LESSON PLAN

Session: 2024-2025   **Class: B.A/B.Sc.-I Year -1st Semester**

Nomenclature of the paper: Calculus   **Paper code: B23-MAT -101**

Teacher Incharge: Dr. Poonam Saini / Ms. Sonia

Month	Week	Topics to be covered
July	25.07.2024-31.07.2024	€-S definition of limit of a function.
August	01.08.2024– 10.08.2024	Limit and Continuity of a real valued function, Basic properties of limits, continuous functions and classification of discontinuities, differentiability.
	12.08.2024– 17.08.2024	Application of L Hospital Rule to Indeterminate forms.
	19.08.2024– 24.08.2024	Successive differentiation, Leibnitz theorem, Maclaurin and Taylor' series. Assignment and Test Series
	26.08.2024– 31.08.2024	Asymptotes-Horizontal, vertical and oblique asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates.
September	02.09.2024 –07.09.2024	Curvature, radius of curvature of Cartesian curves.
	09.09.2024 –14.09.2024	Radius of curvature of parametric curves, polar curves, Newton's method.
	16.09.2024 –21.09.2024	Radius of curvature for pedal curves, tangential polar equations.
	23.09.2024 –30.09.2024	Centre of curvature, circle of curvature, chord of curvature and evolutes.
October	01.10.2024– 05.10.2024	Tests for concavity and convexity, points of inflexion, multiple points, cusps, nodes and conjugate points , types of cusps.
	07.10.2024– 12.10.2024	Revision and Sessionals.
	14.10.2024– 19.10.2024	Tracing of curves in Cartesian, parametric and polar coordinates.
	21.10.2024– 26.10.2024	Reduction formulae, Rectification, intrinsic equation of curve.
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.24-06.11.24	Quadrature, Sectorial area.
	06.11.24- 09.11.24	Area bounded by closed curves, Volume and surface area of solids of revolutions
	09.11.24-16.11.24	Volume and surface area of solids of revolutions examples
	17.11.24-24.11.24	Revision and Tests
	25.11.24-onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: B.A. /B.Sc. II Year – 3rd Semester**

Subject: Differential Equations –I   **Paper Code: B23-MAT-301**

Teacher Incharge: Dr. Poonam Saini

Month	Dates	Topics covered
July	25.07.2024-31.07.2024	Basic concepts and genesis of ordinary differential equations, Order and degree of a differential equation
August	01.08.2024–10.08.2024	Solutions of differential equations of first order and first degree, Exact differential equations, Integrating factor
	12.08.2024–17.08.2024	Revision of Previous Chapters with class tests. First order higher degree equations solvable for x, y and p.
	19.08.2024–24.08.2024	Lagrange's equations, Clairaut's form and singular solutions.
	26.08.2024–31.08.2024	Orthogonal trajectories of one-parameter families of curves in a plane. Revision of Previous Chapters with class tests.
September	02.09.2024 – 07.09.2024	Solutions of linear ordinary differential equations with constant coefficients, linear non-homogeneous differential equations.
	09.09.2024 – 14.09.2024	Linear differential equation of second order with variable coefficients. Method of reduction of order, method of undetermined coefficients.
	16.09.2024 – 21.09.2024	Method of variation of parameters. Cauchy-Euler equation.
	23.09.2024 – 30.09.2024	Revision of Previous Chapters with class tests. Assignment based on unit I and II
October	01.10.2024–05.10.2024	Solution of simultaneous differential equations, total differential equations.
	07.10.2024–12.10.2024	Genesis of Partial differential equations (PDE), Concept of linear and non-Linear PDEs. Revision of Previous Chapters with class tests.
	14.10.2024–19.10.2024	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 $q=\partial z/\partial y$.
	21.10.2024–26.10.2024	Integral surfaces passing through a given curve. Surfaces orthogonal to a given system of surfaces. Compatible systems of first order equations.
	27.10.2024–03.11.2024	Diwali Vacations
November	04.11.24-06.11.24	Charpit's method, Special types of first order PDEs. Assignment based on unit III and IV
	06.11.24 - 09.11.24	Jacobi's method. Second Order Partial Differential Equations with Constant Coefficients.
	09.11.24-16.11.24	Unit wise test of all covered Units.
	17.11.24-24.11.24	Discussion of problems and revision of important topics
	25.11.24-onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: B.A/B.Sc.-III Year – 5th Semester**

Subject: Real Analysis   **Paper Code: BM-351**

Teacher Incharge: Dr. Poonam Saini

Month	Week	Topics to be covered
July	25.07.2024– 31.07.2024	Riemann integral –Introduction, Integrabililty of continuous and monotonic functions. Discussion of related problems.
August	01.08.2024– 10.08.2024	Theorems on Integrability and discussion of excercize problems
	12.08.2024– 17.08.2024	The Fundamental theorem of integral calculus. Mean value theorems of integral calculus
	19.08.2024– 24.08.2024	Improper integrals and their convergence.
	26.08.2024– 31.08.2024	Comparison tests, Abel's and Dirichlet's tests, Frullani's integral. Revision and Test Series
September	02.09.2024 –07.09.2024	Integral as a function of a parameter. Continuity, Differentiability and integrability of an integral of a function of parameter.
	09.09.2024 –14.09.2024	Assignment based on unit I and II
	16.09.2024 –21.09.2024	Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets.
	23.09.2024 –30.09.2024	Closure and interior, boundary points, Subspace of a metric space.
October	01.10.2024– 05.10.2024	Equivalent metrics. Cauchy sequences, completeness, Cantor's intersection theorem.
	07.10.2024– 12.10.2024	Revision and Sessionals
	14.10.2024– 19.10.2024	Continuous functions, uniform continuity.
	21.10.2024– 26.10.2024	Compactness for metric spaces, Sequential compactness, Bolzano-Weierstrass property, total boundedness.
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Finite intersection property, Continuity in relation with compactness. Continuity in relation with connectedness.
	11.11.2024– 16.11.2024	Continuity in relation with connectedness. Assignment,
	18.11.2024– 23.11.2024	Assignment, Revision of topics and tests.
	25.11.2024 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: B.A. /B.Sc. III Year – 5th Semester**

Subject: Group and Ring   **Paper Code: (BM-352)**

Teacher Incharge: Ms. Meenakshi

Month	Dates	Topics to be covered
July	25.07.2024– 31.07.2024	Definition of group, properties of groups, subgroups,
August	01.08.2024– 10.08.2024	generation of groups, cyclic groups, Cosets, left and right cosets
	12.08.2024– 17.08.2024	Index of a subgroups, coset decomposition, lagrange's theorem
	19.08.2024– 24.08.2024	normal subgroups, quotient groups Assignment and Test Series
	26.08.2024– 31.08.2024	Homomorphisms, Isomorphisms
September	02.09.2024 – 07.09.2024	automorphisms and inner automorphisms of a group, Automorphisms of cyclic groups
	09.09.2024 – 14.09.2024	Permutations groups, even and odd permutations, Alternating groups, Cayley's theorem, centre of groups and derived group of a group
	16.09.2024 – 21.09.2024	Assignment and Test Series
	23.09.2024 – 30.09.2024	Introduction to rings, Subrings, integral domains and fields
October	01.10.2024– 05.10.2024	Ideals and quotient rings, Field of quotients of I.D
	07.10.2024– 12.10.2024	Euclidean rings, polynomials rings, polynomial over the rational field assignment and Test Series
	14.10.2024– 19.10.2024	Assignment and Test Series
	21.10.2024– 26.10.2024	The Eisenstein's criterion of irreducibility
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Polynomial rings over commutative rings
	11.11.2024– 16.11.2024	Unique factorisation domain, R unique factorisation domain
	18.11.2024– 23.11.2024	Revision and test
	25.11.2024 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: B.A./B.Sc. III Year – 5th Semester**

Subject: Numerical Analysis   **Paper Code: (BM-353)**

Teacher Incharge: Dr. Jatinder Kaur

Month	Dates	Topics covered
July	25.07.2024-31.07.2024	Review of Basics of Previous classes, Formulas Used and their applications. Syllabus and books prescription.
August	01.08.2024– 10.08.2024	Finite difference operators and their relations, Interpolation with equal intervals.
	12.08.2024– 17.08.2024	Newton's forward and backward Interpolation.
	19.08.2024– 24.08.2024	Interpolation with unequal intervals; Newton's divided difference, Lagrange's interpolation. Hermit's formula.
	26.08.2024– 31.08.2024	Central differences; Gauss forward and backward interpolation formulae. Sterling and Bessel's formula.
September	02.09.2024 – 07.09.2024	Derivatives of functions using: Newton's forward and backward interpolation, Gauss forward and backward interpolation formulae.
	09.09.2024 – 14.09.2024	Derivatives of functions using: Sterling and Bessel's formula, Newton's divided difference formula.
	16.09.2024 – 21.09.2024	Eigen Value Problems: Power method, Jacobi's method, Given's method.
	23.09.2024 – 30.09.2024	Problems of Power method, Jacobi's method, Given's method. House-Holder's method with its applications.
October	01.10.2024– 05.10.2024	Numerical Integration: Trapezoidal rule, Simpson's rule, Chebychev formula.
	07.10.2024– 12.10.2024	Sessional Exam. Quadrature formula. Numerical solution of differential equations: Picard's method.
	14.10.2024– 19.10.2024	Taylor's series method, Euler's method, Euler's Modified method, Runge- Kutta method.
	21.10.2024– 26.10.2024	Practice of Euler's method, Euler's Modified method, Runge- Kutta method.Miline's Simpson method.
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Probability distribution of random variables, Binomial distribution.
	11.11.2024– 16.11.2024	Poisson's distribution, Mean and Variance. Normal distribution.
	18.11.2024– 23.11.2024	Unit wise test of all covered Units. Discussion of mistakes done by students of every unit. Special attention to weak students.
	25.11.2024 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (P) – 1ˢᵗ Semester**

Subject: Real Analysis   **Paper Code: M24-MAT-101**

Teacher Incharge: Ms. Meenakshi

Month	Dates	Topics to be covered
August	07.08.2024– 10.08.2024	Definition and existence of the Riemann-Stieltjes integral
	12.08.2024– 17.08.2024	properties ofthe integral, integration and differentiation, the fundamental theorem of calculus
	19.08.2024– 24.08.2024	integration of vector-valued functions, rectifiable curves.
	26.08.2024– 31.08.2024	Assignment and Test Series
September	02.09.2024 – 07.09.2024	Sequences and series of functions: Pointwise and uniform convergence of sequences of functions, Cauchy criterion for uniform convergence,
	09.09.2024 – 14.09.2024	Dini‟s theorem, uniform convergence and continuity, uniform convergence and Riemann integration, uniform convergence and differentiation.
	16.09.2024 – 21.09.2024	Convergence and uniform convergence of series of functions, Weierstrass M-test, integration and differentiation of series of function
	23.09.2024 – 30.09.2024	existence of a continuous nowhere-differentiable function, the Weierstrass approximation theorem. Assignment and Test Series
October	01.10.2024– 05.10.2024	Functions of several variables: Linear transformations, the space of linear transformations on Rn to Rm as a metric space
	07.10.2024– 12.10.2024	open sets, continuity, derivative in an open subset of Rn, chain rule, partialderivatives, continuously differentiable mappings
	14.10.2024– 19.10.2024	the contraction principle, the inverse function theorem, the implicit function theorem. Revision Test
	21.10.2024– 26.10.2024	Fourier Series: Formulation of convergence problems, the necessary andsufficient condition for the Fouriesr series for f at x to converge to f(x)
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	The (C,1) summability of Fourier series, Fejer theorem, The theory of Fourier series, Bessel‟s inequality, Riesz Fischer theorem
	1.11.2024– 16.11.2024	Parseval‟s equality, convergence of Fourier series, Riemann-Lebesgue theorem, Orthonormal expansions in [ ], Bessel‟s inequality for generalized Fourier series.
	18.11.2024– 23.11.2024	Revision And test series
	25.11.2024 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (P) – 1st Semester**

Subject: Complex Analysis   **Paper Code: (M24-MAT-102)**

Teacher Incharge: Ms. Meenakshi

Month	Dates	Topics to be covered
August	07.08.2024– 10.08.2024	Analytic functions; Harmonic functions; Reflection principle
	12.08.2024– 17.08.2024	Elementary functions: Exponential, Logarithmic, Trigonometric, Hyperbolic, Inverse trigonometric, Inverse hyperbolic, Complex exponents;
	19.08.2024– 24.08.2024	Complex Integration: Definite integral; Contours; Branch cuts.
	26.08.2024– 31.08.2024	Assignment and Test Series
September	02.09.2024 – 07.09.2024	Cauchy-Goursat theorem; Simply/ multiply connected domains; Cauchy integral formula,
	09.09.2024 – 14.09.2024	Morera's theorem; Liouville's theorem, Maximum modulus principle
	16.09.2024 – 21.09.2024	Power series: Taylor series; Laurent series; Uniform/ absolute convergence.
	23.09.2024 – 30.09.2024	Assignment and Test Series
October	01.10.2024– 05.10.2024	Differentiation, integration, multiplication, division of power series;
	07.10.2024– 12.10.2024	Singularities; Poles; Residues; Cauchy's residue theorem; Zeros of an analytic function;
	14.10.2024– 19.10.2024	Evaluation of improper integrals; Jordan's lemma. Assignment and Test Series
	21.10.2024– 26.10.2024	Indented paths; Integration along a branch cut; Definite integrals involving sines and cosines; Winding number of closed curve;
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Argument principle; Rouche's theorem; Schwarz Lemma;
	11.11.2024– 16.11.2024	Transformations: linear, bilinear (Mobius), sine, z^2, $z^{1/2}$;
	18.11.2024– 23.11.2024	Mapping: Isogonal; Conformal; Scale factors; Local inverses; harmonic conjugates. Revision and test
	25.11.2024 onwards	---------------- University Examination -------------------

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (P) - 1ˢᵗ Semester**

Subject: Theory of Ordinary Differential Equations   **Paper Code: M24-MAT-103**

Teacher Incharge: Ms. Simranjot

Month	Dates	Topics to be covered
August	21.08.2024– 25.08.2024	Existence and Uniqueness of Solutions: Existence of solutions; Initial value problem, ε-approximate solution,
	26.08.2024– 31.08.2024	Equicontinuous set of functions Ascoli lemma, Cauchy–Peano existence theorem and its corollary, Uniqueness of solutions; Lipschitz condition, Gronwall's inequality
September	02.09.2024 – 07.09.2024	Inequality involving approximate solutions, Method of successive approximations, Picard-Lindelöf theorem.
	09.09.2024 – 14.09.2024	Continuation of solutions, Maximal interval of existence, Extension theorem. Theory of linear differential equations: Linear Differential Equation (LDE) of order n, Basic theory of homogeneous linear equation,
	16.09.2024 – 21.09.2024	Wronskian theory: Definition, necessary and sufficient condition for linear dependence and linear independence of solutions of homogeneous LDE, Abel's Identity, Fundamental sets, More Wronskian theory,
	23.09.2024 – 30.09.2024	Reduction of order, non-homogeneous linear differential equation of order n: Variation of parameters.
October	01.10.2024– 05.10.2024	Adjoint equations, Lagrange's Identity, Green's formula, Self-adjoint equation of second order.Linear differential equation of order n with constant coefficients, Characteristic roots, Fundamental set. Revision Test
	07.10.2024– 12.10.2024	Linear second order equations: Preliminaries, Superposition principle, Riccati's equation, Prüffer transformation. Oscillations of second order differential equations: Zero of a solution,
	14.10.2024– 19.10.2024	Oscillatory and non-oscillatory equations, Abel's formula, Common zeros of solutions and their linear dependence, Sturm separation theorem, Sturm fundamental comparison theorem and its corollaries
	21.10.2024– 26.10.2024	Elementary linear oscillations, Comparison theorem of Hille-Wintner, Oscillations of $x' + a(t)x = 0$.. Revision Test
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Second order boundary value problems (BVP): Linear problems; periodic boundary conditions, regular linear BVP,
	11.11.2024– 16.11.2024	singular linear BVP; non-linear BVP, Sturm-Liouville BVP; Definition,Characteristic values and Characteristic functions. Orthogonality of characteristic functions.
	18.11.2024– 23.11.2024	Green's functions: Definition and Properties. Applications of boundary value problems, Picard's theorem. Revision And test series
	25.11.2024 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (P) – 1st Semester**

Subject: Mechanics of Solids   **Paper Code: M24-MAT-104**

Teacher Incharge: Ms. Simranjot

Month	Dates	Topics to be covered
August	21.08.2024– 25.08.2024	Tensor Algebra: Coordinate-transformation, Cartesian Tensors of different order. Properties of tensors. Isotropic tensors of different orders and relation between them.
	26.08.2024– 31.08.2024	Symmetric and skew symmetric tensors. Tensor invariants. Deviatoric tensors. Eigen-values and eigen-vector of tensor.
September	02.09.2024 – 07.09.2024	Tensor invariants. Deviatoric tensors. Eigen-values and eigen-vector of tensor. Tensor Analysis: Scalar, vector, tensor functions, Comma notation. Gradient, divergence and curl of a vector / tensor field.
	09.09.2024 – 14.09.2024	Analysis of Strain: Affine transformation, Infinitesimal affine deformation. Strain tensor, Geometrical Interpretation of strain component.
	16.09.2024 – 21.09.2024	Strain quadric of Cauchy. Principal strains,Invariants, General infinitesimal deformation. Examples of strain,Equations of compatibility.
	23.09.2024 – 30.09.2024	Analysis of Stress: Stress Vector, Stress tensor, Equations of equilibrium, Revision Test
October	01.10.2024– 05.10.2024	Transformation of coordinates. Stress quadric of Cauchy, Principal stresses. Maximum normal and shear stresses. Mohr's circles. Examples of stress.
	07.10.2024– 12.10.2024	Equations of Elasticity: Generalised Hooke's Law, Anisotropic symmetries, Homogeneous Isotropic media. Homogeneous Isotropic media., Elasticity moduli for Isotropic media.
	14.10.2024– 19.10.2024	Equilibrium and dynamic equations for an isotropic elastic solid. Strain energy function and its connection
	21.10.2024– 26.10.2024	Beltrami-Michell compatibility equations. Uniqueness of solution. Clapeyron‟s theorem, Saint-Venant's principle. Revision Test
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Variational Methods: Variational problems and Euler's Equations, Theorem of minimum potential energy, Theorem of minimum complementary energy
	11.11.2024– 16.11.2024	Reciprocal theorem of Betti and Rayleigh. Ritz method: one- and two-dimensional cases. Galerkin method. Method of Kantorovich. Wave propagation in infinite regions. Surface waves
	18.11.2024– 23.11.2024	Revision And test series
	25.11.2024 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (P) – 1st Semester**

Subject: Advanced Algebra   **Paper Code: M24-MAT-105**

Teacher Incharge: Ms. Sonia

Month	Dates	Topics to be covered
August	07.08.24-10.08.24	Normal subgroup, quotient group, normalizer and centralizer of a non-empty subset of a group G,
	12.08.24-17.08.24	Commutator subgroups of a group. first, second and third isomorphism theorems, correspondence theorem, Aut(G), Inn(G), automorphism group of a cyclic group, G-sets,
	19.08.24-24.08.24	orbit of an element in group G, Cayley's theorem. conjugate elements and conjugacy classes, class equation of a finite group G and its applications,
	26.08.24-31.08.24	Burnside theorem. normal series, composition series, Jordan Holder theorem, Zassenhaus lemma
September	02.09.24-07.09.24	Scheier's refinement theorem, solvable group, nilpotent group. Assignment-1 and Test Series.
	09.09.24-14.09.24	Cyclic decomposition, even and odd permutation, Alternation group An, simplicity of the Alternating group An (n>5).
	16.09.24-21.09.24	Cauchy's theorem, Sylow's first, second and third theorems and its applications to group of smaller orders.
	23.09.24-30.09.24	groups of order p2 and pq (q>p). Modules, submodules, direct sums, finitely generated modules, cyclic module.
October	01.10.24-05-10.24	R-homomorphism, quotient module, completely reducible modules, Assignment-II and Test Series
	06.10.24-12.10.24	Schur's lemma, free modules, representation of linear mapping, rank of linear mapping.
	13.10.24-19.10.24	Similar linear transformation, invariant subspaces of vector spaces, reduction of a linear transformation to triangular form,
	21.10.24-26.10.24	Nilpotent transformation, index of nilpotency of a nilpotent transformation. Cyclic subspace with respect to a nilpotent transformation
	27.10.24-03.11.24	Diwali Vacations
November	04.11.24-09.11.24	Assignment-III and Test Series. Uniqueness of the invariants of a nilpotent transformation. Primary decomposition theorem. Jordan blocks.
	11.10.24-16.11.24	Jordan canonical forms, cyclic module relative to a linear transformation
	18.11.24-23.11.24	Rational canonical form of a linear transformation and its elementary divisors, uniqueness of elementary divisors.
	25.11.24 onwards	---------------------Examination---

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (F) – 3rd Semester**

Subject: Functional Analysis   **Paper Code: MM-501**

Teacher Incharge: Ms. Meenakshi

Month	Days	Topics to be covered
July	25.07.2024 -31.07.2024	Normed linear spaces, Banach spaces and examples
August	01.08.2024– 10.08.2024	subspace of a Banach space, completion of a normed space. Quotient space of a normed linear space its completeness
	12.08.2024– 17.08.2024	product of normed spaces, finite dimensional normed spaces and subspaces, equivalent norms
	19.08.2024– 24.08.2024	compactness and finite dimension. Assignment and Test Series
	26.08.2024– 31.08.2024	F. Riesz's lemma. Bounded and continuous linear operators, differentiation operator,
September	02.09.2024 – 07.09.2024	integral operator, bounded linear extension, linear functional. Bounded linear functional, continuity and boundedness
	09.09.2024 – 14.09.2024	Definite integral, canonical mapping, linear operators and functionals on finite dimensional spaces. Revision & Tests
	16.09.2024 – 21.09.2024	Hahn-Banach theorem for real linear spaces, complex linear spaces and normed linear spaces, application to bounded linear functionals on C[a,b], Riesz-representation theorem for bounded functionals on C[a,b].
	23.09.2024 – 30.09.2024	Adjoint operator, norm of the adjoint operator. Reflexive spaces, uniform boundedness theorem and some of its applications to the space of polynomials and fourier series.
October	01.10.2024– 05.10.2024	Inner product spaces, Hilbert spaces and their examples Pythagorean theorem, Apollonius identity, inequality, continuity of inner product, completion of an inner product space.
	07.10.2024– 12.10.2024	Subspace of a Hilbert space, complements and direct sums, projection theorem, characterization of sets in. Revision And Taking problems.
	14.10.2024– 19.10.2024	Assignment & Strong and weak convergence, Convergence or Sequence of Opreators, Open mappng & closed graph theorem.
	21.10.2024– 26.10.2024	Orthonormal sets and sequences, Bessel's inequality, series related to orthonormal sequences and sets, total(complete) orthonormal sets and sequence.
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Parseval's identity, separable Hilbert space Representation of functionals on Hilbert Space, presentation theorem for bounded linear functionals on a Hilbert space.
	11.11.2024– 16.11.2024	Sesquilinear form, Riesz representation theorem for bounded sesquilinear forms on a Hilbert space, Hilbert adjoint operator, its existence uniqueness, properties of Hilbert adjoint operators, self-adjoint, unitary, normal, positive and projection operator
	18.11.2024– 23.11.2024	Revision Test
	25.11.2024 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (F) – 3rd Semester**

Subject: Analytical Mechanics and Calculus of variation   Paper Code: MM-502

Teacher In-charge: Ms. Sonia

Month	Dates	Topics to be covered
August	07.08.24-10.08.24	Shortest distance, Minimum surface of revolution, Brachistochrone, problem, Geodesic.
	12.08.24-17.08.24	Fundamental lemma of Calculas of variation, Euler's equation for one dependent function of one and several independent variables.
	19.08.24-24.08.24	Its generalization to (I) Functinal depending on 'n' dependent functions (II)
	26.08.24-31.08.24	Functional depending on higher order derivatives, Variational derivative. **Revision Test.**
September	02.09.24-07.09.24	Invariance of Euler's equations, natural boundary conditions and transition conditions, conditional extremum under geometric constraints and under integral constraints, Variable end points. Assignment-1
	09.09.24-14.09.24	Free and constraints systems, constraints and their classification, Generalised coordinates, Holonomic and Non-Holonomic systems, Scleronomic and Rheonomic systems, Generalized Potential. **Revision Test**
	16.09.24-21.09.24	Possible and virtual displacements, ideal constraints, Lagrange's equation of first kind Principle of virtual displacements D' Alembert's principle,
	23.09.24-30.09.24	Holonomic Systems independent coordinates, generalized forces, Lagrange's equation of second kindl.Uniqueness of solution, Theorem on variation of total Energy, Assignment-II
October	01.10.24-05.10.24	Potential Lagrange's equations for potential forces equation for conservative fields, Hamilton's variables, Donkin's theorem, Hamilton canonical equations.
	06.10.24-12.10.24	Routh's equations, Cyclic coordinates, Poisson's bracket, Poisson's identity, Jacobi's-Poisson's theorem
	13.10.24-19.10.24	Hamilton's Principle, second form of Hamilton's principle, Poincare-Carton integral invariant, Whittaker's equations
	21.10.24-26.10.24	Jacobi's equations, Principle of least action, canonical transformations, **Revision Test**
	27.10.24-03.11.24	Diwali Vacations
November	04.11.24-09.11.24	Assignment-III, Hamilton-Jacobi equation, Jacobi theorem, Method of separation of variables.Testing the canonical character of a transformation.
	11.10.24-16.11.24	Lagrange's brackets, Simplicial nature of the Jacobian matrix of a Canonical Transformations
	18.11.24-23.11.24	Invariance of Lagrange brackets and Poisson's bracket under canonical transformation **Revision Test**
	25.11.24 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (F) – 3rd Semester**

Subject: Elasticity   **Paper Code: 503 opt. (I)**

Teacher Incharge: Ms. Sonia

Month	Dates	Topics to be covered
August	07.08.24-10.08.24	Tensor Algebra: Coordinate Transformation, Cartesian tensor of different order,
	12.08.24-17.08.24	Properties of tensors. Isotropic tensor of different orders and relation between them
	19.08.24-24.08.24	Symmetric and Skew Symmetric tensors. Eigen Values and eigenvectors of a tensor.
	26.08.24-31.08.24	Scalar, vector, tensor functions, comma Notation.
September	02.09.24-07.09.24	gradient, divergence, curl of vectors/tensors field
	09.09.24-14.09.24	Revision & Tests of Unit-I, Assignment-I
	16.09.24-21.09.24	Affine transformation, Infinitesimal Affine deformation, Geometrical Interpretation of strain Component.
	23.09.24-30.09.24	Strain quadric of Cauchy, Principal strains and invariance,
October	01.10.24-05.10.24	General Infinitesimal deformation. Sessionals & Assignments
	06.10.24-12.10.24	Saint-variant's equation of Compatibility & Revision, Stress quadric of Cauchy, Principal Stress and Invariants.
	13.10.24-19.10.24	Maximum normal and shear stress, Mohr's Circle, Generalised Hooke's Law.
	21.10.24-26.10.24	Strain energy function & Connection with Hooke's Law, Revision Tests & Assignments
	27.10.24-03.11.24	Diwali Vacations
November	04.11.24-09.11.24	Homogeneous Isotropic Medium, Elastic Moduli for Isotropic media.
	11.10.24-16.11.24	Uniqueness of solution., Beltremi Hickbell compatibility equations,
	18.11.24-23.11.24	Clapeyron's Theorem, Saint- venant's Principle. **Revision Test**
	25.11.24 onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (F) – 3ʳᵈ Semester**

Subject: Fluid Mechanics   **Paper Code: MM-504(opt. I)**

Teacher Incharge: Ms. Sonia

Month	Dates	Topics to be covered
August	07.08.24-10.08.24	Kinematics of fluid in motion, Velocity at a point of a fluid.
	12.08.24-17.08.24	Lagrangian & Eulerian methods, Stream lines, Path lines & Streak lines, vorticity and circulation.
	19.08.24-24.08.24	Vortex lines, Acceleration & Material derivative.Equation of continuity (vector or cartesian form), Reynolds transport theorem.
	26.08.24-31.08.24	General analysis of fluid motion, Properties of fluids-static **Assignment and test**
September	02.09.24-07.09.24	Dynamic pressure, Boundary surfaces and Boundary surfaces conditions, Irrotational &rotational motions, Velocity potential.
	09.09.24-14.09.24	Lagrange's and Euler's equation of motion, Bernoulli's theorem & its applications in one dimensional flow problems. **Test and Revision**
	16.09.24-21.09.24	Kelvins circulation theorem Vorticity equation, Energy equation for incompressible flow, Kinetic energy of irrotational flow
	23.09.24-30.09.24	Kelvins minimum energy theorem, mean potential over a spherical surface energy of infinite liquid, Uniqueness theorem
October	01.10.24-05.10.24	Stress components in a real fluid, Relations between, rectangular components of stress. **Revision test**
	06.10.24-12.10.24	Connection between stress and gradients of velocity, Navier-Stoke's equations of motion
	13.10.24-19.10.24	Steady flows between two parallel plates, Plane Poiseuille and Couette flows, Navier-Stock equations in flows having axis of symmetry
	21.10.24-26.10.24	Steady flow in circular pipe, The Hagen-Poiseuille flow, Steady flow between two co-axial cylinders, flow between two concentric rotating cylinders,
	27.10.24-03.11.24	Diwali Vacations
November	04.11.24-09.11.24	**Assignment and test**. Steady flow through tubes of uniform cross-section in the form (I) Ellipse, (II) Equilateral triangle,
	11.10.24-16.11.24	(III)Rectangle under constant pressure gradient, uniqueness theorem.
	18.11.24-23.11.24	-------------------------------------**Revision test**---
	25.11.24 onwards	---------------------------------- University Examination ---

LESSON PLAN

Session: 2024-2025   **Class: M.Sc. (Final) – 3rd Semester**

Subject: Integral Equation (MM-505(I))   **Paper Code: MM-505(I)**

Teacher Incharge: Ms. Meenakshi

Month	Dates	Topics to be covered
July	25.07.2024 -31.07.2024	Definition of integral Equation and their classifications. Eigen values and Eigen Functions.
August	01.08.2024– 10.08.2024	Special kinds of kernel convolution integral. inner and scalar product of two function, Reduction to a system of algebraic Equations
	12.08.2024– 17.08.2024	Fredholm alternative, Fredholm theorem, Fredholm alternative theorem.
	19.08.2024– 24.08.2024	Revision and Test Series
	26.08.2024– 31.08.2024	Method of successive approximations, iterative scheme for Fredholm and Volterra integral equations of the second kind
September	02.09.2024 –07.09.2024	Conditions of uniform convergence and uniqueness of series solution. Some results about the resolvent kernel.
	09.09.2024 –14.09.2024	Application of iterative scheme to Volterra integral equations of the second kind
	16.09.2024 –21.09.2024	Classical Fredholm theory, the method of solution of Fredholm equation. Revision and Test Series
	23.09.2024 –30.09.2024	Fredholm First Kind, Fredholm second theorem, Fredholm third theorem. Symmetric Kernels, Introduction Complex Hilbert space
October	01.10.2024– 05.10.2024	An orthonormal system of functions, Riesz – Fisher theorem. A complete two –Dimensional orthonormal set over the rectangle.
	07.10.2024– 12.10.2024	Revision and Test Series. Expansion in eigen functions and Bilinear form, Hilbert –Schmidt theorem and some immediate consequences.
	14.10.2024– 19.10.2024	Definite kernels and Mercer theorem. Solution of a symmetric integral Equation. Approximation of a general by a separable kernel.
	21.10.2024– 26.10.2024	Approximation of a general by a separable kernel the operator method in the theory of integral equations, Rayleigh –Ritz method for finding first Eigen value.
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Abel integral Equation inversion formula for singular equation with kernel of the type h(s)-h(t)
	11.11.2024– 16.11.2024	The Cauchy principal value for integrals solution of the Cauchy-type singular integral equation Assignment and Revision work
	18.11.2024– 23.11.2024	-----------------------------------Revision and Test Series--
	25.11.2024 onwards	-------------------------------- University Examination ---

LESSON PLAN

Session: 2024-2025   **Class: B. Com-I – 1st Semester**

Subject: Business Mathematics-I   **Paper code: B23-COM-104**

Teacher Incharge: Ms. Sonia/ Ms. Richa

Month	Week	Topics to be covered
July	25.07.2024-31.07.2024	Representation of sets, Equivalent sets.
August	01.08.2024– 10.08.2024	Power sets, Complement of a set, Venn diagrams: Union and intersection of sets, De-Morgan's Laws.
	12.08.2024– 17.08.2024	Logical Statements and Truth Tables.
	19.08.2024– 24.08.2024	Logarithms: Laws of Operations, Log Tables.
	26.08.2024– 31.08.2024	Arithmatic and Geometric Progression.
September	02.09.2024 –07.09.2024	Assignment and Revision Test.
	09.09.2024 –14.09.2024	Definition of a Matrix, order, equality and type of matrices.
	16.09.2024 –21.09.2024	Operation on Matrices-Addition, Multiplication and Multiplication with a scalar and their simple properties.
	23.09.2024 –30.09.2024	Determinant of a square matrix, properties of determinants, minors,
October	01.10.2024– 05.10.2024	Co-factor and application of determinants in finding the area of triangle.
	07.10.2024– 12.10.2024	Adjoint and Inverse of a square matrix, Solution of a system of linear equations by examples.
	14.10.2024– 19.10.2024	Revision of previous topics on matrices. Revision and Sessionals.
	21.10.2024– 26.10.2024	Different type of Interest rates, Type of Annuties
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.24-06.11.24	Present value and amount of annuity.
	06.11.24- 09.11.24	Valuation of simple loans and debantures.
	09.11.24-16.11.24	Problems related to sinking funds
	17.11.24-24.11.24	Revisions and class tests.
	25.11.24-onwards	---------------- University Examination -------------------

LESSON PLAN

Session: 2024-2025   **Class: B.C.A- I – 1st Semester**

Subject: Mathematical foundation for Computer science-I   **Paper Code: B-23-CAP-104**

Teacher Incharge: Ms. Richa

Month	Week	Topics to be covered
July	25.07.2024-31.07.2024	Sets and their representations, Empty set,
August	01.08.2024– 10.08.2024	Finite and infinite sets, Subsets, Equal sets, Power sets, Universal set, Union and intersection of sets, Difference of two sets
	12.08.2024– 17.08.2024	Complement of a set, Venn diagram, De-Morgan's laws and their applications.
	19.08.2024– 24.08.2024	An introduction to matrices and their types, Operations on matrices,
	26.08.2024– 31.08.2024	Symmetric and skew-symmetric matrices, Minors, Co-factors. Determinant of a square matrix Assignment of Matrix and its Types
September	02.09.2024 –07.09.2024	Adjoin and inverse of a square matrix, Solutions of a system of linear equations up to order 3.
	09.09.2024 –14.09.2024	Quadratic equations, Solution of quadratic equations. Arithmetic progression
	16.09.2024 –21.09.2024	Geometric progression, Harmonic progression, Arithmetic mean (A.M.), Geometric mean (G.M.)
	23.09.2024 –30.09.2024	Harmonic mean (H.M.), Relation between A.M., G.M. and H.M.
October	01.10.2024– 05.10.2024	The concept of differentiation, differentiation of simple functions,
	07.10.2024– 12.10.2024	Problems involving formulation and solution of quadratic equations in one variable
	14.10.2024– 19.10.2024	Use of differentiation for solving problems related to real-life situations
	21.10.2024– 26.10.2024	Test of unit I and II
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.24-06.11.24	Problems to find first derivatives of functions
	06.11.24- 09.11.24	Differentiation of simple algebraic, trigonometric and exponential functions
	09.11.24-16.11.24	Problems based on De Morgan's Laws. Problems related to Venn diagrams.
	17.11.24-24.11.24	Problems to find inverse of a matrix. Problems to find determinant of a square matrix
	25.11.24-onwards	--------------- University Examination -------------------

LESSON PLAN

Session: 2024-2025   **Class: B.B.A- I – 1st Semester**

Subject: Business Mathematics-I   **Paper Code: 104**

Teacher Incharge: Ms. Richa

Month	Week	Topics to be covered
July	25.07.2024-31.07.2024	Set Theory: Representation of sets, equivalent sets, power set
August	01.08.2024– 10.08.2024	complement of a set. Venn Diagrams: Union and Intersection of sets.
	12.08.2024– 17.08.2024	Quadratic Equations with real roots
	19.08.2024– 24.08.2024	Relations between roots and coefficient of the quadratic equations
	26.08.2024– 31.08.2024	Problem related to set theory and equivalent sets.
September	02.09.2024 –07.09.2024	Methods of solving a quadratic equation
	09.09.2024 –14.09.2024	Methods- factoring, using the quadratic formula Completing the square.
	16.09.2024 –21.09.2024	Binomial Theorem (positive index)
	23.09.2024 –30.09.2024	Test of unit I and II
October	01.10.2024– 05.10.2024	Properties of Limits and function
	07.10.2024– 12.10.2024	Practice sum of limit and function
	14.10.2024– 19.10.2024	Matrix System: Matrices, definition
	21.10.2024– 26.10.2024	Basic operations on matrices (Addition and multiplication)
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.24-06.11.24	Properties of Determinants, calculation of value of determinants upto third order.
	06.11.24- 09.11.24	Determinant of a square matrix,
	09.11.24-16.11.24	Inverse of a square matrix, Cramer's rule
	17.11.24-24.11.24	Assignment and test series
	25.11.24-onwards	---------------- University Examination --------------------

LESSON PLAN

Session: 2024-2025   **Class: B.Sc. (MDC) – 1st Semester**

Subject: Introductory Mathematics   **Paper Code: B23-MAT-104**

Teacher Incharge: Ms. Simranjot

Month	Dates	Topics to be covered
August	21.08.2024– 25.08.2024	Sets and their respresentation , Empty ,Finite and infinite sets , Subsets ,Equal sets ,Power sets ,Universal set ,
	26.08.2024– 31.08.2024	Union and intersection of set, Difference of two sets, Complement of a set Venn diagram, De-Morgan's law and their applications.
September	02.09.2024 – 07.09.2024	An introduction to matrices and their types, Operations on matrices, Symmetric and skew-symmetric matrices, Minors, Co-factors. Determine of a square matrix Adjoint and inverse of a square matrix
	09.09.2024 – 14.09.2024	Solutions of a system of linear equation up to order 3. Complex numbers, Operations on complex number.
	16.09.2024 – 21.09.2024	Linear inequalities Algebraic solution of linear inequalities in two variables and their graphical representation. Quadratic equations, Solution of Quadratic equations.
	23.09.2024 – 30.09.2024	Arithmetic progression, Geometric progression, Harmonic progression Arithmetic mean (A.M)
October	01.10.2024– 05.10.2024	Geometric mean(G.M), Harmonic mean(H.M), Relation between A.M, G.M and G.M.Revision Test
	07.10.2024– 12.10.2024	Straight lines: slope of a line and angle between two lines, Different form of a equation of a line,
	14.10.2024– 19.10.2024	Parallel to co-ordinates axes, Point-slope form
	21.10.2024– 26.10.2024	Different form of a equation of a line. Revision And test series
	27.10.2024– 03.11.2024	Diwali Vacations
November	04.11.2024– 09.11.2024	Slope-Intercept form, Two-point form General form
	11.11.2024– 16.11.2024	Distance of a point from straight line, standard form of circle and its properties.
	18.11.2024– 23.11.2024	Revision And test series
	25.11.2024 onwards	---------------- University Examination --------------------