

R.T.M. Nagpur University, Nagpur
FOUR YEAR B.E. COURSE
(Revised Curriculum as per AICTE Model Curriculum)
Computer Science and Engineering
B.E. Second Year Proposed Scheme

Fourth Semester:-

S N	Subject	Teaching Scheme			Evaluation Scheme			Credits	Category
		L	T	P	CA	UE	Total		
1	Discrete Mathematics and Graph Theory	03	-	-	30	70	100	03	PCC-CS
2	Data Structure and Program Design	03	01	-	30	70	100	04	PCC-CS
3	Database Managements Systems	03	01	-	30	70	100	04	PCC-CS
4	Computer Networks	03	-	-	30	70	100	03	PCC-CS
5	Theory of Computation	03	01	-	30	70	100	04	PCC-CS
6	System Programming	03	-	-	30	70	100	03	PCC-CS
7	Data Structure and Program Design-Lab	-	-	02	25	25	50	01	PCC-CS
8	Database Managements Systems-Lab	-	-	02	25	25	50	01	PCC-CS
9	Computer Workshop-II (Python)	-	-	02	25	25	50	01	PCC-CS
10	Constitution of India (Audit Course)	02	-	-	-	-	-	Audit	MC
Total		20	03	06			750	24	

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FOUR YEAR BACHELOR OF ENGINEERING (B.E.) DEGREE COURSE
SEMESTER: FOURTH (C.B.S.C)
BRANCH: COMPUTER SCIENCE AND ENGINEERING

Subject: Database Management Systems

Subject Code: BECSE403T

Load	Credit	Total Marks	Sessional Marks	University Marks	Total
3 hrs (Theory)	03	100	30	70	100

Aim: To understand and implement the concepts of databases in order to gain the proficiency at application level.

Prerequisite(s): Basic calculus mathematics and Concept of file processing.

Course Objective/Learning Objective:

1	To understand general idea of database management systems.
2	To develop skills to design databases using data modeling and design techniques.
3	To develop skills to implement real life applications which involve database handling.
4	Demonstrate an understanding of career opportunities in subject areas of designing, storage techniques, data handling and managing techniques

Course Outcome:

At the end of this course Student are able to:

CO1	Understand basic database concepts and data modeling techniques used in database design.
CO2	Study the concept of functional dependency and Perform the calculus with Design database by using different normalization technique.
CO3	Study query processing and Perform optimization on query processing.
CO4	Understand the concept of transaction processing and different recovery technique used in RDBMS.
CO5	Study and Implement advanced databases which are used real time system.

UNIT I:

Introduction to database systems: Approaches to building a database, Three-schema architecture of a database, Challenges in building a DBMS, DBMS Architecture-Variou components of a DBMS, Types of data models.

UNIT II:

Relational Data Model: Concept of relations, Schema-instance distinction, Keys, referential integrity and foreign keys, Relational algebra operators, Tuple relation calculus, Domain relational calculus. **Physical and logical hierarchy:** Concept of index, B-trees, hash index, function index, bitmap index. Concepts of Functional dependency, Normalization (1NF,2NF,3NF,BCNF, etc).

UNIT III:

Query Processing and Optimization: Query Processing and Optimization process, measures of query cost estimation in query optimization, pipelining and Materialization, Structure of query evaluation plans.

UNIT IV:

Transactions: Transaction concepts, properties of transactions, Serializability of transactions, Testing for serializability, System recovery, Two-Phase Commit protocol, Recovery and Atomicity, Log based recovery, concurrent executions of transactions, Locking mechanism, solution to concurrency related problems, deadlock, two-phase locking protocol, Isolation.

UNIT V:

Recovery System and advanced databases: Failure classification, recovery and atomicity, log based recovery, checkpoints, buffer management, advanced recovery techniques, Web databases, Distributed databases, Data warehousing, Data mining, Data Security, NOSQL databases.

Textbooks:

- Database System Concepts by Avi Silberschatz, Henry F. Korth, S. Sudarshan, Tata McGraw Hill, Fifth Edition.
- Fundamentals of Database Systems – Elmasiri and Navathe, Addison Wesley, 2000.
- An introduction to Database Systems, C J Date, A. Kannan, S. Swamynathan –Eight Edition.

Reference books:

- Database Management Systems - by Raghu Ramakrishnan and Johannes Gehrke, Tata McGraw Hill Publication, Third Edition.
- Introduction to Database Management Systems by Kahate, Pearson Education.

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Load	Credit	Total Marks	Sessional Marks	University Marks	Total
2 hrs (Practical)	01	50	25	25	50

- Ten Practicals based on above syllabus. Course coordinator should make sure that all units will be covered in their list. No study experiment should be included in the list.