

Devi Ahilya University, Indore, India Institute of Engineering & Technology				MSc – I Year (Applied Mathematics) with Specialization in Computing & Informatics Semester- III			
Subject Code & Name	Instructions Hours per Week			Credits			
AM3PC2: Database Theory	L	T	P	L	T	P	Total
	3	1	-	3	1	-	4
Duration of Theory Paper: 3 Hours							

Objectives: The course aims to familiarize the students with Database Management System and to develop skill for developing and managing database applications.

Prerequisite(s):NIL.

COURSE OF CONTENTS

UNIT-I

Database Environment: Basic concepts, Comparison with Traditional file processing system, Merits & demerits of database approaches, Ranges of Database applications; Components of Database Environment;

Database Development Process: Systems development process, Three-Schema Architecture for Database Development.

UNIT-II

Database Analysis: Business Rules; E-R Model Construct; Cardinality Constraints; Enhanced E-R Model & business Rules, Modeling Enhanced relationship – Specialization & Generalization, specifying constraints in Supertype/Subtype Relationship, Entity Clustering; Case Studies.

UNIT-III

Database Design: Relational Data Model – Codd's Rules, Integrity Constraints; Transforming EER Diagram into Relations; Functional Dependencies. Normalization and Denormalization.

Physical Database Design: File Organization, Physical Database Design Process, Index - Primary Key Index; Secondary Key Index; When to use Index; Improving file access performance; RAID Levels;

UNIT-IV

SQL: DDL, DML, DCL commands; processing single Table, Processing Multiple Table, Join operations;

Advanced SQL: PL/SQL Constructs – View, Triggers, Cursor, Exception Handling and Routines; Embedded SQL and Dynamic SQL, Transaction Processing – Properties, Schedules & Serializability Issues.

UNIT-V

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.

BOOKS RECOMMENDED:

[1] J. Hoffer, M. Prescott, and F McFadden, Modern Database Management, 6/e, Pearson Education, 2006.

[2] S. B. Navathe, R. Elmasri, S.K.Gupta, D.V.L.N. Somayajulu, Fundamentals of Database System, 4/e, Pearson Education, 2004.

- [3] A. Silberschatz, H. Korth, and S. Sudarshan, Database System Concepts, 5/e, McGraw-Hill, 2005.
- [4] C.J. Date, An Introduction to Database Systems, 7/e, Pearson Education, 2006.