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Database Management System — Complete Syllabus

BTEUP Diploma in Information Technology • 3rd Semester • Session 2026–27
Subject 3.2 (Theory) • Total 100 Marks • 3 Credits • L 3 – P 0

About this document: Database Management System is subject 3.2 of the 3rd semester of the Diploma in Information Technology. This document gives the complete unit-wise syllabus, the examination scheme, the course outcomes and the reference books from the official curriculum.

Examination Scheme

Code	Paper	Type	L – P	Credits	Internal	External	Total
3.2	Database Management System	Theory	3 – 0	3	Theory 40	Theory 60 (3 hrs)	100
Database Management System Total				**3**	**40**	**60**	**100**

What This Subject Aims To Do

It covers the development of database-driven applications using the capabilities provided by modern database management system software. The concepts include conceptual modeling, relational database design and database query languages.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks (%)

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1	Introduction	6	10
2	Data Model and Keys	8	25
3	Relational Model	10	25
4	Relational Database Design	10	25
5	SQL/MySQL	8	15

Total: 42 periods, 100%. The percentages are the suggested distribution of marks in the official syllabus, out of the 60-mark external theory paper. Units 2, 3 and 4 together carry three quarters of the paper.

Unit 1 — Introduction (6 Periods, 10%)

Topics: Database system concepts and architecture, components of DBMS, table structure, schema definition, three views of data (external view, conceptual view, internal view).

In simple words: What a database system is and how it is put together — its components, what a schema is, and the three views of data: what the user sees, what the designer defines, and how it is stored.

Unit 2 — Data Model and Keys (8 Periods, 25%)

Topics: Define data model; data models: network model, hierarchical model, E-R model; advantages and disadvantages of each data model; concept of keys (primary, candidate, super, foreign); constraints; strong entity set and weak entity set.

In simple words: How data is modelled before any table is made — the three data models, the E-R model with entities and relationships, and keys: the columns that identify each row.

Unit 3 — Relational Model (10 Periods, 25%)

Topics: The relational data model and relational database constraints; ER/EER to relational model mapping; relational algebra and relational calculus; relational algebra (basic operations: union, intersection, difference and Cartesian product); additional relational algebraic operations (projection, selection of rows, division, rename and join).

In simple words: The relational model itself — how an E-R diagram becomes tables, the constraints that keep tables honest, and relational algebra: the operations (select, project, join and the rest) that SQL is built on.

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Unit 4 — Relational Database Design (10 Periods, 25%)

Topics: Functional dependencies and normalization for relational databases; types of normalization (1NF, 2NF, 3NF, multivalued dependencies and BCNF, Fourth Normal Form, Fifth Normal Form).

In simple words: How to design tables that do not repeat data or contradict themselves — functional dependencies and normalization, from 1NF up to 5NF, with BCNF in between.

Unit 5 — SQL/MySQL (8 Periods, 15%)

Topics: MySQL data types; data definition commands; data manipulation commands; data retrieval commands; types of operators — arithmetic, comparison and logical operators.

In simple words: The working language: SQL in MySQL — creating tables, inserting, updating and deleting rows, retrieving data with SELECT, and the operators that filter it.

Course Outcomes

- CO1: Describe fundamentals of DBMS, its installation and working.
- CO2: Understand the concept of keys and various data model.
- CO3: Understand relational model and relational algebraic operations.
- CO4: Designing a Relational Database.
- CO5: Apply SQL commands to create, insert, retrieve, update, delete data from the Relational databases.

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Source: BTEUP IRDT Kanpur NEP-2020 curriculum for Diploma in Information Technology, effective session 2026-27 (urise.up.gov.in). Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.