Vikram University, Ujjain

Board of studies in Computer science (Faculty of Engineering Science)

Syllabus of

Diploma in Database Technologies

Exclusively for University Teaching Department (ICS, VUU)

Diploma in Database Technologies of UTD (ICS, VUU)

(Effective from Academic Session 2021-22)

[Modified as according to the provision of "Regulation No. 15"]

COURSE STRUCTURE

Diploma in Database Technologies

S.No.	Course code	Title of Paper	Theory External Marks	Min. Pass Marks	Internal Mark	Min. Pass Marks	Max Marks
1	DBT-101	DATABASE MANAGEMENT SYSTEM	75	27	25	9	100
2	DBT-102	RDBMS USING MYSQL	75	27	25	9	100
3	DBT-103	Internship/ Industrial Training/ Project Work	150 …… 300 ……..	54 …… ……	50 …… 100 ……	28 …… ……..	200 …… 400 ……

Minimum pass marks in each Paper (Theory) - 36%
Minimum pass marks in each Paper (Internal Assessment) - 36%
Minimum pass marks in Practical (Theory) - 36%

Diploma in Database Technologies

Objective Of Course

Diploma in Database Technologies (DBT) is a unique six months programme offered by Institute of Computer Science, Vikram University, Ujjain is an excellent blend of knowledge and practice in the field of Database and its industrial applications. The program is targeted for creating qualified Database Professionals. A database administrator (DBA) is the information technician responsible for directing or performing all activities related to maintaining a successful database environment. A DBT makes sure an organization's database and its related applications operate functionally and efficiently.

Outcome of the Course:

On completion of the course the participants will learn the concept of Database Administration using open-source statistical tools like Oracle, SQ L and some other tools and techniques. The participants will be able to implement industry-oriented Database Project.

DBT-101 DATABASE MANAGEMENT SYSTEM

UNIT 1

Introduction to Databases, Transactions, and Data Models:
What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management.
Data Models
The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.

UNIT 2

Database Design, ER-Diagram and Unified Modelling Language
Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, weak entity sets, Codd's rules, Relational Schemas, Introduction to UML **Relational database model:** Logical view of data, keys, integrity rules. **Relational Database design:** features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF).

UNIT 3

Relational Algebra and Calculus:
Relational algebra: introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison.
Calculus: Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities.

UNIT 4

Constraints, Views and SQL
What are constraints, types of constrains, Integrity constraints, **Views:** Introduction to views, data independence, security, updates on views, comparison between tables and views **SQL:** data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers.

UNIT 5

Transaction management and Concurrency control
Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management.

Text Books:

- A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", fifth Edition McGraw-Hill ,
- Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning.

DBT-102 RDBMS USING MYSQL

Unit-I

Relational Database Design: pitfalls in relational database design, decomposition, normalization using functional dependency, normalization using multi-value dependency, normalization using joined dependency, Integrity Constraints: Domain Constraints, Entity Integrity Constraints, Referential Integrity Constraints, CODD's 12 rule.

Unit-II

Brief History and overview of Sql, Sql Basic: Creating a Database, Adding Tables, Adding Records, Removing and Modifying records, executing queries, Data types: Numeric, String, Date & Time, Operators: Arithmetic, Comparison, Logical, Functions: Math Function, Aggregate, String, Date & Time.

Unit-III

Key Concept: Primary key and Foreign Key, Candidate Key. Working with data: Inserting record, Updating & Deleting Records, retrieving specific rows and columns, built in function, aliasing table and column name sorting, query results, grouping query results.

Unit-IV

Joins: Overview of Join, types of join: Cross, Inner, Outer, Self, Union, subqueries, overview of subqueries, types of sub- query: Where/Having Clause, subqueries and from clause, Subqueries and Joins.

Unit-V

Security, Access Control and Privilege: Granting, Revoking & Viewing user privileges, commit and roll back. Transaction, Acid Properties of Transaction.

Text Book:

1. Complete Reference using MySql by Vikram Vaswani.
2. An Introduction to DataBase System by Bipin.C. Desai.