

## DATABASE MANAGEMENT SYSTEMS

<b>II B. TECH- I SEMESTER</b>								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
<b>A4CS05</b>	<b>PCC</b>	3	-	-	3	30	70	100
<b>COURSE OBJECTIVES:</b>								
<p><b>The course should enable the students to:</b></p> <ol style="list-style-type: none"> <li>1. Learn to develop an E-R model.</li> <li>2. Apply database design concepts to design a schema using various data models.</li> <li>3. Analyze schema and perform schema refinement by applying normalization</li> <li>4. Identify various issues related to transactions, concurrency, storage and mechanisms of transaction management, concurrency control.</li> <li>5. Study Query processing &amp; Query optimization</li> </ol>								
<b>Course Outcomes:</b>								
<p>At the end of the course the students are able to:</p> <ol style="list-style-type: none"> <li>1. Use the basic concepts of Database Systems in Database design</li> <li>2. Apply SQL queries to interact with Database</li> <li>3. Design a Database using ER Modeling</li> <li>4. Apply normalization on database design to eliminate anomalies</li> <li>5. Analyze database transactions and can control them by applying ACID properties.</li> </ol>								
<b>UNIT-I</b>	<b>INTRODUCTION</b>						<b>Classes: 11</b>	
Introduction and applications of DBMS, Purpose of data base, Data, Independence, Database System architecture- Levels, Mappings, Database, users and DBA DATABASE DESIGN: Database Design Process, ER Diagrams - Entities, Attributes, Relationships, Constraints, keys, extended ER features, Generalization, Specialization, Aggregation, Conceptual design with the E-R model.								
<b>UNIT-II</b>	<b>RELATIONAL MODEL AND SQL</b>						<b>Classes: 16</b>	
Introduction to the relational model, Integrity constraints over relations, Enforcing integrity constraints, Querying relational data, Logical database design: E-R to relational, Introduction to views, Destroying/altering tables and views. RELATIONAL ALGEBRA AND CALCULUS: Preliminaries, relational algebra operators, relational calculus - Tuple and domain relational calculus, SQL: Basics of SQL, DDL,DML,DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, Functions - aggregate functions, Built-in functions – numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All, view and its types. Transaction control commands – Commit, Rollback, save point, cursors, stored procedures, Triggers.								
<b>UNIT-III</b>	<b>SCHEMA REFINEMENT</b>						<b>Classes: 12</b>	
Introduction to schema refinement, functional dependencies, reasoning about FDs. Normal forms: 1NF, 2NF, 3NF, BCNF, properties of decompositions, normalization, schema refinement in database design, other kinds of dependencies overview of 4NF, 5NF, DKNF, case studies.								
<b>UNIT-IV</b>	<b>TRANSACTION AND CONCURRENCY CONTROL</b>						<b>Classes: 11</b>	

Transaction concept, transaction state, implementation of atomicity and durability, concurrent executions, Serializability, recoverability, transaction definition in SQL, testing for Serializability.		
<b>CONCURRENCY CONTROL AND RECOVERY SYSTEM:</b> Concurrency control locks based protocols, time-stamp based protocols, validation based protocols, multiple granularity. Recovery system - failure classification, recovery and atomicity, log based recovery, shadow paging, recovery with concurrent transactions, failure with loss of non-volatile storage, advanced recovery techniques, remote backup systems.		
<b>UNIT-V</b>	<b>QUERY PROCESSING &amp; Q UERY OPTIMIZATION</b>	<b>Classes: 10</b>
Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, evaluation plans, and materialized views OVERVIEW OF STORAGE AND INDEXING: Tree structured indexing - intuition for tree indexes, indexed sequential access method (ISAM), B+ Trees - a dynamic tree structure.		
<b>TEXT BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Korth, Database Systems, 6th Edition.</li> <li>2. Database Management Systems 3rd Edition by by <a href="#">Raghu Ramakrishnan</a> and <a href="#">Johannes Gehrke</a></li> </ol>		
<b>REFERENCE BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Navathe Elamsri, Fundamentals of Database systems.</li> </ol>		
<b>WEB REFERENCES:</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://www.learnadb.com/databases/how-to-convert-er-diagram-to-relational-database">http://www.learnadb.com/databases/how-to-convert-er-diagram-to-relational-database</a></li> <li>2. <a href="https://www.w3schools.com/sql/sql_create_table.asp">https://www.w3schools.com/sql/sql_create_table.asp</a></li> <li>3. <a href="http://www.edugrabs.com/conversion-of-er-model-to-relational-model/?upm_export=print">http://www.edugrabs.com/conversion-of-er-model-to-relational-model/?upm_export=print</a></li> <li>4. <a href="http://ssyu.im.ncnu.edu.tw/course/CSDB/chap14.pdf">http://ssyu.im.ncnu.edu.tw/course/CSDB/chap14.pdf</a></li> <li>5. <a href="http://web.cs.ucdavis.edu/~green/courses/ecs165a-w11/8-query.pdf">http://web.cs.ucdavis.edu/~green/courses/ecs165a-w11/8-query.pdf</a></li> </ol>		
<b>E-TEXT BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://www.freebookcentre.net/Database/Free-Database-Systems-Books-Download.html">http://www.freebookcentre.net/Database/Free-Database-Systems-Books-Download.html</a></li> <li>2. <a href="http://www.ddegjust.ac.in/studymaterial/mca-3/ms-11.pdf">http://www.ddegjust.ac.in/studymaterial/mca-3/ms-11.pdf</a></li> </ol>		
<b>MOOC COURSE</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.mooc-list.com/tags/dbms-extensions">https://www.mooc-list.com/tags/dbms-extensions</a></li> <li>2. <a href="https://onlinecourses.nptel.ac.in/noc18_cs15/preview">https://onlinecourses.nptel.ac.in/noc18_cs15/preview</a></li> </ol>		