

LESSON PLAN

Session 2023-24

Subject- Mathematics
Paper- Calculus

Class- B.A. Ist Year (Sem.-I)
Period- I

24 July 2023 to 18 August 2023

Epsilon- delta definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions & Practicals.

19 August 2023 to 10 September 2023

Asymptotes : Horizontal, Vertical and oblique asymptotes for algebraic curves , intersection of curve and its asymptotes, asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. Newton's method. Radius of curvature for pedal curves. Centre of curvature. Circle of curvature & Practicals.

11 September 2023 to 09 October 2023

Multiple points, Node, Cusp, Conjugate point, Tests for concavity and convexity. Points of inflexion Tracing of curves in Cartesian, parametric and polar co-ordinates, Reduction formulae & Practicals.


10 October 2023 to 20 November 2023

Rectification, intrinsic equations of curve , Quadrature , Area bounded by closed curves. Volumes and surfaces of solids of revolution & Practicals and one class Test.

21 November 2023 to 27 November 2023

Revision


Principal
GOVT COLLEGE
REHRAMPUR (Bapaul)


PARVESH RANGA
(Assistant Professor in Mathematics)

Lesson Plan of Mathematics Paper CC/ B23-MAT-101

LESSON PLAN

Session 2023-24

Subject- Mathematics
Paper- Numerical Analysis

Class- B.A. IIIrd Year(Sem.-V)
Period-III

24 July 2023 to 18 August 2023

Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values, Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae. Interpolation with unequal intervals: Newton's divided difference, Lagrange's Interpolation formulae, Hermite Formula.

19 August 2023 to 10 September 2023

Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula. Probability distribution of random variables, Binomial distribution, Poisson's distribution, Normal distribution: Mean, Variance and Fitting. and practicals.

11 September 2023 to 09 October 2023

Numerical Differentiation: Derivative of a function using interpolation formulae as studied in Sections -I & II. Eigen Value Problems: Power method, Jacobi's method, Given's method, House-Holder's method, QR method, Lanczos method. and one class Test and practicals.


10 October 2023 to 20 November 2023

Numerical Integration: Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's one- third and three-eighth rule, Chebychev formula, Gauss Quadrature formula. Numerical solution of ordinary differential equations: Single step methods- Picard's method. Taylor's series method, Euler's method, Runge-Kutta Methods. Multiple step methods; Predictor-corrector method, Modified Euler's method, Milne-Simpson's method.

21 November 2023 to 27 November 2023

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PARVESH RANGA
(Assistant Professor in Mathematics)

Lesson Plan of Mathematics Paper BM353

LESSON PLAN

Session 2023-24

Subject- Mathematics
Paper- Partial Differential Equation

Class- B.A. IInd Year(Sem.-III)
Period-5th

24 July 2023 to 18 August 2023

Partial differential equations: Formation, order and degree, Linear and Non-Linear Partial differential equations of the first order: Complete solution, singular solution, General solution, Solution of Lagrange's linear equations, Charpit's general method of solution. Compatible systems of first order equations, Jacobi's method.

19 August 2023 to 10 September 2023

Linear partial differential equations of second and higher orders, Linear and Non-linear homogenous and non-homogenous equations with constant co-efficients, Partial differential equation with variable co-efficients reducible to equations with constant coefficients, their complementary functions and particular Integrals, Equations reducible to linear equations with constant co-efficients .

11 September 2023 to 09 October 2023

Classification of linear partial differential equations of second order, Hyperbolic, parabolic and elliptic types, Reduction of second order linear partial differential equations to Canonical (Normal) forms and their solutions, Solution of linear hyperbolic equations, Monge's method for partial differential equations of second order **and one class Test.**

10 October 2023 to 20 November 2023

Cauchy's problem for second order partial differential equations, Characteristic equations and characteristic curves of second order partial differential equation, Method of separation of variables: Solution of Laplace's equation, Wave equation (one and two dimensions), Diffusion (Heat) equation (one and two dimension) in Cartesian Coordinate system.

21 November 2023 to 27 November 2023

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PARVESH RANGA

(Assistant Professor in Mathematics)

Lesson Plan of Mathematics Paper BM232

LESSON PLAN

Session 2023-24

Subject- Mathematics
Paper- Statics

Class- B.A. IInd Year (Sem.-III)
Period-6th

24 July 2023 to 18 August 2023

Composition and Resolution of forces. Parallel forces. Moments and Couples.

19 August 2023 to 10 September 2023

Analytical conditions of equilibrium of coplanar forces. Friction. Centre of Gravity.

11 September 2023 to 09 October 2023

Virtual work. Forces in three dimensions. Poinso's central axis and one class Test.

10 October 2023 to 20 November 2023

Wrenches. Null lines and planes. Stable and Unstable equilibrium.

21 November 2023 to 27 November 2023

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PARVESH RANGA

(Assistant Professor in Mathematics)



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LESSON PLAN

Session 2023-24

Subject- Mathematics
Paper- Algebra & Number Theory

Class- BA 1st Year (Sem.-II)
Period- I (09:00-10:00)

15 February 2024 to 13 March 2024

Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices. Elementary Operations on matrices. Rank of a matrices. Inverse of a matrix. Linear dependence and independence of rows and columns of matrices. Row rank and column rank of a matrix. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix. Cayley Hamilton theorem and its use in finding the inverse of a matrix, Unitary and Orthogonal Matrices.

14 March 2024 to 03 April 2024

Relations between the roots and coefficients of general polynomial equation in one variable. Solutions of polynomial equations having conditions on roots. Common roots and multiple roots, Transformation of equations, Nature of the roots of an equation Descarte's rule of signs **and one class Test.**

04 April 2024 to 21 April 2024

Solutions of cubic equations(Cardon's method), Biquadratic equations and their solutions. Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple), Primes, Fundamental Theorem of Arithemetic.**and one class Test.**

22 April 2024 to 10 May 2024

Linear Congruences, Fermat's theorem. Wilson's theorem and its converse. Linear Diophanatine equations in two variables , Chinese Remainder Theorem

11 May 2024 to 15 May 2024

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PARVESH RANGA

(Assistant Professor in Mathematics)

Lesson Plan of Mathematics Paper CC/ B23-MAT-201

LESSON PLAN

Session 2023-24

Subject- Mathematics
Paper- Dynamics

Class- B.A. III Year (Sem.-VI)
Period-III

2 January 2024 to 31 January 2024

Velocity and acceleration along radial, transverse, tangential and normal directions.
Relative velocity and acceleration. Simple harmonic motion. Elastic strings.

1 February 2024 to 29 February 2024

Mass, Momentum and Force. Newton's laws of motion. Work, Power and Energy.
Definitions of Conservative forces and Impulsive forces.

1 March 2024 to 22 March 2024

Motion on smooth and rough plane curves. Projectile motion of a particle in a plane.
Vector angular velocity.

23 March 2024 to 20 April 2024

General motion of a rigid body. Central Orbits, Kepler laws of motion. Motion of a
particle in three dimensions. Acceleration in terms of different co-ordinate systems.

21 April 2024 to 30 April 2024

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LESSON PLAN

Session 2023-24

Subject- Mathematics

Paper- Special functions & Integral transform

Class- B.A. 2nd Year(Sem.-IV)
Period- 5th

2 January 2024 to 31 January 2024

Series solution of differential equations – Power series method, Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties-Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions.

1 February 2024 to 29 February 2024

Legendre and Hermite differentials equations and their solutions: Legendre and Hermite functions and their properties-Recurrence Relations and generating functions. Orthogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials, Laplace Integral Representation of Legendre polynomial.

1 March 2024 to 22 March 2024

Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms, Convolution theorem, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals, solution of ordinary differential equations using Laplace transform.

23 March 2024 to 20 April 2024

Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem, Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms, solution of differential Equations using Fourier Transforms.

21 April 2024 to 30 April 2024

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PARVESH RANGA
(Assistant Professor in Mathematics)

Lesson Plan of Mathematics Paper BM242

LESSON PLAN

Session 2023-24

Subject- Mathematics

Paper- Programming in C & Numerical Analysis

Class- B.A. 2nd Year (Sem.-IV)
Period-6th

2 January 2024 to 31 January 2024

Programmer's model of a computer, Algorithms, Flow charts, Data types, Operators and expressions, Input / outputs functions.

1 February 2024 to 29 February 2024

Decisions control structure: Decision statements, Logical and conditional statements, Implementation of Loops, Switch Statement & Case control structures, Functions, Preprocessors and Arrays.

1 March 2024 to 22 March 2024

Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters. Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures. Pointers: Pointers Data type, Pointers and Arrays, Pointers and Functions. Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Newton-Raphson's method. Newton's iterative method for finding pth root of a number, Order of convergence of above methods.

23 March 2024 to 20 April 2024

Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method, Triangularization method (LU decomposition method). Crout's method, Cholesky Decomposition method. Iterative method, Jacobi's method, Gauss-Seidal's method, Relaxation method.

21 April 2024 to 30 April 2024

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Lesson Plan of Mathematics Paper BM243