



Department of Computer Applications

National Institute of Technology, Jamshedpur

(An Institution of national importance under MHRD, Govt. of India)

Autumn Semester Session 2020 – 2021

Date: 25/08/2020

Course Handout

Batch	:	Master of Computer Application (3rd Semester)
Course No.	:	CA3301
Course Title	:	Database Management Systems
Instructor In-Charge	:	Prof. Danish Ali Khan
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Course Description:

As organizations strive to excel in a modern competitive environment, managing information acquires greater relevance. Database system now plays a vital role in the effective management of information. Database being an ingredient of modern computing system, the subject database management systems is compulsory for students enrolled in various computer science courses in most universities. The book Database management System aims to provide an in-depth knowledge of most important aspects of database systems in easy-to-understand question-and-answer format.

DBMS Course Comprises questions and their corresponding answers on fundamental concepts like database design, languages and implementation as well as advanced concepts like distributed databases and query processing and optimization.

Database Management Systems:

Scope

- To provide a good fundamental concept about various role of Database Management System..
- To develop excellent understanding about Query processing and optimization..
- To make Excellent Programming Skill as well as Database Design.

Objectives

This course is designed to provide students a comprehensive introduction DBMS leading to the ability to understand contemporary terminology, progress, issues, and trends. The course provides students with an understanding of the algorithms and theories that form the basis of Database modeling.

Text Books:

1. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
2. Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication.
3. Date C J, "An Introduction To Database System", Addison Wesley

Reference Books:

- 1 Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley
- 2 Paul Beynon Davies, "Database Systems", Palgrave Macmillan
- 3 Majumdar & Bhattacharya, "Database Management System", TMH
- 4 Ramakrishnan, Gehrke, "Database Management System", McGraw Hill
- 5 Bharti P.K, "An introduction to Database Systems", JPNP

Course Plan

Lecture No.	Learning Objectives	Topics to be covered	Refer to chapter see (text book)
1-6	Introduction: An overview of database management system, Database System Vs File System, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure.	Introduction	T1, R1,R2,R5

7-14	ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.	Data Modeling using the Entity Relationship Model:	T1,R1,R2
15-21	Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus.	Relational data Model and Language:	T2,R2,R3
22-28	Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes, Queries and sub queries, Aggregate functions, Insert, update and delete operations, Joins, Unions, Intersection, Minus, Cursors in SQL, Triggers.	Introduction to SQL:	T1,T2
29-35	Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependencies, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.	Data Base Design & Normalization :	T1, T2, R3
36-44	Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.	Transaction Processing Concepts:	T1, T2 ,R3
45-52	Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi-version schemes, Recovery with concurrent transaction. Transaction Processing in Distributed system, data fragmentation. Replication and allocation techniques for distributed system, overview of concurrency control and recovery in distrusted database.	Concurrency Control Techniques:	T1,T2,R1

Evaluation Scheme (EC)

EC No.	Evaluation Component	Duration	Weightage	Date & Time	Nature of Component
1.	Mid Term Examination	02 Hours	30%		
2.	End Term Examination	03 Hours	50%		
3.	Internal Assessment*	--	20%	--	(Class Test, Attendance, Assignments/Reports/Projects/Seminars)
*Class Test/Reports/Projects/Seminars - 10 Marks, Assignment- 05 Marks, Attendance & Punctuality in class- 05 Marks					

- **Chamber consultation hour:** Monday to Friday, 5PM to 6PM, Faculty Chamber
- **Notices:** All notices regarding the course will be displayed only on the Department of Computer Applications notice board

Instructor In-Charge
CA3301