

Lesson Plan for Session 2021-2022 (1 April 2022- June 2022)

Name- Miss Seema (Mathematics)

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. 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. General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant, Class Test
Week 12	Method of auxiliary equations.

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Paper- Number Theory and Trigonometry

Week 1	Divisibility, G.C.D.(greatest common divisors), , L.C.M.(least common multiple)
Week 2	Primes, Fundamental Theorem of Arithmetic. Linear Congruences, Examples
Week 3	Linear Diophantine equations in two variables, Fermat's theorem. Wilson's theorem and its converse. Class Test
Week 4	Chinese Remainder Theorem, Complete residue system and reduced residue system modulo m . Euler's ϕ function Euler's generalization of Fermat's theorem.
Week 5	Quadratic residues. Legendre symbols. Lemma of Gauss; Gauss reciprocity law. Greatest integer function $[x]$. The number of (n) . Mobius σ divisors and the sum of divisors of a natural number n (The functions $d(n)$ and function and Assignment 1 .
Week 6	Mobius inversion formula. De Moivre's Theorem and its Applications
Week 7	De Moivre's Theorem Applications, Circular Functions of a Complex variables.
Week 8	Expansion of trigonometrical functions. Direct circular and hyperbolic functions and their properties. Class Test
Week 9	Logarithm of a complex quantity. Inverse circular and hyperbolic functions and their properties.
Week 10	Gregory's series. Summation of Trigonometry series.
Week 11	Summation of Trigonometry series. Assignment.
Week 12	Class Test & Revision

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Lesson Plan for Session 2021-2022 (1 April 2022- June 2022)

Name : Miss Seema (Mathematics)

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 differential equations and their solutions: Legendre functions and their properties-Recurrence Relations and generating functions. Orthogonality of Legendre polynomials. Rodrigues' Formula for Legendre Polynomials, Laplace Integral Representation of Legendre polynomial. Class Test
Week 5	Hermite differential equations and their solutions, Hermite functions and their properties-Recurrence Relations and generating functions. Orthogonality of Hermite polynomials. Rodrigues' Formula for Hermite Polynomials, Examples. Assignment 1.
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, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals, solution of ordinary differential equations using Laplace transform. Class Test.
Week 8	Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem, Related Examples, Assignment.
Week 9	Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms, Examples
Week 10	Solution of differential Equations using Fourier Transforms, Examples.
Week 11	Test & Revision
Week 12	Revision & Full Syllabus Test.

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

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Lesson Plan for Session 2021-2022 (1 April 2022- June 2022)

Name- Miss Seema (Mathematics)

Class- BSc III+ BA III (Even Semester)

Paper- Real & Complex Analysis

Week 1	Jacobians, Beta and Gamma functions
Week 2	Beta and Gamma functions related Examples, Class Test, Double integrals.
Week 3	Triple integrals, Dirichlet's 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, Fourier series for even and odd functions, Half range series, Change of Intervals. Assignment
Week 6	Extended Complex Plane, Stereographic projection of complex numbers, continuity and differentiability of complex functions. Class Test
Week 7	continuity and differentiability of complex functions, Analytic functions.
Week 8	Analytic functions related Examples, Cauchy-Riemann equations. Harmonic functions. Class Test.
Week 9	Analytic functions, Cauchy-Riemann equations. Harmonic functions. Class Test.
Week 10	Mappings by elementary functions: Translation, rotation, Magnification and Inversion. Conformal Mappings. Class Test
Week 11	Mobius transformations. Fixed points, Cross ratio, Inverse Points and critical mappings. Assignment.
Week 12	Revision, Class Test.

Lesson Plan for Session 2021-2022 (1 April 2022- June 2022)

Name: Miss Seema (Mathematics)

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

Paper: Linear Algebra

Week 1	Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space.
Week 2	Finitely generated vector space, Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces. Class Test 1.
Week 3	Invariance of the number of elements of bases sets, Dimensions. Class Test of Vector Space.
Week 4	Quotient space and its dimension & Theorems related to Quotient space & Assignment 1.
Week 5	Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces. Vector space of all the linear transformations.
Week 6	Dual Spaces, Bidual spaces, annihilator of subspaces of finite dimensional vector spaces. Class Test 2.
Week 7	Null Space, Range space of a linear transformation, Rank and Nullity Theorem. Algebra of Linear Transformation, Matrix of a linear Transformation, Change of basis.
Week 8	Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations, Eigen values and Eigen vectors of linear transformations. Assignment 2.
Week 9	Inner product spaces, Cauchy-Schwarz inequality, Orthogonal vectors, Orthogonal complements.
Week 10	Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces, Gram- Schmidt, Orthogonalization process. Class Test.
Week 11	Adjoint of a linear transformation and its properties, Unitary linear transformations.
Week 12	Class Test & Revision.

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