

GOVT. COLLEGE FOR JATUSANA (REWARI)

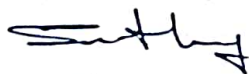
Lesson Plan (Session 2023-24)

Assistant Professor: Mr Sumit Kumar

Class:-B.Com. -I Year (1st Sem)

Subject: Mathematics

January	
Week 3	Permutations
Week 4	Combinations
February	
Week 1	Binomial Theorem, Graphical solution of linear inequalities in two variables
Week 2	Solution of a system of linear inequalities in two variables
Week 3	Formulation of equations, Graphical method of solution
Week 4	Problem relating to two variables including the case of mixed constraints, the case has no solution
March	
Week 1	Unbounded solution and redundant constraints
Week 2	Data- introduction, classification, and tabulation
Week 3	Diagrammatic representation of Data, significance of diagrams and graphs
Week 4	Type of diagrams: Bar diagram, Pie chart, Pie chart, Pictographs
April	
Week 1	Examples
Week 2	Graphs of time series or line graphs, graphs of frequency distribution: Histogram, frequency polygon
Week 3	Ogives or cumulative frequency curves, limitations of diagrams and graphs
Week 4	Revision



Sumit Kumar

Assistant Professor (Mathematics)

GOVT. COLLEGE JATUSANA (REWARI)

Lesson Plan	2023-2024	Class & Section	B.A. I (1 st Sem)
Name of Paper	Mathematics (Calculus)	Assistant Professor	Mr. Sumit Kumar

July	
Week 4	Definition of the limit of a function, Basic properties of limits, Continuous functions and classification of discontinuities
August	
Week 1	Differentiability, Successive differentiation, Leibnitz theorem, Maclaurin and Taylor series expansions
Week 2	Asymptotes in Cartesian coordinates, the intersection of the curve and its asymptotes
Week 3	Asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves
Week 4	Newton's method, Radius of curvature for pedal curves, Tangential polar equations, Centre of Curvature, Circle of Curvature
September	
Week 1	Chord of curvature, evolutes, Tests for concavity and convexity, Points of inflexion, Multiple points, Cusps, nodes & conjugate points, Type of cusps
Week 2	Tracing of curves in Cartesian, parametric and polar coordinates
Week 3	Reduction formulae
Week 4	Rectification, intrinsic equations of curve
October	
Week 1	Quadrature (area) Sectorial area
Week 2	Area bounded by closed curves
Week 3	Volumes and surfaces of solids of revolution
Week 4	Theorems of Pappu's and Guilden
November	
Week 1	Revision
Week 2	Revision
Week 3	Paper Discussion
Week 3	Paper Discussion



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Assistant Professor of Mathematics

GOVT. COLLEGE JATUSANA (REWARI)

Lesson Plan	2023-2024	Class & Section	B.A. I (1 st Sem)
Name of Paper	Mathematics (Solid Geometry)	Assistant Professor	Mr. Sumit Kumar

July	
Week 4	General equation of second degree, Tracing of conics
August	
Week 1	Tangent at any point to the conic, pole of line to the conic, director circle of conic, System of conics
Week 2	Confocal conics
Week 3	Polar equation of a conic, tangent and normal to the conic
Week 4	Sphere: Plane section of a sphere. Sphere through a given circle. Intersection of two spheres
September	
Week 1	radical plane of two spheres. Co-axial system of spheres Cones. Right circular cone, enveloping cone and reciprocal cone
Week 2	Cylinder: Right circular cylinder and enveloping cylinder
Week 3	Central Conicoids: Equation of tangent plane. Director sphere
Week 4	Normal to the conicoids. Polar plane of a point
October	
Week 1	Enveloping cone of a conicoid. Enveloping cylinder of a conicoid
Week 2	Paraboloids: Circular section
Week 3	Plane sections of conicoids
Week 4	Generating lines. Confocal conicoid
November	
Week 1	Reduction of second-degree equations
Week 2	Revision
Week 3	Paper Discussion



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GOVT. COLLEGE JATUSANA (REWARI)

Lesson Plan	2023-2024	Class & Section	B.A. I (1 st Sem)
Name of Paper	Mathematics (Algebra)	Assistant Professor	Mr. Sumit Kumar

July	
Week 4	Definition and types of matrices-types with examples, Rank of a matrices, Inverse of a matrix, Linear dependence and independence of rows and columns of matrices
August	
Week 1	Row rank and column rank of a matrix, Rank of a matrices, Inverse of a matrix Eigenvalues, eigenvectors and the characteristic equation of a matrix
Week 2	Minimal polynomial of a matrix, Cayley Hamilton theorem and its use in finding the inverse of a matrix
Week 3	Applications of matrices to a system of linear (both homogeneous and non-homogeneous equations)
Week 4	Theorems on consistency of a system of linear equations
September	
Week 1	Unitary and Orthogonal Matrices, Bilinear and Quadratic forms
Week 2	Relations between the roots and coefficients of general polynomial equation in one variable
Week 3	Solutions of polynomial equations having conditions on roots,
Week 4	
October	
Week 1	Common roots and multiple roots
Week 2	Transformation of equations
Week 3	Nature of the roots of an equation Descarte's rule of signs
Week 4	Solutions of cubic equations (Cardon's method)
November	
Week 1	Biquadratic equations and their solutions
Week 2	Revision
Week 3	Paper Discussion
Week 3	Paper Discussion



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GOVT. COLLEGE JATUSANA (REWARI)

Lesson Plan	2023-2024	Class & Section	B.A. I (1 st Sem)
Name of Paper	Mathematics (Advanced Calculus)	Assistant Professor	Mr. Sumit Kumar

July	
Week 4	Continuity, Sequential Continuity, properties of continuous, function, chain rule of differentiability, Mean value theorems, Rolle's theorems
August	
Week 1	Theorem and Lagrange's mean value theorem and their geometrical interpretations
Week 2	Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms
Week 3	Limit and continuity of real valued functions of two variables, Partial differentiation
Week 4	Total Differentials; Composite functions & implicit functions. Change of variables
September	
Week 1	Differentiability of real valued functions of two variables. Schwarz and Young's theorem
Week 2	Homogenous functions & Euler's theorem on homogeneous functions, Taylor's theorem for functions of two variables
Week 3	Implicit function theorem, Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers
Week 4	Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae
October	
Week 1	Locus of the centre of curvature, Spherical curvature
Week 2	Surfaces: Tangent planes
Week 3	Locus of centre of Spherical curvature, Involutives, evolutes, Bertrand Curves
Week 4	one parameter family of surfaces, Envelopes
November	
Week 1	Revision
Week 2	Revision
Week 3	Paper Discussion
Week 3	Paper Discussion



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GOVT. COLLEGE JATUSANA (REWARI)

Lesson Plan	2023-2024	Class & Section	B.A. I (5 th Sem)
Name of Paper	Mathematics (Statics)	Assistant Professor	Mr. Sumit Kumar

July	
Week 4	Basic Introduction, Composition and resolution of forces
August	
Week 1	Parallel forces
Week 2	Moments and Couples
Week 3	Analytical conditions of equilibrium of coplanar forces
Week 4	Friction
September	
Week 1	Centre of Gravity
Week 2	Virtual work
Week 3	Forces in three dimensions
Week 4	Poinsots central axis
October	
Week 1	Wrenches
Week 2	Null lines and planes
Week 3	Stable and unstable equilibrium
Week 4	Stable and unstable equilibrium
November	
Week 1	Revision
Week 2	Revision
Week 3	Paper Discussion
Week 3	Paper Discussion



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GOVT. COLLEGE JATUSANA (REWARI)

Lesson Plan	2023-2024	Class & Section	B.A. I (2 nd Sem)
Name of Paper	Mathematics (PDEs)	Assistant Professor	Mr. Sumit Kumar

July	
Week 4	Partial differential equations: Formation, order and degree, Linear and Non-Linear Partial
August	
Week 1	differential equations of the first order
Week 2	Solution of Lagrange's linear equations, Charpit's general method of solution
Week 3	Compatible systems of first order equations, Jacobi's method
Week 4	Linear partial differential equations of second and higher orders, Linear and non-linear homogenous and non-homogenous equations with constant co-efficients
September	
Week 1	Partial differential equation with variable co-efficients reducible to equations with constant coefficients
Week 2	complimentary functions and particular Integrals, Equations reducible to linear equations with constant co-efficients
Week 3	Classification of linear partial differential equations of second order, Hyperbolic, parabolic and elliptic types
Week 4	Reduction of second order linear partial differential equations to Canonical (Normal) forms and their solutions
October	
Week 1	Solution of linear hyperbolic equations, Monge's method for partial differential equations of second order
Week 2	Cauchy's problem for second order partial differential equations, Characteristic equations and characteristic curves of second order partial differential equation
Week 3	Method of separation of variables: Solution of Laplace's equation, Wave equation (one and two dimensions)
Week 4	Diffusion (Heat) equation (one and two dimension) in Cartesian Co-ordinate system
November	
Week 1	Diffusion (Heat) equation (one and two dimension) in Cartesian Co-ordinate system
Week 2	Revision
Week 3	Paper Discussion
Week 3	Paper Discussion



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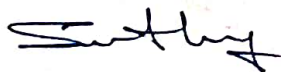
Lesson Plan (Session 2023-24)

Assistant Professor: Mr Sumit Kumar

Class:-B.A. -I Year (2nd Sem)

Subject: Mathematics (Vector Calculus)

January	
Week 3	Scalar and vector product of three vectors, product of four vectors
Week 4	Reciprocal vectors. Vector differentiation
February	
Week 1	Scalar Valued point functions, vector-valued point functions, derivatives along a curve, directional derivatives
Week 2	Gradient of a scalar point function, geometrical interpretation of grad, the character of gradient as a point function
Week 3	Divergence and curl of vector point function, characters of $\text{Div } f$ and $\text{Curl } f$ as point function, examples
Week 4	Gradient, divergence, and curl of sums and product and their related vector identities. Laplacian operator
March	
Week 1	Orthogonal curvilinear coordinates Conditions for orthogonality fundamental triad of mutually orthogonal unit vectors
Week 2	Gradient, Divergence, Curl, and Laplacian operators in terms of orthogonal curvilinear coordinates
Week 3	Cylindrical coordinates and Spherical coordinates
Week 4	Vector integration; Line integral, Surface integral
April	
Week 1	Volume integral. Theorems of Gauss
Week 2	Green & Stokes and problems based on these theorems
Week 3	Revision
Week 4	Revision



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Lesson Plan (Session 2023-24)

Assistant Professor: Mr Sumit Kumar

Class:-B.A. -I Year (4th Sem)

Subject: Mathematics (Special Function and Integral Transforms)

January	
Week 3	Series Solution of differential equations Power series method, Definition of Beta and Gamma functions
Week 4	Bessel equation and its solution, Bessel functions and their properties- Convergence
February	
Week 1	Recurrence relations and Generating functions, Orthogonality of Bessel functions
Week 2	Legendre and Hermite differential equations and their solutions. Legendre and Hermite's function and their properties
Week 3	Recurrence relations and generating functions. Orthogonality of Legendre and Hermite's polynomials
Week 4	Rodrigues' Formula for Legendre and Hermite polynomials, Laplace Integral Representation of Legendre polynomial
March	
Week 1	Laplace Transforms: Existence theorem for Laplace Transform, Linearity of the Laplace transforms
Week 2	Laplace transforms of derivatives and integrals, Differentiation and Integration of Laplace transforms, Convolution theorem
Week 3	Inverse Laplace transforms, Convolution theorem, Inverse Laplace transforms of derivatives and integrals, Solution of ordinary derivatives and integrals using Laplace transforms
Week 4	Fourier transforms: Linearity property, Shifting, Modulation, Convolution theorem
April	
Week 1	Fourier transforms of derivatives, Relation between Fourier transforms and Laplace transforms
Week 2	Parseval's identity for Fourier transforms, Solution of differential equations using Fourier transforms
Week 3	Revision
Week 4	Revision



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Lesson Plan (Session 2023-24)

Assistant Professor: Mr Sumit Kumar

Class:-B.A. -I Year (4th Sem)

Subject: Mathematics (Sequences and Series)

January	
Week 3	Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighborhoods, interior points, isolated points, limit points
Week 4	open sets, closed set, interior of a set, closure of a set in real numbers and their properties. Bolzano-Weierstrass theorem
February	
Week 1	Open covers, Compact sets, and Heine-Borel Theorem
Week 2	Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence
Week 3	Subsequences, Subsequential limits, Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series
Week 4	Cauchy's general principle of Convergence of series, Convergence, and divergence of geometric series, Hyper Harmonic series, or p-series
March	
Week 1	Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test
Week 2	de Morgan and Bertrand's test, Cauchy's Nth root test, Gauss Test
Week 3	Cauchy's integral test, Cauchy's condensation test
Week 4	Alternating series, Leibnitz's test, absolute and conditional convergence, Arbitrary series: Abel's lemma, Abel's test
April	
Week 1	Dirichlet's test
Week 2	Insertion and removal of parenthesis, re-arrangement of terms in a series, Dirichlet's theorem, Riemann's Re-arrangement theorem
Week 3	Revision
Week 4	Revision



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Lesson Plan (Session 2023-24)

Assistant Professor: Mr Sumit Kumar

Class:-B.A. -I Year (4th Sem)

Subject: Mathematics (Programming in C and Numerical Methods)

January	
Week 3	Programmer's model of a computer, algorithms, flow charts, data types
Week 4	Operators and expressions, input/outputs functions, decisions control structure: decision statements, logical and conditional statements
February	
Week 1	Implementation of loops, switch statement & case-control structures
Week 2	functions, preprocessors, and arrays
Week 3	strings: character data type, standard string handling functions
Week 4	arithmetic operations on characters. structures: definition, using structures, use of structures in arrays and arrays in structures
March	
Week 1	pointers: pointers data type, pointers and arrays, pointers and functions
Week 2	solution of algebraic and transcendental equations: Bisection method
Week 3	Regula-falsi method, Secant method, Newton-Raphson's method. Newton's Iterative method for finding pth root of a number, order of convergence of the above methods
Week 4	simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method, Triangularization method (LU-decomposition method)
April	
Week 1	Crout's method, Cholesky's Decomposition method, iterative method
Week 2	Jacobi's method, Gauss-Seidal's method, Relaxation method
Week 3	Revision
Week 4	Revision



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Lesson Plan (Session 2023-24)

Assistant Professor: Mr Sumit Kumar

Class:-B.A. -I Year (2nd Sem)

Subject: Mathematics (Ordinary Differential Equations)

January	
Week 3	Geometrical meaning of a differential equation, exact differential equations
Week 4	integrating factors, first-order higher degree equations solvable for x,y,p Lagrange's equations
February	
Week 1	Clairaut's equations, equations reducible to Clairaut's form, singular solutions
Week 2	orthogonal trajectories: in cartesian coordinates and polar coordinates. self-orthogonal family of curves
Week 3	Linear differential equations with constant coefficients, Homogeneous linear ordinary differential equations
Week 4	Equations reducible to homogeneous, Linear differential equations of second order: Reduction to normal form
March	
Week 1	Transformation of the equation by changing the dependent variable/ the independent variable, Solution by operators of non-homogeneous linear differential equations
Week 2	Reduction of the order of a differential equation. Method of variations of parameters. Method of undetermined coefficients
Week 3	Ordinary simultaneous differential equations. Solution of simultaneous differential equations involving operators $x (d/dx)$ or $t (d/dt)$ etc
Week 4	Simultaneous equation of the form $dx/P = dy/Q = dz/R$
April	
Week 1	Total differential equations. Condition for $Pdx + Qdy + Rdz = 0$ to be exact
Week 2	General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant
Week 3	Method of auxiliary equations
Week 4	



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Lesson Plan (Session 2023-24)

Assistant Professor: Mr Sumit Kumar

Class:-B.A. -I Year (2nd Sem)

Subject: Mathematics (Number Theory And Trigonometry)

January	
Week 3	Divisibility, G.C.D (Greatest common Divisors), L.C.M.
Week 4	Primes, Fundamental theorem of Arithmetic, Linear Congruence
February	
Week 1	Fermat's theorem, Wilson's theorem, and its converse, Linear Diophantine equation in two variables
Week 2	Complete Residue System and Reduced Residue System, modulo m . Euler ϕ function
Week 3	Euler's Generalization of Fermat's theorem
Week 4	Chinese Remainder Theorem, Quadratic Residues, Legendre Symbols, Lemma of Gauss; Gauss Reciprocity Law
March	
Week 1	Greatest integer function [], The number of divisors, and the sum of divisors of a natural number. Moebius Function and Moebius Inversion Formula
Week 2	De-Moivre's theorem and its applications
Week 3	Expansion of trigonometrical functions
Week 4	Direct circular and Hyperbolic functions and their properties
April	
Week 1	Inverse circular and Hyperbolic functions and their properties
Week 2	Logarithm of a complex quantity
Week 3	Gregory's series, Summation of Trigonometric series
Week 4	Revision



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