

Programme:	Course Title:	Course Code:							
B. Tech. (CSE)	Information and D	Information and Database Management Systems							
Type of Course:	Prerequisites:	Prerequisites:							
Program Core	Data Structures	40							
Year/Semester:	Lecture	Tutorial Hrs/Week:	Practical Hrs/Week:	Credits:					
2/Odd	Hrs/Week: 3	0	2	4					

Learning Objective:

The course is primarily concerned with the capture, digitization, representation, organization, transformation, and presentation of information; algorithms for efficient and effective access and updating of stored information; data modeling and abstraction; and physical file storage techniques.

Course outcomes (COs):

On com	Bloom's Level	
CO-1	Understand the different issues involved in the design and implementation of	2
	a database system	
CO-2	Apply the modeling concepts and notation of the relational data model	3
CO-3	Determine database storage structures and access techniques for a given	3
	problem.	
CO-4	Understand the basic working of database management aspects in terms of	2
	transaction processing, concurrency control, and recovery.	

Course Topics	Lecture	Hours
UNIT – I (Information Management Concepts)	3	
1.1 Information systems as socio technical systems, basic information storage and retrieval concepts, Information capture and representation	1	3
1.2 Supporting human needs: searching, retrieving, linking, browsing, and navigating. Information management applications	1	
1.3 Declarative and navigational queries, use of links, Analysis and indexing, Quality issues: reliability, scalability, efficiency, and effectiveness	1	
UNIT – II (Introduction to DBMS)	3	2
1.1 File system vs DBMS	1	3



1.2 Approaches to and evolution of database systems, Components of database systems, Design of core DBMS functions (e.g., query mechanisms, transaction management, buffer management, access methods), 1.3 Database architecture and data independence, Use of a declarative query language Lab (Data management using file system) 2 UNIT – III (Data Modeling) 1.1 Data modeling, Conceptual models (entity-relationship diagrams) 2 1.2 Relational data models 1.3 Semi-structured data model (expressed using DTD or XML Schema) 1 1 UNIT-IV (Relational Databases) 1.1 Mapping conceptual schema to a relational schema, Entity and referential integrity 1.2 Relational algebra and relational calculus, Relational Database design 1.3 Functional dependency, Decomposition of a schema; lossiess-join and dependency-preservation properties of a decomposition, Candidate keys, superkeys, and closure of a set of attributes 1.4 Normal forms (3NF, BCNF) 1.5 Lab (SQL - DDL) 2 UNIT-V (Query Languages) 1.1 Overview of database languages, SQL (data definition, query formulation, update sublanguage, constraints, integrity) 1.2 Selections, Projections, Select-project-join, Aggregates and group-by 1.3 Subqueries, stored procedures, triggers 1.4 Topology Control 1.5 Data-centric and content-based networking 1.6 Security 1.1 Secondary storage devices; File records; Unordered file, ordered file 1.2 Hashed file; Indexes; Dense and Sparse index; Single-level and Multi-level indexes; 1.3 Multi-level indexing using B+ tree 2 Lab (Indexes)			
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1.3 Multi-level indexing using B+ tree 2		2	
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	Lab (Indexes)		3



UNIT-VII (Transaction Processing, Concurrency Control, and Recovery)	12	
1.1 Transaction and system concepts; ACID properties;	1	9
1.2 Serializability; Concurrency control techniques – Two phase locking, Deadlock and starvation;	5	
1.3 Recovery concepts; Immediate update, Deferred update; Write-ahead logging; Checkpointing;	6	
Lab (Triggers)		4
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UNIT-VIII (Advanced Topics)	2	
1.1 Introduction to distributed, and object-oriented databases;	1	2
1.2 Basic concepts of data warehouse; Approaches for managing large volume of data (noSQL database systems)	1	
Lab (Views)		3

Textbook References:

Text Book:

• R. Elmasri and S. Navathe, *Fundamentals of Database Systems*, Addison-Wesley, 6th ed., 2011

Reference books:

- Silberschatz, H. Korth, and S. Sudarshan, *Database System Concepts*, McGraw-Hill.
- R. Ramakrishnan, *Database Management Systems*, WCB/McGraw-Hill.
- C.J. Date, An Introduction to *Database Systems*, Pearson, 8th ed.

Additional Resources (NPTEL, MIT Video Lectures, Web resources etc.):

- http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-830-databasesystems-fall-2010/
- http://nptel.ac.in/courses/106106093/
- http://nptel.ac.in/courses/106106095/
- http://www.nptelvideos.in/2012/11/database-management-system.html

Evaluation Method						
Item	Weightage (%)					
Lab Evaluation 1	5					
Lab Evaluation 2	5					
Lab Quiz	5					
Lab Project	10					
Quiz 1	5					



Quiz 2	5
Quiz 3	5
Assignment	10
Midterm	20
Endterm	30

CO and PO Correlation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1						2	1		3	3	1	
CO2	3	3	2						2	1		3	3	1	
CO3	3	3	1						2	1		3	3	1	
CO4	3	2	1						2	1		3	3	1	

Last Updated On: 17th May 2021

Updated By: Rajbir

Approved By: