

University of Mumbai			
Class: S.E.	Branch: Computer Engineering	Semester: IV	
Subject : Database Management Systems(Abbreviated as DBMS)			
Periods per Week (each 60 min.)	Lecture	04	
	Practical	02	
	Tutorial	--	
		Hours	Marks
Evaluation System	Theory	03	100
	Practical & Oral	02	25
	Oral	---	---
	Term Work	---	25
	Total	05	150

Module	Contents	Hours
1	Introduction To Database Concepts: <ul style="list-style-type: none"> • Introduction to data processing, Overview of file systems • Drawbacks Of File System, Concept of a Database • Comparison of Database Systems and file Systems • Data Abstraction, 3-layered Architecture and data Independence. • Data Models, Database Languages. • Database users and administrators • Database system architecture 	04
2	Entity Relationship Model: <ul style="list-style-type: none"> • Basic Concepts • Constraints • Design issues, Entity Relationship Diagrams • Strong-Weak entity sets • Extended ER features • Mapping an ER schema to tables 	05
3	Relational Model : <ul style="list-style-type: none"> • Concept of a Relation • Notion of primary and secondary keys • Structure relation database • The relation algebra and extended algebra operation • Formation of queries, modification of database , views 	05

4	SQL : <ul style="list-style-type: none"> • Background, Basic structure • Set operation, Aggregate function, NULL values • Nested queries, Views , Complex Queries, Database modifications • DDL, Embedded SQL, Stored procedures and functions 	05
5	Integrity and Security : <ul style="list-style-type: none"> • Domain Constraints, Referential Integrity • Assertion, Triggers • Security and Authorization , Authorization in SQL 	04
6	Relational-Database Design : <ul style="list-style-type: none"> • First Normal Form, Pitfalls in Relational-Database designs • Function Dependencies, Armstrong Axioms • 2nd , 3rd , BCNF and 4th normal form • Decomposition, desirable properties of decomposition • Overall database design process 	05
7	File Structure, Indexing and Hashing: <ul style="list-style-type: none"> • File Organization , Organization of records in files , Data dictionary storage • Basic Indexing Concepts, Ordered Indices, B+ Trees and B tree Index Files • Static hashing, Dynamic hashing • Index Definition in SQL, multiple key access 	05
8	Transaction : <ul style="list-style-type: none"> • Transaction Concepts, Transaction states • Implementation of atomicity and Durability • Concurrent executions, Serializability, Recoverability • Implementation of Isolation, Transaction Definition in SQL 	05
9	Concurrency Control : <ul style="list-style-type: none"> • Lock-Based protocols • Timestamp-based protocols • Validation-based protocols • Deadlock handling 	05
10	Recovery System : <ul style="list-style-type: none"> • Failure Classification, Storage structure • Recovery and Atomicity • Log based recovery , Shadow paging • Recovery with concurrent transaction 	05

	<ul style="list-style-type: none">• Buffer Management	
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TERM WORK:

1. At least 12 experiments in SQL and PL-SQL with a weightage of 10 marks
2. A term work test must be conducted with a weightage of 10 marks
3. Attendance 5 marks

TEXT BOOKS:

1. Korth, Silberchatz, Sudarshan : “Database Systems Concept”, 5th Edition , McGraw Hill
2. Peter Rob and Carlos Coronel,”Database Systems Design, Implementation and Management”, Thompson Learning, 5th Edition

REFERENCE BOOKS:

1. Elmasri and Navathe,”Fundamentals of database Systems”, 4th Edition, PEARSON Education.
2. C.J.Date, A. Kannan, “Introduction to Database Systems”, 8th Edition, Addison Wesley.
3. Mark.L.Gillenson, PaulRaj Ponniah,”Inroduction to Database Management”, Wiley
4. Raghu, Ramkrishnan and Johannes Gehrke,” Database management Systems”, TMH
5. Dr. P.S. Deshpande, SQL and PL/SQL for Oracle 10g.Black book, Dreamtech Press