Name of the Programme: MCA
Course Code: CSA-508
Title of Course: Database Management Systems
Number of Credits: 2 (2L-0T-0P)
Effective from AY: 2022-23

Prerequisites for the course	A High-Level Programming Language, Data Structures and Algorithms(CS101), Operating Systems(CS103).	
Objectives	This course will enable the learner to understand the different issues involved in the design and implementation of a database system and provide both theoretical knowledge and practical skills required in the creation and use of a Relational DataBase Management System.	
Content	**Basic concepts:** Database & Database Users, Characteristics of the Database Approach, Database Systems, Concepts & Architecture Data Models(RDBMS, Legacy systems, Object Oriented, NoSQL), Schemes & Instances DBMS Architecture of Data Independence, Database languages & Interfaces	3 hours
	Data Modelling using the Entity – Relationship approach	4 hours
	Relational Model, Languages & Systems Relational Data Model & Relational Algebra Relational Model Concepts Relational Model Constraints, Relational Algebra/Relational Calculus	5 hours
	SQL-A Relational Database Language Data SQL - DDL, DML. Views & Queries in SQL. Specifying Constraints & Indexes in SQL. Nested Subqueries, correlated Subqueries	2 hours
	Advanced SQL Embedded SQL, Dynamic SQL, Triggers and Stored Procedures.	2 hours
	Relational Database Design Function Dependencies & Normalization for Relational Database Functional Dependencies Normal forms based on primary keys (1NF, 2NF, 3NF, BCNF) Covers of Functional Dependencies, Canonical covers. Lossless join and Dependency preserving decomposition algorithms.	5 hours
	Transactions and Recovery Techniques Concept of a transaction, Recovery concepts, Recovery Techniques.	4 hours
	Concurrency Control Serializability, Locking Techniques, Time stamp ordering Granularity of Data items	5 hours
Pedagogy	Hands-on assignments / tutorials / peer-teaching / troubleshooting	
References/ Readings	**Main Reading** 1. Korth, Silberchartz, " Database System Concepts" McGrawhill Publication. 2. Elmasri and Navathe, " Fundamentals of Database Systems", Addison Wesley, New Delhi. 3. Database Management Systems –R. Ramakrishnan, J.Gehrke – T.McGraw Hill 4. Desai B., " An Introduction to Database Concepts", Galgotia Publications, New Delhi. 5. 2. Rob,Coronel, "Database Systems (Design, Implementation and Management)" 6. Date C. J. , " An Introduction to Database Systems", Publication House, New Delhi.	
Course	1. Understand and evaluate the role of a DBMS in information	

Outcomes	Technology applications in Organizations.	
	2. Recognise and use logical design methods and tools required in the design of DB applications.	
	3. Understand the relational database design principles.	
	4. Implement a database Solution to an IT Platform.	
	5. Understand the basics of SQL and construct queries using SQL.	
	6. Develop sophisticated queries to extract information from databases.	
	7. Use embedded SQL queries in a Host Level Language. Understand how the DBMS manages and recovers from concurrent and multiple transactions.	