G H RAISONI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, New Delhi and Recognized by DTE, Maharashtra)
An Autonomous Institute Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Accredited by NAAC with A+ Grade
Shraddha Park, B-37-39/1, MIDC, Hingna-Wadi Link Road, Nagpur-440016 (INDIA)
Phone Nos.: +91-07104-236102 Fax: +91-07104-236100
Email: - ghrietn@raisoni.net Web: - www.ghrietn.raisoni.net

Department of Science & Technology
Syllabus

MCA Semester-I

MCAL102 **: Database Management Systems**

Teaching Scheme				Credits	Continuous Evaluation Scheme					
					Theory			Practical		Total
Th.	Tu	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext	
3	-	-	3	3	20	30	50	-	-	100

Course Objectives	**1.** To understand the basic concepts and the applications of database systems.
	2. To master the basics of SQL and construct queries using SQL.
	3. To understand the relational database design principles.
	4. To become familiar with the basic issues of transaction processing and concurrency control.
	5. To become familiar with database storage structures and access techniques.
Course Outcomes	**1.** Describe the basic concepts of DBMS and various databases used in real applications.
	2. Design relational database using E-R model, normalization and nonprocedural structural query languages for various database applications
	3. Apply concepts of Object Based Database, XML database and non-relational databases
	4. Explain the concept transaction management and Concurrency management for real applications
	5. Elaborate the concept Backup and Recovery Systems

Course Contents:

Unit	Contents	Hours
I	**Basic concepts-** Introduction, A Historical Perspective, Database and Need for DBMS, Characteristics, Users, Views, schema, 3-tier architecture, Introduction of Parallel, Distributed Databases. Models (Relational model, Object Models), Advantages and disadvantages of each model	12
II	**Data Modeling and Relational Database:-** Introduction to the Relational Model, Entities-attributes, Relationship, Attributes, relationship set, Keys, Codd's rules, Generalization, aggregation, ER diagrams, Normalization (1 NF, 2 NF, 3 NF, BCNF), Introduction to SQL, DDL, DML Queries.	10
III	**Databases and applications: -** Obstacles using Relational Data Model & Emergence of Special Databases, Object Oriented Databases (OODBMS), Feature, Advantages of OODBMS Architecture, ODL, OQL, OODBMS Vs RDBMS, Object Relational Database, Schema, Mapping, XML, Structure of XML Data, XML Document Schema, Querying and Transformation, Application Program Interfaces to XML, Storage of XML Data, XML Applications.	12
IV	**Transaction and Concurrency: -** Concept of transaction processing, ACID properties, States of transaction, Serializibility and testing for serializibility, Concurrency control, schemes, Locking techniques, Timestamp based protocols, Granularity of data items, Deadlocks	10
V	**Backup and Recovery Systems:-** Failure classifications, Recovery & Atomicity, Log base recovery, Recovery with concurrent transactions, Failure with loss of non-volatile storage, Database backup & recovery from catastrophic failure, Remote backup system	10

Text Books	1. Database Systems Concepts: Silberschatz, Korth, Sudarshan, McGraw-Hill.
	2. An Introduction to Database Systems: Bipin C. Desai, Galgotia.
	3. An Introduction to Database Systems: C.J.Date, Narosa.
	4. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw Hill Education (India) Private Limited, 3rd Edition.
Reference Books	1. Introduction to database systems C.J.Date, Pearson
	2. Database system concept Korth, TMH,5th Ed.
	3. Principles of Database Management James Martin, PHI.
	4. Database Management systems Ramakrishna &Gehrke, McGrawHill,3rd Ed.
	5. Database Management Systems Bipin Desai, Galgotia Pub.
On-line TL Material	