Lesson Plan for Session 2024-2025 (July 2024 – November 2024)

Name of Assistant Professor: Seema (Mathematics)

Class: BSc III / B.A.- III (Odd Semester)

Paper: Groups and Rings

Duration	Topic to be Covered
3rd Week of July	Groups and Subgroups- Introduction, Binary composition, Properties of Binary operation, definition of Group, Examples of Group
4th Week of July	Theorems on Group, Theorems on order of Group/ Element, Examples
1st Week of August	Definition of Subgroup and Theorems on subgroup, Examples on subgroup, Definition- Cyclic group and Examples, Theorems on Cyclic groups
2nd Week of August	Cosets- Definition, Examples on Cosets, Theorems on Cosets, Equivalence Class and Lagrange's Theorem
3rd Week of August	Normal subgroup, Quotient groups, theorems on Normal subgroup, Quotient groups,Theorems on Quotient groups
4th Week of August	Homomorphisms and Automorphisms,Theorems and Examples ,Kernel of Homomorphisms , Assignment 1.
1st Week of Sept.	Isomorphism, Theorems and Examples on Isomorphism, Automorphism and related Theorems, Group of Automorphisms, Inner Automorphisms and related examples.
2nd Week of Sept.	Inner Automorphisms- Definition and Examples Inner Automorphisms, Group of Automorphisms of Cyclic groups, Centre of Group, Characteristic subgroups and Normalizer of an Element, Class Test.
3rd Week of Sept.	Permutation Groups- Commutator, Cyclic Permutation, Transposition and Disjoint Cycles, Even and Odd permutation, Alternating Group.
4th Week of Sept.	Cayley's Theorem Rings, Integral Domain, Field, Subring ,Centre of a Ring, Characteristic of a Ring, Examples
1st Week of Oct.	Ideals, Product of Ideals, Simple Ring, Principal Ideal, Theorems - Principal Ideal Ring and Principal Ideal Domain, Maximal Ideal and Prime Ideal, Examples, Quotient Rings, Assignment 2
2nd Week of Oct.	Ring Homomorphism, Kernal of Ring Homomorphism, Examples, Theorems and Embedding of Rings Euclidean Rings- Definitions and Theorems, Principal Ideal Domain .
3rd Week of Oct.	Polynomial Rings ,Polynomial Ring over a Ring, Emdedding of Ring into Polynomial Ring, Polynomials over a Field, Divisibility of Polynomials
4th Week of Oct.	Unique Factorization Domain- Definition and Theorems, Theorems on UFD, Primitive Polynomial.
1st Week of Nov.	Gauss Lemma, Related Theorems, Eisenstein's Irreducibility Criterion,
2nd Week of Nov.	Polynomial Rings ,Revision and Test.
3rd Week of Nov.	Test & Revision.

Lesson Plan for Session 2024-2025 (July 2024 – November 2024)

Name of Assistant Professor: Seema (Mathematics)

Class: BSc III / B.A.- III (Odd Semester)

Paper: Numerical Analysis

Duration	Topic to be Covered
3rd Week of July	Finite Difference Operators- Function, Argument, Entry, Interval of difference
4th Week of July	Forward and Backward differences & related questions, Fundamental Theorem of Difference Calculus
1st Week of August	Properties of operator Δ, Difference of functions and related question, Shift operator E, properties, Relation between E, □&∇, Problems & Exercise
2nd Week of August	Effect of error in tabular value, Taking queries of students, Class Test
3rd Week of August	Finite difference operators, Interpolation , Newton – Gregory formula for forward & interpolation, Questions, Subdivision of intervals, Problems & Exercise
4th Week of August	Newton Backward difference, Divided difference, Theorems. Assignment I
1st Week of Sept.	Newton divided difference formula for unequal interval, Relation between Δ . Class Test
2nd Week of Sept.	Lagrange's interpolation formula , Hermite's formula, Sterling formula, Examples
3rd Week of Sept.	Bessel's formula, Examples , Probability Distributions – Introduction, Review of probability
4th Week of Sept.	Mean & Variance of a random variable, Binomial distribution, Examples, Mean & Variance of Binomial distribution, Examples, Fitting a Binomial distribution
1st Week of Oct.	Poission Distribution, Mean & variance, Practical on Given' s method, Class Test
2nd Week of Oct.	Normal Distribution, Examples, Presentation- Normal distribution, Practical on Newton's divided difference, Assignment II.
3rd Week of Oct.	Numerical differentiation: Derivatives using Newton Forward & Backward formula, Derivatives using Sterling , Bessel's Central Diff. formula, Derivative using Newton's Divided Diff. formula.
4th Week of Oct.	Eigen Values & Eigen Vectors, Power method, Jacobi's method, Given method Examples
1st Week of Nov.	House- Holder's Method, QR & Lanczo Method, Numerical integration- Trapezoidal rule. Examples
2nd Week of Nov.	Revision & Test
3rd Week of Nov.	Full Syllabus Test.

Seema

Lesson Plan for Session 2024-2025 (July 2024 – November 2024)

Name of Assistant Professor : Seema (Mathematics)

Class: B.A.- II / BSc II (Odd Semester)

Paper: Partial Differential Equations

Duration	Topic to be Covered
3rd Week of July	Introduction of Partial differential equations: Formation, order and degree of PDE
4th Week of July	Linear and Non-Linear Partial differential equations of the first order: Complete solution, singular solution, General solution
1st Week of August	Solution of Lagrange's linear equations, Charpit's general method of solution.
2nd Week of August	Linear partial differential equations of second and higher orders, Linear and non-linear homogeneous ,Class Test
3rd Week of August	Non-homogenous equations with constant co-efficients.
4th Week of August	Partial differential equation with variable co-efficients reducible to equations with constant coefficients, their complimentary functions and particular Integrals, Assignment I.
1st Week of Sept.	Partial differential equation with variable co-efficients reducible to equations with constant coefficients, their complimentary functions and particular Integrals
2nd Week of Sept.	Classification of linear partial differential equations of second order.
3rd Week of Sept.	Reduction of second order linear partial differential equations to Canonical (Normal) forms and their solutions, Assignment II
4th Week of Sept.	Monge's method for partial differential equations of second order. Class Test
1st Week of Oct.	Cauchy's problem for second order partial differential equations
2nd Week of Oct.	Characteristic equations and characteristic curves of second order partial differential equation.
3rd Week of Oct.	Method of separation of variables: Solution of Laplace's equation, Wave equation (one and two dimensions),Class Test
4th Week of Oct.	Heat equation (one and two dimensions),Class Test.
1st Week of Nov.	Solution of Diffusion (Heat) equation (one and two dimension) in Cartesian Co-ordinate system.
2nd Week of Nov.	Revision and Class test.
3rd Week of Nov.	Full Syllabus test.

Lesson Plan for Session 2024-2025 (July 2024 – November 2024)

Name of Assistant Professor: Seema (Mathematics)

Class: B.A.- II / BSc II (Odd Semester)

Paper: Advanced Calculus

Duration	Topic to be Covered
3rd Week of July	Continuity , Sequential continuity and related examples
4th Week of July	Properties of continuous functions, uniform continuity , Limit and continuity of real valued functions of two variables
1st Week of August	Limit and continuity of real valued functions of two variables, Partial differentiation, Homogeneous functions
2nd Week of August	Euler's theorem , Taylor theorem for functions of two variable & Class Test.
3rd Week of August	Total differentiation, Homogenious functions and Euler's theorem, taylor theorem for functions of two variable, Assignment I
4th Week of August	Taylor's theorem for function of two variables, total differentiation & Maxima, minima, Class Test.
1st Week of Sept.	Saddle points of two variables langrange's method of multipliers
2nd Week of Sept.	Differentiability of real valued functions of two variables, Doubt Class
3rd Week of Sept.	Schwarz and young's theorem, implicit function theorem, Class test.
4th Week of Sept.	Curves, tangents & Binormals and principal normal,Assignment II.
1st Week of Oct.	Serret frenet formulae , locus of centre of curvature.
2nd Week of Oct.	spherical curvature, Mean value theorem and examples
3rd Week of Oct.	Mean value theorem , Rolle's theorem & related examples.
4th Week of Oct.	Langrange's mean value theorem ,Indeterminate forms,
1st Week of Nov.	Darboux intermediate value theorem for derivatives
2nd Week of Nov.	Test and Revision
3rd Week of Nov.	Full Syllabus Test.

Lesson Plan for Session 2024-2025 (July 2024 – November 2024)

Name of Assistant Professor: Seema (Mathematics)

Class: BSc I / B.A.- I (Odd Semester)

Paper: Calculus

Duration	Topic to be Covered
3rd Week of July	ε-δ definition of limit and continuity of a real valued function and related examples
4th Week of July	Basic properties of limits, Types of discontinuities , related examples
1st Week of August	Differentiability of functions, Application of L'Hospital rule to indeterminate forms
2nd Week of August	Application of L'Hospital rule to indeterminate forms
3rd Week of August	Successive differentiation, Leibnitz theorem, Taylor's and Maclaurin's series expansion with different forms of remainder
4th Week of August	Leibnitz theorem, Taylor's and Maclaurin's series expansion with different forms of remainder
1st Week of Sept.	Asymptotes: Horizontal, vertical and oblique asymptotes for algebraic curves, related exercise
2nd Week of Sept.	Asymptotes for polar curves, Intersection of a curve and its asymptotes
3rd Week of Sept.	Curvature and radius of curvature of curves (cartesian, parametric, polar & intrinsic forms)
4th Week of Sept.	Newton's method, Centre of curvature and circle of curvature.
1st Week of Oct.	Multiple points, Node, Cusp, Conjugate point, Tests for concavity and convexity
2nd Week of Oct.	Points of inflexion, Tracing of curves, Reduction formulae.
3rd Week of Oct.	Rectification. intrinsic equation of a curve
4th Week of Oct.	Quadrature, Area bounded by closed curves
1st Week of Nov.	Volumes and surfaces of solids of revolution
2nd Week of Nov.	Doubt class and test
3rd Week of Nov.	Revision and full syllabus test.

Lesson Plan for Session 2024-2025 (July 2024 – November 2024)

Name of Assistant Professor: Seema (Mathematics)

Class: BSc I / B.A.- I (Odd Semester)

Paper: Introductory Mathematics (MDC)

Duration	Topic to be Covered
3rd Week of July	Sets and their representations, Empty set, Finite and infinite sets, Subsets.
4th Week of July	Equal sets, Power sets, Universal set, Union and intersection of sets, Difference of two sets & Related examples
1st Week of August	Complement of a set,Venn diagram, De-Morgan's laws and their applications, doubt class
2nd Week of August	Venn diagram, De-Morgan's laws and their applications. An introduction to matrices and their types and related examples.
3rd Week of August	An introduction to matrices and their types, Operations on matrices, Symmetric and skew-symmetric matrices, Minors, Co-factors. Determinant of a square matrix.
4th Week of August	Determinant of a square matrix, Adjoint and inverse of a square matrix. Solutions of a system of linear equations up to order
1st Week of Sept.	Complex numbers, Operations on complex numbers, Modulus and argument of a complex number.
2nd Week of Sept.	Linear inequalities, Algebraic solutions of linear inequalities in two variables and their graphical representation. Quadratic equations, Solution of quadratic equations
3rd Week of Sept.	Arithmetic progression, Geometric progression and related examples
4th Week of Sept.	Harmonic progression, Arithmetic mean (A.M.), Geometric mean (G.M.), Harmonic mean (H.M.), Relation between A.M., G.M. and H.M
1st Week of Oct.	Straight lines: Slope of a line and angle between two lines, related problems
2nd Week of Oct.	Different forms of equation of a line: Parallel to co-ordinate axes, Point-slope form.
3rd Week of Oct.	Slope-intercept form, Two-point form examples
4th Week of Oct.	Two-point form, General form: Distance of a point from a straight line. Standard form of a circle and its properties
1st Week of Nov.	Standard form of a circle and its Properties,related problems
2nd Week of Nov.	Doubt class.
3rd Week of Nov.	Test & Revision.