LESSON-PLAN (Session 2023-24)

ODD SEMESTER

Name of Teacher: **Dr. Manoj Kumar**
Designation: Assistant professor
Subject: Mathematics
Class: B.A./B.Sc.III Numerical Analysis

Subject/Paper: Sr. No.	**Months**	**Topics to be covered**	**Remarks if any,**
1	August-September	Finite difference 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.	Class Test
2	October	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.	Class Test Assignment-1
3	November	Numerical Differentiation: Derivative of a function using interpolation formulae as Studied in sections 1 & 11. Eigen Value problems: Power method, Jacobi's method, Given's method, House Holder's method QR- method, Lanczo's method.	Class Test Unit test Assignment-2
4	**D**ecember	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 method- 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	Class Test

LESSON-PLAN(Session2023-24) ODDSEMESTER

Name of Teacher: Dr. Manoj Kumar

Designation: Assistant Professor Subject: Real Analysis Class: B.A./ B.Sc-(N.M.&C.S.) 5th sem.

Subject/Paper: Sr.No.	**Months**	**Topics to be covered**	**Remarks if any,**
1	August	Riemann integral, Integrability of continuous and Monotonic functions.The fundamental theorem of integral calculus, Mean value theorems of integral calculus.	
2	September	Improper integral and their convergence, comparison tests,Abel's and Dirichlet's tests,Frullani's integral . Integral as a function of a parameter.	Unit test
3	October	Metric spaces,Open and closed sets in metric space, completeness in metric space	First Assignment
4	November	Continuity and uniform continuity in metric space, Compactness in metric spaces, connectedness in metric space.	Second Assignment

LESSON-PLAN(Session2023-24)ODD SEMESTER

Name of Teacher: Dr. Manoj Kumar

Designation : Assistant professor Subject:

Mathematics Class: Bsc/B.A. II STATICS

Subject/Paper: Sr.No.	**Months**	**Topics to be covered**	**Remarksifany,**
1	August	Composition and resolution of forces. Parallel forces. Moments and Couples	Assignment-I
2	September	Analytical conditions of equilibrium of coplanar forces. Friction. Centre of Gravity.	Test
3	October	Virtual work. Forces in three dimensions. Poinsots central axis.	Assignment-II
4	November l	Wrenches. Null lines and planes. Stable and unstable equilibrium.	Test

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2023-24

Name of the Teacher: Dr. Manoj Kumar *Department: Mathematics*

Subject/Course: Programming in C and numerical methods *Programme: B.A/B.Sc. Semester:*

4th

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1.	Programmer's model of a computer. Algorithms. Flow Charts. Data Types, Operators and expressions, Input/outputs functions.	JANUARY& FEBRUARY
2.	Decisions control structure :Decision statements, Logical and conditional statements, Implementation of Loops, Switch Statement and Case control structures. Functions, Proprocessors and Arrays, Strings: Character data type, Standard string handling functions	March
3.	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.	*April*
4.	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-Seidel's method, Relaxation method	*May*

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2023-24

Name of the Teacher: Dr. Manoj Kumar *Department:* Mathematics

Subject/Course: : Real and Complex Analysis
Programme: : B.Sc.3 rd & B.A.3rd

Semester: : 6 th

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1.	Jacobians , Beta and Gamma functions + 1st Assignment	January & February 2024
2.	Double and Triple integrals , Dirichlets integrals , Change of order of integration in double integrals. Fouriers series : Fourier expansion of piecewise monotonic functions , Properties of Fourier Coefficients , Dirichlets conditions, Parsevals identity for Fourier series , Fourier series for even and odd functions , Half range series , Change of intervals + Test	March 2024
3.	Extended Complex Plane , Stereographic projection of complex numbers , continuity and differentiability of complex functions , Analytic functions , Cauchy – Riemann equations. Harmonic functions.Mappings by elementary functions : Translation, Rotation,Magnification and Inversion, Conformal Mappings, Mobius Transformations. Fixed points , Cross ratio, Inverse Points + 2nd Assignment	April 2024
4.	Critical mappings + Revision	May 2024

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2023-24

Name of the Teacher: Dr. Manoj Kumar Department: Mathematics

Subject/Course: Special Functions & Integral Transforms Programme: B.A/ B. Sc.

Semester: 4th

Unit	Name of Topic/Contents	Tentative Dates/Days
1.	Power Series , Bessel's Equation and Function , Legendre's Equation + 1st Assignment	JANUARY& FEBRUARY
2.	Hermite's Equation , Laplace Transforms , Inverse Laplace Transforms + Test	March
3.	Use of Laplace Transforms in Integral Equations , Solution of Differential Equations by Laplace Transformation , Fourier Transforms + 2^{nd} Assignment	April
4.	Solution of Differential Equations by Fourier Transforms & Revision	May