutions of differential equations of first order and first degree,	22.07.2025 – 05.08.2025	
2.	I	Exact differential equations, Integrating factor, First order higher degree equations solvable for x, y and p, Lagrange's equations, Clairaut's form and singular solutions. Orthogonal trajectories of one-parameter families of curves in a plane.	06.08.2025 – 20.08.2025	

3.	II	Solutions of linear ordinary differential equations with constant coefficients, linear non-homogeneous differential equations. Linear differential equation of second order with variable coefficients	21.08.2025 – 04.09.2025	
4.	II	Method of reduction of order, method of undetermined coefficients, method of variation of parameters. Cauchy-Euler equation.	06.09.2025 – 20.09.2025	
5.	III	Solution of simultaneous differential equations, total differential equations. Genesis of Partial differential equations (PDE), Concept of linear and nonlinear PDEs	22.09.2025 – 06.10.2025	
6.	III	Complete solution, general solution and singular solution of a PDE. Linear PDE of first order. Lagrange's method for PDEs of the form: $P(x, y, z) p + Q(x, y, z) q = R(x, y, z)$, where $p = \partial z / \partial x$ and $q = \partial z / \partial y$.	08.10.2025 – 18.10.2025	08.10.25
7.	IV	Integral surfaces passing through a given curve. Surfaces orthogonal to a given system of surfaces. Compatible systems of first order equations	27.10.2025 – 10.11.2025	
8.	IV	Charpit's method, Special types of first order PDEs, Jacobi's method. Second Order Partial Differential Equations with Constant Coefficients.	11.11.2025- 24.11.2025	

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Summary of Lesson Plan

Name: Dr. Indu Bala

Academic Session: 2025-26.

Class: B.A./B.Sc.

Semester: V

Subject & Code: Sequences and Series B23-MAT-501

Sr. No.	Unit	Topics/Chapters to be covered	Duration	Assignments and Tests
1.	I	Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, Archimedean, algebraic and orderd properties in $\mathbb{R}$. The real number system as a complete ordered field.	22.07.2025 – 05.08.2025	
2.	I	Neighborhoods, interior points, isolated points, limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties. Bolzano- Weiestrass theorem, Open covers, Compact sets and Heine-Borel Theorem.	06.08.2025 – 20.08.2025	
3.	II	Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Subsequential limits, limit superior and limit inferior	21.08.2025 – 04.09.2025	
4.	II	Denumerable and non-denumerable sets, Denumerability of integers, rationals and non-denumerability of real numbers.	06.09.2025 – 20.09.2025	
5.	III	Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series, Cauchy' s general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or p-series.	22.09.2025 – 06.10.2025	
6.	III	Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test, de Morgan and Bertrand's test, Cauchy's Nth root test, Gauss Test, Cauchy's integral test, Cauchy's condensation test.	08.10.2025 – 18.10.2025	09.10.2025

7.	IV	Alternating series, Leibnitz's test, absolute and conditional convergence,	27.10.2025 – 10.11.2025	
8.	IV	Arbitrary series: abel's lemma, Abel's test, Dirichlet's test, Insertion and removal of parenthesis, rearrangement of terms in a series, Dirichlet's theorem, Riemann's Re-arrangement theorem, Pringsheim's theorem (statement only), Multiplication of series, Cauchy product of series, (definitions and examples only).	11.11.2025- 24.11.2025	

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