Lesson Plan for Session 2023-2024 (Jan 2024- April 2024)

Name- Dr Ravindra Yadav

Class- BSc. I + B.A I (Even Semester)

Paper- Ordinary Differential Equations

Week 1	Geometrical meaning of a differential equation. Exact differential equations
Week 2	Integrating factors, First order higher degree equations solvable for x,y Lagrange's equations
Week 3	First order higher degree equations solvable for p Lagrange's equations, Clairaut's equations. Equation reducible to Clairaut's form. Singular solutions, Class Test Chapter 1 .
Week 4	Orthogonal trajectories: in Cartesian coordinates and polar coordinates
Week 5	Self orthogonal family of curves.. Linear differential equations with constant coefficients, Assignment.
Week 6	Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations, Class Test .
Week 7	Equations reducible to homogeneous linear ordinary differential equations, Linear differential equations of second order- Reduction to normal form
Week 8	Transformation of the equation by changing the dependent variable/ the independent variable. Solution by operators of non-homogeneous linear differential equations, Class Test.
Week 9	Reduction of order of a differential equation. Method of variations of parameters. Method of undetermined coefficients, Assignment.
Week 10	Ordinary simultaneous differential equations. Solution of simultaneous differential equations involving operators x (d/dx) or t (d/dt) etc.

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	Simultaneous equation of the form dx/P = dy/Q = dz/R.
Week 11	Total differential equations. Condition for Pdx + Qdy +Rdz = 0 to be exact.
Week 12	General method of solving Pdx + Qdy + Rdz = 0 by taking one variable constant, Class Test
Week 13	Method of auxiliary equations.
Week 14	Revision and Doubt Class.
Week 15	Revision & Class test

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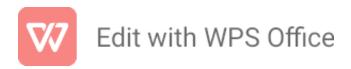
Name : Dr Ravindra Yadav

Class :BSc. II + BA II(Even Semester)

Paper : Special Functions and Integral Transforms

Week 1	Series solution of differential equations – Power series method
Week 2	Power series method,Examples, Definitions of Beta and Gamma functions.
Week 3	Examples Related to Beta and Gamma functions, Bessel functions and their properties-Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions.
Week 4	Legendre differentials equations and their solutions: Legendre functions and their properties-Recurrence Relations and generating functions. Orhogonality of Legendre polynomials. Rodrigues' Formula for Legendre Polynomials, Laplace Integral Representation of Legendre polynomial. Class Test
Week 5	Hermite differentials equations and their solutions,Hermite functions and their properties-Recurrence Relations and generating functions. Orhogonality of Hermite polynomials. Rodrigues' Formula for Hermite Polynomials, Examples. Assignment1.
Week 6	Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals.
Week 7	Differentiation and integration of Laplace transforms, Convolution theorem
Week 8	Inverse Laplace transforms, convolution theorem
Week 9	Inverse Laplace transforms of derivatives and

	integrals, solution of ordinary differential equations using Laplace transform.Class Test.
Week 10	Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem, Related Examples, Assignment
Week 11	Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms, Examples
Week 12	Solution of differential Equations using Fourier Transforms, Examples.
Week 13	Doubt Classes, Revision & Assignment.
Week 14	Test & Revision
Week 15	Revision & Full Syllabus Test.

Lesson Plan for Session 2023-2024 (Jan 2024- April 2024)

Name: Dr Ravindra Yadav (Mathematics)

Class: B.A.- II+ BSc II (Even Semester)

Paper: Programming in C and Numerical Methods

Week 1	Programmer's model of a computer, Algorithms, Flow charts
Week 2	Data types, Operators and expressions, Input / outputs functions.
Week 3	Decisions control structure: Decision statements, Logical and conditional statements, Implementation of Loops.
Week 4	Switch Statement & Case control structures. Functions, Preprocessors and Arrays. Assignment 1
Week 5	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.
Week 6	Pointers Data type, Pointers and Arrays, Pointers and Functions. Solution of Algebraic and Transcendental equations by Bisection method,Assignment and Class test .
Week 7	Regula-Falsi method, Secant method, Newton-

	Raphson's method and Related Examples & Class test.
Week 8	Newton's iterative method for finding pth root of a number, Order of convergence of above methods .
Week 9	Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method, Related Examples and Assignment.
Week 10	Triangularization method (LU decomposition method). Crout's method and Related Examples. Class Test.
Week 11	Cholesky Decomposition method. Iterative method, Jacobi's method
Week 12	Gauss-Seidal's method, Relaxation method and Related Problems.
Week 13	Revision
Week 14	Revision and Class Test
Week 15	Doubt Class, Full syllabus test.

Lesson Plan for Session 2023-2024 (Jan 2024-April 2024)

Name- Dr Ravindra Yadav

Class- BSc III+ BA III (Even Semester)

Paper- Real & Complex Analysis

Week 1	Jacobians, Beta and Gamma functions
Week2	Beta and Gamma functions related Examples, Class Test, Double integrals.
Week 3	Triple integrals,Dirichlets integrals, change of order of integration in double integrals.
Week 4	Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Co-efficient. Class Test.
Week 5	Dirichlet's conditions, Parseval's identity for Fourier series
Week 6	Fourier series for even and odd functions & Related Examples .Class Test & Assignment.
Week 7	Fourier series for even and odd functions, Half range series, Change of Intervals, Assignment.
Week 8	Extended Complex Plane, Stereographic projection of complex numbers, continuity and differentiability of complex functions & Class Test
Week 9	Continuity and differentiability of complex functions,

	Analytic functions.
Week 10	Analytic functions related Examples , Cauchy-Riemann equations. Harmonic functions. Class Test.
Week 11	Analytic functions, Cauchy-Riemann equations. Harmonic functions. Class Test
Week 12	Mappings by elementary functions: Translation, rotation, Magnification and Inversion. Conformal Mappings. Class Test
Week 13	Mobius transformations. Fixed points, Cross ratio, Inverse Points and critical mappings. Assignment.
Week 14	Doubt Class and Revision.
Week 15	Revision , Class Test.