

IT260: DATABASE MANAGEMENT SYSTEM

Credit and Hours:

Teaching Scheme	Theory	Practical	Tutorial	Total	Credit
Hours/week	3	2	0	5	5
Marks	100	50	0	150	

A. Outline of the Course:

Sr. No.	Title of the unit	Minimum number of hours
1.	Introductory concepts of DBMS	05
2.	Formal Relational Model and Query Languages	05
3.	Relational Database Design	10
4.	Transaction Management	10
5.	Concurrency Control and Recovery System	10
6.	Indexing	05
	Total hours (Theory):	45
	Total hours (Lab):	30
	Total hours:	75

B. Detailed Syllabus:

1.	Introductory concepts of DBMS	05 Hours	10%
	Introduction and application of DBMS, Data Independence, Database System Architecture – levels, Mapping, Database users and DBA, Entity-Relationship model, constraints, keys, Design issues, E-R Diagram, Extended E-R features- Generalization, Specialization, Aggregation, Translating E-R model into Relational model.		
2.	Formal Relational Model and Query Languages	05 Hours	12%
	The relational Model, Structure of Relational Databases, Database Schema, Keys, Relational Algebra, Fundamental Relational Algebra operations, SQL fundamentals, DDL, DML, DCL Concepts, Cursors, Stored Procedures, Stored Functions, Database Integrity – Triggers.		
3.	Relational Database design	10 Hours	22%
	Functional Dependency–definition, Trivial and Non-Trivial FD, Closure of FD set, Closure of attributes, canonical cover, First, Second and Third Normal Forms, Dependency Preservation, Boyce/Codd Normal Form, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.		

4.	Transaction Management	10 Hours	22%
	Transaction concepts, A Simple Transaction Model, ACID properties, serializability of Transaction, Testing for Serializability.		
5.	Concurrency Control and Recovery System	10 Hours	22%
	Lock based concurrency control, Deadlock, Two-phase locking protocol, Two- Phase Commit protocol, Time stamping methods, Database recovery management, Failure Classification, Recovery and Atomicity, Log-based recovery, Transaction rollback and checkpoints, System recovery.		
6.	Indexing	05 Hours	12%
	Basic Concepts, Ordered Indices, B+ Tree Index Files, B-Tree Index Files.		

C. Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, etc.
- Internal exams/Unit tests/Surprise tests/Quizzes/Seminar/Assignments etc. will be conducted as a part of continuous internal theory evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments/Tutorials related to course content will be carried out in the laboratory.

D. Student Learning Outcome:

After learning the course, students will able to

CO1	Identify and evaluate the constructs in the E-R model and issues involved in developing an E-R diagram. Convert an E-R diagram into a relational database schema. Declare and enforce integrity constraints on database using a state-of- art RDBMS.
CO2	Demonstrate the basic elements of a relational database management system.
CO3	Design entity relationship, Convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.
CO4	Demonstrate their understanding of transactions processing and recovery techniques to recover from the crashes.
CO5	Understand the uses of Database Schema and need of Normalization and Extend normalization for the development of application software 's.

Course Articulation Matrix:

	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	-	3	2	2	-	-	-	-	-	-	-	-	1	-
CO2	3	-	-	-	1	-	-	-	-	-	-	-	3	-
CO3	-	-	3	2	3	-	-	-	-	-	-	-	-	2
CO4	3	-	1	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	3	2	3	-	-	-	-	-	-	-	2	2

E. Recommended Study Material:**❖ Text Books:**

- Database System Concepts, Abraham Silberschatz, Henry F. Korth & S.Sudarshan, McGraw Hill.
- An introduction to Database Systems, C J Date, Addition-Wesley

❖ Reference Books:

- “Fundamentals of Database Systems”, R. Elmasri and S. B. Navathe, The Benjamin /Cumming Pub. Co
- SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, BPB Publications Oracle: The Complete Reference, George Koch, Kevin Loney, Oracle Press.

❖ Web Materials:

- <http://www.sql.org>
- <http://www.w3schools.com>
- <http://www.sqlcourse.com>
- https://www.youtube.com/playlist?list=PLUd8M7XZdd6FT24ouEYl4RPpgXY9c_1uI