

LESSON PLAN OF COMPUTER DEPT.

Name Of College: Govt College for Girls Sector- 52, Gurugram,

Academic Session :2024-25

Semester: Even, (Feb 2025 to May 2025)

Name of Teacher: Ms Arti

Subject: Data Structure

Course-ID-240/BCA/CC201

Class: B.C.A

Course Outcomes:

CO1: Choose appropriate data structures and algorithms and use it to design solution for a specific problem.

CO2: Execute the operations of hashing to retrieve data from data structure.

CO3: Comprehend and select algorithm design approaches in a problem specific manner.

CO4: Design and analyze programming problem statements.

February 2025

Data Structure Definition, Data Type vs. Data Structure, Categories of Data Structures, Data Structure Operations, Applications of Data Structures. Algorithms Complexity and Time-Space Trade-off, Big-O Notation. Strings: Introduction, Strings. **Internal Class Test**

March 2025

String Operations, Pattern Matching Algorithms. Arrays: Introduction, Linear Arrays, Representation of Linear Array in Memory, Traversal, Insertions, Deletion in an Array, Multidimensional Arrays, Sparse Matrix Algorithm for Insertion, Deletion Addition and Multiplication in 2- D Array. Searching and Sorting Techniques, Sorting Techniques: Bubble Sort, Merge Sort, Selection Sort, Heap Sort, Insertion Sort. Searching Techniques: Sequential Searching, Binary Searching, Search Trees.

Assignment

April 2025

Stacks & Queues: Representation of Stacks, Stack Operations, Applications, Queues, Operations on Queues, Circular Queues, Dequeue, Priority Queues, Applications. Linked Lists: Introduction, Types, Operations (Insertion, Deletion, Traversal, Searching, Sorting), Applications, Dynamic Memory Management, Implementation of Linked Representations. Trees: Basic Terminology, Representation, Binary Trees, Tree Representations using Linked List, Basic Operation on Binary tree . **Class Test**

May 2025

Traversal of Binary Trees: In order, Pre-order & Post-order, Applications of Binary tree. Graphs: Definitions and Basic Terminologies, Representation of Graphs, Graph Traversals, Shortest Path Algorithm. **Internal Class Test and Revision.**

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Name Of College: Govt College for Girls Sector- 52, Gurugram,

Academic Session :2024-25

Semester: Even, (Feb 2025 to May 2025)

Name of Teacher: Ms Arti

Subject: Advance Spreadsheet Tools

Course-ID-240/CS/SE204

Class: B.C.A+BA(SEC)

COURSE OBJECTIVES:

- **Create and format spreadsheets**
- **Do the basic formatting of spreadsheet and apply formulas in a spreadsheet**
- **Create charts and protect worksheets**
- **Implement various spreadsheet tools practically.**

February 2025

Excel Features: Transferring Data to and From Non Worksheet Files, Understanding absolute, relative and mixed referencing in formulas, referencing cells in other worksheets and workbooks. Advanced Formulas: Text Function, Statistical Function, Math & Trig Functions, Date & Time and Logical Functions, Financial Functions.

Internal Class Test

March 2025

Excel Advance Features: Sorting Data, Use of Filters, Data Analysis with Goal Seek and Scenario Manager, Creating Scenario, Creating Pivot Tables, Using Slicers, Pivot Chart, Creating a Drop Down List, Locking Cells.

Assignment

April 2025

Excel Interactivity and Automation: Index and Match, Offset, Dynamic Charting, Database functions, Text functions, and Error functions: IfError, IsError, Aggregate, Circular Reference, Formula Auditing, Floating-Point Errors, Form Controls (Button, Combo, Check box, Spinner, List, Option), Recording Macros, Absolute and relative macros, editing macros.

Class Test

May 2025

Data Analysis and Decision-Making: Working with External Data, Advanced Uses of PivotTables, PowerPivot, Reporting with PowerPivot, Dashboard, Creating spreadsheet in the area of: Loan and Lease statement; Payroll Accounting; Graphical representation of data; Frequency distribution and its statistical parameters; Correlation and Regression Analysis. **Internal Class Test and Revision.**

LESSON PLAN OF COMPUTER DEPT.

Name Of College: Govt College for Girls Sector- 52, Gurugram,

Academic Session :2024-25

Semester: Even, (Feb 2025 to May 2025)

Name of Teacher: Ms Arti

Subject: Programming In C

Course-ID-240/CS/CC201

Class: B.SC (CS)

COURSE OBJECTIVE:

Master foundational programming structures, data types, control flow mechanisms, and advanced concepts such as arrays, strings, functions, structures, unions, pointers, and file handling for effective problem-solving in C programming.

February 2025

Programming Structure: Sequence, Selection, Iteration and Modular. Problem Solving techniques: Development Tools: Algorithm, Flowcharts and Pseudo code (Definition and its characteristics) Developing Algorithm and Drawing flowcharts.

Internal Class Test

March 2025

C Character set, Tokens, Identifier, Keywords, Variables, Data types, Qualifiers. Operators and Expressions: Arithmetic, Relational, Logical, Bit-Wise, Increment, Decrement, Conditional and Special operators. typedef, Type Conversion, Constants, Declaring Symbolic Constants, Character Strings, Enumerated Data Types, Operator Precedence and Associativity. Library functions. : Maths, string handling Functions. Control Structure: Compound Statement, Selection Statement: if, if-else, Nested if, switch. Iteration statement: for, while, do.. while , Nested loops, Jump statement: break, continue, goto. (Special emphasis on problem solving)

Assignment

April 2025

Arrays: Need, Types: Single and Two Dimensional Array. Strings: Strings Manipulation, Arrays of Strings, Evaluation order Function: Function Components, Return Data type, Parameter Passing, Return by Reference, Default Arguments, Recursive Functions, Arrays with Functions, Storage Classes.

Class Test

May 2025

Structure: Declaration, Definition, Accessing structure members, Initialization, Nesting of Structures. Union: Unions, Differences between Structure and Union Pointer: Introduction, Address Operator (&), Pointer variables, void pointers, Pointer Arithmetic, Pointers to Pointers. File handling : Hierarchy of File Stream Classes, Opening & closing a file, Testing for errors, File Modes, File pointers and their manipulations, Sequential Access, Random Access , Command Line arguments.

Internal Class Test and Revision.

LESSON PLAN OF COMPUTER DEPT.

Name Of College: Govt College for Girls Sector- 52, Gurugram,

Academic Session :2024-25

Semester: Even, (Feb 2025 to May 2025)

Name of Teacher: Dr. Namita

Subject: Mathematical Foundation of Computer Science

Course-ID-240/BCA/CC202

Class: B.C.A

Course Outcomes:

CO1: Gain proficiency in measures of central tendency and dispersion, correlation, and regression analysis, enabling effective data analysis and interpretation.

CO2: Understand fundamental algorithms such as exponentiation, linear search, and binary search, and grasp concepts in graph theory including types of graphs, adjacency matrices, and Eulerian and Hamiltonian paths.

CO3: Master concepts related to trees including minimum distance and spanning trees, and algorithms like merge sort, insertion sort, and bubble sort, enhancing problem-solving skills in algorithmic design.

CO4: Develop proficiency in solving recurrence relations and understanding their applications, and grasp foundational concepts in number theory including mathematical induction, GCD, Euclidean algorithm, and public key encryption schemes.

February 2025

Basic Statistics: Measure of Central Tendency, Preparing frequency distribution table, Mean, Mode, Median, Measure of Dispersion: Range, Variance and Standard Deviations, Correlation and Regression. **Class Test.**

March 2025

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 homoeomorphic graphs, Adjacent and incidence matrices, Path Circuit; Eulerian, Hamiltonian path circuit. **Assignment**

April 2025

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. **Class Test**

May 2025

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 **Class Test, Assignment**

LESSON PLAN OF COMPUTER DEPT.
Name Of College: Govt College for Girls Sector- 52, Gurugram, Academic Session :2024-25 Semester: Even, (Feb 2025 to May 2025) Name of Teacher: Dr. Namita Subject: Fundamentals of Web Technologies (MDC) Course-ID-240/CS/MD201 Class: B.A. Eco. Hons. IIndSEMESTER

February 2025

Introduction to Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching and WebCasting Techniques, Search Engines and Search Tools, Scripting Languages.

March 2025

Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Content Authoring, Web Graphics Design, Web Programming, Steps For Developing website, Choosing the Contents, Home Page, Domain Names, Creating a Website and Introduction to Mark-up Languages (HTML and DHTML).

April 2025

Web Development: HTML Document Features, Fundamentals HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text colour and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes.

May 2025

Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning and other useful Style Properties; Features of CSS3.

LESSON PLAN OF COMPUTER DEPT.	
Name Of College: Govt College for Girls Sector- 52, Gurugram, Academic Session :2024-25 Semester: Even, (Feb 2025 to May 2025) Name of Teacher: Ms Priyanka Balhara Subject: Database Management System Course-ID-240/BCA/CC203 Class: B.C.A	
Course Outcomes: CO1: Express the basic concepts of DBMS and RDBMS. CO2: Apply normalization theory to the normalization of a database CO3: Apply the concept of Transaction Management & Recovery techniques in RDBMS. CO4: Analyze various concurrency control and recovery techniques.	
February 2025	Database System Concepts and Architecture: Traditional File Processing System vs DBMS, Characteristics & Advantages of DBMS, Three-Schema Architecture and Data Independence; Data Models, Schemas, and Instances; Database Languages and Interfaces; Classification of DBMS. Overview of Entity-Relationship Diagram, Relational Model - Constraints, Relational Database Schemas, Relational Algebra and Relational Calculus; Codd Rules.
March 2025	Normalization for Relational Databases: Functional Dependencies and Normalization; SQL: SQL as 4GL, SQL Components: DDL, DML, DQL, DCL, TCL; Data Definition and Data Types; Constraints, Queries, Insert, Delete, and Update Statements; Views, Stored Procedures and Functions; Database Triggers, SQL Injection. Query Processing and Optimization: Translating SQL queries into Relational Algebra, Basic Algorithm for Executing Query Operations, Using Heuristic in Query Optimization, Using Selectivity and Cost Estimation in Query Optimization, Semantic Query Optimization. Assignment 1
April 2025	Transaction Processing: Introduction, Desirable properties of Transactions, Schedules & Recoverability, Serialization of Schedulers, Transaction Support in SQL. Basics of Database Security and Authorization. Concurrency Control Techniques: Locking techniques for Concurrency Control, Concurrency Control based on Timestamp ordering, Multiversion Concurrency Control Techniques, Validation Currency Control Techniques, Granularity of data items and multiple granularity locking, Using locks for Concurrency Control in Indexes. Test

May 2025	Database Recovery Techniques: Basic Concepts Basics of Database Security and Authorization. Assignment 2
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LESSON PLAN OF COMPUTER DEPT.
Name Of College: Govt College for Girls Sector- 52, Gurugram, Academic Session :2024-25 Semester: Even, (Feb 2025 to May 2025) Name of Teacher: Ms Priyanka Balhara Subject: Introduction to Data Science Course-ID-240/CS/MI201 Class: B.C.A

COURSE OBJECTIVES:**CO1:** To explore data types, Python fundamentals, special data formats**CO2:** Advanced data manipulation using NumPy, Pandas**CO3:** Data visualization tools for effective data analysis and presentation.**Februray 2025**

Data Types: Understanding data - Types of data - Data Evaluation - Data Sources - Preparing and Gathering data - Digital Data - Introduction to Big Data - Sources of Big Data - Characteristics of Big Data

March 2025

Python fundamentals: Python program execution environment - Statements - Expressions - Flow of Control statements - Functions - Scope of Variables. Special Data Formats - List - List Methods - Tuples - Tuple Methods - Arrays - Dictionaries - - Sets - Related Methods - String - String Processing Methods.

Assignment 1**Test****April**

Numpy and Pandas - Features of Numpy - Mathematical functions - Statistical functions - nd-Arrays - Features of Pandas - series data structure - data frames - creation and manipulation of data frames, Data Visualization - Matplotlib package - plotting graphs - legends - colors - labels - seabom - package -plotly and dash packages

May 2025**Revision**