LESSON PLAN

CLASS- B.C.A SEMESTER- 2ND

Name of extension lecturer: Surender Kumar

Subject/Paper - Mathematical foundation of computer science

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	JAN – 2024	Basic Statistics: Measure of Central Tendency, Preparing frequency distribution table, Mean, Mode, Median, Measure of Dispersion: Range, Variance and Standard Deviations, Correlation and Regression.
Unit-2	FEB – 2024	Algorithm: Algorithms, merits and demerits, Exponentiation, How to compute fast exponentiation. Linear Search, Binary Search, "Big Oh" notation, Worst case, Advantage of logarithmic algorithms over linear algorithms, complexity. Graph Theory: Graphs, Types of graphs, degree of vertex, sub graph, isomorphic and homeomorphic graphs, Adjacent and incidence matrices, Path Circuit ; Eulerian, Hamiltonian path circuit.
Unit-3	MARCH – 2024	Tree: Trees, Minimum distance trees, Minimum weight and Minimum distance spanning ,Trees Recursion: Recursively defined function.

		Merge sort, Insertion sort, Bubble sort, and Decimal to Binary.
Unit-4	APRIL 2024	Recurrence Relations: LHRR, LHRRWCCs, DCRR. Recursive procedures. Number Theory: Principle of Mathematical induction, GCD, Euclidean algorithm, Fibonacci numbers, congruences and equivalence relations, public key encryption schemes.

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LESSON PLAN

SEMESTER- 2ND

CLASS- M.Sc.

Name of extension lecturer : Surender Kumar

Subject/Paper - Integral equations and calculus of variations

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	JAN – 2024	Linear Integral equations, Some basic identities, Initial value problems reduced to Volterra integral equations, Methods of successive substitution and successive approximation to solve Volterra integral equations of second kind, Iterated kernels and Neumann series for Volterra equations. Resolvent kernel as a series. Laplace transform method for a difference kernel. Solution of a Volterra integral equation of the first kind.
Unit-2	FEB – 2024	Boundary value problems reduced to Fredholm integral equations, Methods of successive approximation and successive substitution to solve Fredholm equations of second kind, Iterated kernels and Neumann series for Fredholm equations. Resolvent kernel as a sum of series. Fredholm resolvent kernel as a ratio of two series. Fredholm equations with separable kernels. Approximation of a kernel by a separable kernel, Fredholm Alternative, Non homonogenous Fredholm equations with degenerate kernels.

Unit-3	MARCH-2024	Green function, Use of method of variation of parameters to construct the Green function for a nonhomogeneous linear second order boundary value problem, Basic four properties of the Green function, Alternate procedure for construction of the Green function by using its basic four properties. Reduction of a boundary value problem to a Fredholm integral equation with kernel as Green function, Hilbert-Schmidt theory for symmetric kernels.
Unit-4	APRIL- 2024	Motivating problems of calculus of variations, Shortest distance, Minimum surface of resolution, Brachistochrone problem, Isoperimetric problem, Geodesic. Fundamental lemma of calculus of variations, Euler equation for one dependant function and its generalization to 'n' dependant functions and to higher order derivatives. Conditional extremum under geometric constraints and under integral constraints.

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LESSON PLAN

CLASS- B.sc

SEMESTER- 4th

Name of extension lecturer: Surender Kumar

Subject/Paper - Programming in C and numerical methods

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	JAN-2024	Programmer's model of a computer, Algorithms, Flow charts, Data types, Operators and expressions, Input / outputs functions.
Unit-2	FEB-2024	Decisions control structure: Decision statements, Logical and conditional statements, Implementation of Loops, Switch Statement & Case control structures. Functions, Preprocessors and Arrays.
Unit-3	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.

Unit-4	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.

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LESSON PLAN

CLASS- B.Com

SEMESTER- 4th

Name of extension lecturer: Surender Kumar

Subject/Paper - Bussiiness stasttistics

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	JAN-2024	Index Numbers:- Meaning, Types and Uses; Methods of Constructing price and Quantity indices (Simple and Aggregate); Tests of adequacy; Chain-base Index numbers, Base shifting, Splicing and Deflating; Problems in constructing index numbers; Consumer price index.
Unit-2	FEB-2024	Unit- II Analysis of Time Series: - Causes of Variations in time series data; Components of a time series. Decomposition- Additive and Multiplicative models; determination of trend. Moving averages method and method of least squares (Including linear second degree, Parabolic and Exponential trend); Computation of seasonal indices by simple averages, Ratio to Trend, Ratio to moving average and link relative methods.

Unit-3	MARCH 2024	Theory of Probability: - Probability as a Concept; Approaches to defining probability, Addition and Multiplication laws of probability; Conditional probability, Baye's Theorem.
Unit-4	APRIL-2024	Probability Distribution : - Probability distribution as a concept; Binomial, Poisson and Normal Distribution- Their Properties and Parameters.

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