

**Name of the Programme: MSc Integrated**

**Course Code: IMC- 304**

**Title of the Course: Database Management Systems**

**Number of Credits: 6(4L-0T-2P)**

**Effective from AY: 2020-21**

<b>Prerequisites for the course:</b>	Operating Systems, Data and File Structures, A programming language	
<b>Objectives:</b>	To Provide students with theoretical knowledge and practical skills to effectively design , implement and query a relational database application	
<b>Content Theory:</b>	<b>Basic concepts</b> Database & Database Users, Characteristics of the Database Approach, Database Systems, Concepts & Architecture Data Models, Schemes & Instances, DBMS Architecture of Data Independence, Data Base languages & Interfaces	6 hours
	<b>Relational Model</b> The Relational Model, Overview of Design Process, Data Modelling using the Entity – Relationship approach , Structure of Relational Databases, Relational Algebra	10 hours
	<b>SQL-A Relational Database Language Data</b> Data Definition in SQL, structure of SQL queries, Set operations, aggregate functions, Nested Subqueries, Modification of the database, Views Specifying Integrity Constraints & Indexes in SQL. A Relational Database Management System	12 hours
	<b>Relational DataBase Design</b> Features of a Good Relational design, Function Dependencies & Normalization , Normal forms based on primary keys (1NF, 2NF, 3NF, BCNF) Covers of Functional Dependencies, Canonical covers. Loss less join and Dependency preserving decomposition algorithms.	10 hours
	<b>Transactions</b> Concept and states of transactions, Properties of Transactions, issues in Concurrent execution of transactions, concept of serializability, Recovery techniques	10 hours

<b>Content Practical:</b>	<b>Suggested Lab Assignments:</b> <ul style="list-style-type: none"> <li>• <b>Installation of DBMS Software</b></li> </ul>	6 hours
	<b>A. Data Definition Language(DDL) Statements</b> <ol style="list-style-type: none"> <li>1. Creating tables, with or without constraints.</li> <li>2. Understanding Data types.</li> <li>3. Creating User Defined data Types</li> <li>4. Altering the structure of the table</li> <li>5. Dropping tables.</li> <li>6. Creating Sequences</li> </ol>	6 hours
	<b>B. Query in Data Dictionary</b> <ol style="list-style-type: none"> <li>1. To view the structure of the table created by the user.</li> <li>2. To view user information.</li> <li>3. To view integrity constraints.</li> </ol> <b>C. Data Manipulation Language(DML) Statements</b>	6 hours

	<ol style="list-style-type: none"> <li>1. Inserting Data into the table.</li> <li>2. Updating Data into the table.</li> <li>3. Deleting Data from the table.</li> </ol>	5 hours
	<b>D. Simple SQL statements</b> <ol style="list-style-type: none"> <li>1. Displaying all the attributes and tuples from the table.</li> <li>2. Displaying selected attributes/tuples from the table.</li> <li>3. Using Logical and comparison operators.</li> <li>4. Ordering data</li> </ol>	5 hours
	<b>E. Complex SQL Statements</b> <ol style="list-style-type: none"> <li>1. Using aggregate functions (using Group by and having clauses).</li> <li>2. Creating SQL Aliases and View.</li> <li>3. Joins and Nested queries.</li> <li>4. Creating temporary tables in SQL statements</li> </ol> <b>F. Transaction Control Language(TCL) statements</b> <b>G. Embedded SQL statements</b> <ol style="list-style-type: none"> <li>1. Procedures with and without cursors</li> </ol>	5 hours 5 hours
<b>Pedagogy:</b>	Lectures/ tutorials/assignments/class presentations and debates/peer reviews / workshops /self-study	
<b>References/Readings</b>	<ol style="list-style-type: none"> <li>1. Korth, Silberchartz, “ Database System Concepts” McGrawhill Publication.</li> <li>2. Elmasri and Navathe, “ Fundamentals of Database Systems”, Addison Wesley, New Delhi.</li> <li>3. Database Management Systems –R. Ramakrishnan, J.Gehrke – T.McGraw Hill</li> <li>4. Desai B., “ An Introduction to Database Concepts”, Galgotia Publications, New Delhi.</li> <li>5. Rob,Coronel, “Database Systems (Design, Implementation and Management)”</li> <li>6. Date C. J. , “ An Introduction to Database Systems”, Publication House, New Delhi.</li> </ol>	

<b>Course Outcomes</b>	<ol style="list-style-type: none"><li>1. Understand and evaluate the role of database management systems in information technology applications within organizations;</li><li>2. Recognise and use logical design methods and tools for databases and Implement a database solution to an information technology problem;</li><li>3. Understand the SQL data definition and SQL query languages and Develop sophisticated queries to extract information from databases.</li><li>4. Understand how the database manages and recovers from concurrent and multiple transactions</li></ol>
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