

LESSON PLAN

CLASS: - B.C.A 2nd Yr

SEMESTER:- 3rd Sem

Name of Teacher - Saurabh Jain

Subject/Paper: - Database Management System

S.No.	Week Days	Syllabus
Unit-1	11/08/2026 -16/08/2026	Introduction to Databases: Definition of Data, Database, and DBMS, Overview of Database Applications, Advantages and Disadvantages of DBMS, Roles of Database Users and Administrators Data Models: Introduction to Data Models, Types of Data Models (Hierarchical, Network, Relational, Object-oriented), Importance of Data Models in DBMS
	17/08/2026 – 31/08/2026	Database Design: Keys: Primary Key, Candidate Key, Super Key, Foreign Key, Composite Key, Alternate Key, Unique Key, Surrogate Key, Constraints in a table: Primary Key, Foreign Key, Unique Key, NOT NULL, CHECK, Entity-Relationship (ER) Model, Entities and Entity Sets, Attributes and Relationships, ER Diagrams, Key Constraints and Weak Entity Sets, Extended ER Features, Introduction to the Relational Model and Relational Schema
Unit-2	01/09/2026 – 15/09/2026	Relational Algebra and Calculus: Introduction to Relational Algebra, Operations: Selection, Projection, Set Operations, Join Operations, Division, Tuple and Domain Relational Calculus Structured Query Language (SQL): SQL Basics: DDL and DML, Aggregate Functions (Min(), Max(), Sum(), Avg(), Count()), Logical operators (AND, OR, NOT), Predicates (Like, Between, Alias, Distinct), Clauses (Group By, Having, Order by, top/limit), Inner Join, Natural Join, Full Outer Join, Left Outer Join, Right outer Join, Equi Join
	16/09/2026 – 30/09/2026	Advanced SQL: Analytical queries, Hierarchical queries, Recursive queries, Views, Cursors, Stored Procedures and Functions, Packages, Triggers, Dynamic SQL SQL Normalization and Database Design: Functional Dependencies: Armstrong's Axioms, Definition, Properties (Reflexivity, Augmentation, Transitivity), Types (Trivial, Non-Trivial, Partial and Full Functional Dependency), Closure of Functional Dependencies, Normal Forms

		(1NF, 2NF, 3NF, BCNF), Denormalization.
Unit-3	01/10/2026- 15/10/2026	Transaction Management: ACID Properties, Transactions and Schedules, Concurrent Execution of Transactions, Lock-Based Concurrency Control, Performance of Locking, Transaction Support in SQL, Introduction to Crash Recovery, 2PL, Serializability, and Recoverability, Introduction to Lock Management, Dealing with Deadlocks
	16/10/2026 – 31/10/2026	Database Storage and Indexing: Data on External Storage, File Organizations and Indexing, Index Data Structures, Comparison of File Organizations, Indexes and Performance Tuning, Guidelines for Index Selection, Basic Examples of Index Selection
Unit-4	1/11/2026 – 15/11/2026	NoSQL Databases and Big Data: Introduction to NoSQL, Data Models: Document, Key value, Column family, Graph. Uses and Features of NO/SQL document databases. CAP theorem, BASE vs ACID, CRUD operations, MongoDB operators, Overview of Big Data Technologies: Hadoop, MongoDB, Cassandra.
	15/11/2026 – 05/12/2026	Database Security and Advanced Topics: Introduction to Database Security, Access Control, Discretionary Access Control, Introduction to Data Warehousing, OLAP, Data Mining

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SEMESTER:- 3rd Sem

Name of Teacher - Saurabh Jain

Subject/Paper: - Python Programming

S No.	Week Days	Syllabus
Unit-1	11/08/2026 -16/08/2026	Introduction: History and Application areas of Python. Structure of Python Program; Identifiers and Keywords; Operators and Precedence; Basic Data Types and type conversion;
	17/08/2026 – 31/08/2026	Strings: Creating and Storing Strings, Built-in functions for strings; string operators, String slicing and joining; Formatting Strings.
Unit-2	01/09/2026 – 15/09/2026	Control Flow Statements: Conditional Flow statements; Loop Control Statements; Nested control Flow; continue and break statements, continue, Pass and exit.
	16/09/2026 – 30/09/2026	Functions: Built-In Functions, Function Definition and call; Scope and Lifetime of Variables, Default Parameters, Command Line Arguments; Lambda Functions; Assert statement; Importing User defined module;
Unit-3	01/10/2026- 15/10/2026	Mutable and Immutable objects: Lists, Tuples and Dictionaries; Commonly used Functions on Lists, Tuples and Dictionaries. Passing Lists, tuples and Dictionaries as arguments to functions. Using Math and Numpy module for list of integers and arrays.
	16/10/2026 – 31/10/2026	Files: Types of Files; Creating, Reading and writing on Text and Binary Files; The Pickle Module, Reading and Writing CSV Files. Reading and writing of csv and JSON files.
Unit-4	1/11/2026 – 15/11/2026	Exception Handling: Try-except-else-finally block, raise statement, hierarchy of exceptions, adding exceptions.
	15/11/2026 – 05/12/2026	Data visualization: Plotting various 2D and 3D graphics; Histogram; Pi charts; Sine and cosine curves.


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CLASS: - B.C.A 2nd Yr

SEMESTER:- 3rd Sem

Name of Teacher - Saurabh Jain

Subject/Paper: - Software Engineering

S.No.	Week Days	Syllabus
Unit-1	11/08/2026 -16/08/2026	The evolving role of software, changing nature of software, layered technology, a process framework, Process models: The waterfall model, incremental process models, evolutionary process models, the unified process.
	17/08/2026 – 31/08/2026	Agile software development: Agility Principles, Agile methods, Plan-driven and agile development, Extreme programming, Scrum, A Tool Set for the Agile Process.
Unit-2	01/09/2026 – 15/09/2026	Software Requirements Engineering: Functional and non-functional requirements, the software requirements document, Requirements specification, Requirements engineering processes, Requirements elicitation and analysis, Requirements validation, Requirements management.
	16/09/2026 – 30/09/2026	Risk management: Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan. Project planning: Software pricing, Plan-driven development, Project scheduling, Agile planning, Estimation techniques.
Unit-3	01/10/2026- 15/10/2026	Design: Design process and design quality, design concepts, the design model, software architecture, data design, architectural design, Basic structural modeling, class diagrams, sequence diagrams, collaboration diagrams, use case diagrams, component diagrams. Testing Strategies: A strategic approach to software testing, test strategies for conventional software, black-box and white-box testing, validation testing, system testing, the art of debugging.
	16/10/2026 – 31/10/2026	Product metrics: Software quality, metrics for analysis model, metrics for design model, metrics for source code, metrics for testing, metrics for maintenance.

Unit-4	1/11/2026 – 15/11/2026	Quality Management: Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability.
	15/11/2026 – 05/12/2026	Release Management: Release planning, development and build plans, release strategies, risk management, and post-deployment monitoring. Product sustenance: Maintenance, updates, End of life, migration strategies.


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