LESSON PLAN

SESSION (2025-2026)

subject : Mathematics class: B.SC/B.A 2nd year

Paper : Differential Equations Sem : iii

23 July to 17 August,2025

Unit-I: Basic concepts and genesis of ordinary differential equations, Order and degree of a differential equation, Differential equations of first order and first degree, Equations in which variables are separable, Homogeneous equations, equations reducible to homogeneous, Linear differential equations and equations reducible to linear form. Exact differential equations, Integrating factor. First order higher degree equations solvable for x, y and p. Clairaut's form and singular solutions..

18 August,2025 to 12 September 2025

Unit-II: Solutions of homogeneous linear ordinary differential equations of second order with constant coefficients, linear non-homogeneous differential equations. Linear differential equation of second order with variable coefficients. Method of reduction of order, method of variation of parameters. Cauchy-Euler equation.

13 September 2025 to 16 October,2025

Unit-III: Solution of simultaneous differential equations, total differential equations. Genesis of Partial differential equations (PDE), Concept of linear and non-linear PDEs. 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 $q=\partial z/\partial y$.

17 October,2025 to 23 November,2025

Unit-IV: Second Order Partial Differential Equations with Constant Coefficients. Integral surfaces passing through a given curve. Surfaces orthogonal to a given system of surfaces. Compatible systems of first order equations. Charpit's method, Special types of first order PDEs, Jacobi's method. Solutions of second order linear partial differential equations (homogeneous and non-homogeneous) with constant coefficients.

Suman

Assistant Professor Mathematics

LESSON PLAN

SESSION (2025-2026)

subject : Mathematics class: B.SC/B.A 2nd year

Paper : Analytical Geometry & Vector Calculus sem : iv

January

General equation of second degree: Classification of conic sections; centre, asymptotes, axes, eccentricity, foci and directrices of conics. Tangent at any point to a conic, chord of contact, pole of line to a conic, director circle of a conic. Polar equation of a conic, tangent and normal to a conic, confocal conics.

February

Sphere: General form, Plane section of a sphere. Sphere through a given circle. Intersection of two spheres, tangent plane and line, polar plane and line, orthogonal spheres, radical plane of two spheres and co-axal system of spheres. Cone: Equation of a cone, right circular cone, quadric cone, enveloping cone. Tangent plane and condition of tangency.

March

Cylinder: Right circular cylinder and enveloping cylinder. Central Conicoids: Equation of tangent plane. Director sphere. Normal to the conicoids. Polar plane of a point. Enveloping cone of a conicoid, Enveloping cylinder of a conicoid, confocal conicoid, reduction of second degree equations.

April

Scalar and Vector product of three vectors, four vectors, reciprocal vectors, vector differentiation and derivative along a curve, directional derivatives; Gradient of a scalar point function, divergence and curl of vector point functions, their geometrical meanings and vector identities. Vector integration: line integral, surface integral and volume integral. Theorem of Gauss, Green, Stoke and problems based on these.

Suman
Assistant Professor Mathematics

LESSON PLAN

SESSION (2025-2026)

subject : Mathematics class: BBA

Paper : BUSINESS MATHEMATICS -II Sem : II

January

Average, Ratio and Proportion, Percentage, Profit and Loss, Commission, Discount, Broke.

February

Simple interest and compound interest. Annuities: Types of annuities, Present value and amount of an annuity (including the case of continuous compounding), Valuation of simple loans and debentures, Problems related to sinking funds.

March

Indices & logarithms, arithmetic and geometric progressions and their business applications; sum of first n natural numbers, sum of squares and cubes of first n natural numbers.

April

Linear Programming: Formulation of linear programming problems (LPP) and their solution by graphical and simplex methods. Applications of linear programming in solving business problems.

Suman

Assistant Professor Mathematic

LESSON PLAN

SESSION (2025-2026)

subject : Mathematics class: B.SC/B.A 3rd year

Paper : Numerical Analysis Sem : Vi

January

Round-off error and computer arithmetic, Local and global truncation errors, Algorithms and convergence. Numerical methods for solving algebraic and transcendental Equations: Bisection method, false position method, fixed point iteration method, Newton-Raphson method and secant method. Newton's iterative method for finding pth root of a number.

February

Unit-II: Numerical methods for solving simultaneous linear equations: Gauss-elimination method, GaussJordan method, Triangularization method (LU decomposition method). Crout's method, 9675 Cholesky Decomposition method. Iterative method; Jacobi's method, Gauss-Seidal method, relaxation method.

March

Unit-III: Finite Differences operators and their relations. Interpolation with equal intervals: Gregory– Newton forward and backward difference interpolations. Interpolation with unequal intervals: Newton's divided difference formulae, Lagrange's Interpolation formulae. Central Differences: Gauss forward and Gauss's backward interpolation formulae. Sterling formula, Bessel's formula. Piecewise linear interpolation, Cubic spline interpolation. Numerical Differentiation: First and second derivative of a function using interpolation formulae.

April

Unit-IV: Numerical Integration: Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's onethird 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.

Suman

Assistant professor Mathematics