ST. ALOYSIUS COLLEGE(AUTONOMOUS), JABALPUR

Reaccredited 'A+ 'Grade by NAAC(CGPA:3.68/4.00)
College with Potential for Excellence by UGC
DST-FIST Supported & STAR College Scheme by DBT

Faculty of Science

Bachelor of Computer Application
BCA III Semester
Paper: -Minor
Database Management System

Course Outcomes

CO. No.	Course Outcomes	Cognitive Level
CO 1	Understand the fundamental concepts of databases and DBMS, including their components, functions, and characteristics, and compare traditional file systems with DBMS.	Understanding
CO 2	Analyze the three-level database architecture (external, conceptual, internal) and various data models (Hierarchical, Network, Relational) to evaluate their significance in database design.	Analysing
CO 3	Apply the principles of the Entity-Relationship model to construct ER diagrams and convert them into relational tables, including the use of extended ER models.	Applying
CO 4	Evaluate the use of relational algebra operations and relational calculus to solve complex queries, and analyse the integrity constraints to maintain database consistency.	Evaluating
CO 5	Create and implement SQL queries and PL/SQL procedures, triggers, and functions to manage and manipulate databases effectively, while demonstrating exception handling techniques.	Creating

Credit and Marking Scheme

	Credits	Marks		Total Marks
		Internal	External	
Theory	4	40	60	**100**
Practical	2	40	60	**100**
Total	**6**	**200**		

Evaluation Scheme

	Marks	
	Internal	External
Theory	3 Internal Exams of 20 Marks (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of the Semester)
Practical	3 Internal Exams (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of the Semester)

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BCA III Semester   **Paper: -Minor**

Database Management System
Theory

No. of Lectures (in hours per week): 2 Hrs. per week
Total No. of Lectures: 60 Hrs.   **Maximum Marks:** 60

Units	Topics	No. of Lectures
I	**Database Concepts:** Database and DBMS, Comparison between traditional file and DBMS, Characteristics, Components and Functions of DBMS, Advantages and disadvantages of the DBMS, DBMS users, Database administrator, ACID properties. **Database Design and Architecture:** Essentials of Database Design, Three level Architecture of Database- external, conceptual and internal, Data Models concepts: Hierarchical, Network and Relational, Operators, relations, domains and attributes, keys, traditional set operations, special relational operations.	12
II	**The E/R model:** Components of ER Diagram (Entity, attributes and relation), Notations for E-R diagram, Mapping Constraints, Extended E-R model (Generalization, Specialization and aggregation), Convert ER into table, Decomposition of tables. **Functional Dependency:** Introduction, types of FDs :- Trivial, Non- Trivial, Multivalued and Transitive FD. **Normalization:** Normalization Process, 1st NF , 2nd NF, 3rd NF, 4th NF and 5th NF, Relational decomposition.	12
III	**Relational algebra**: introduction, Selection and projection, set operations, renaming, Joins, Division, Tuple relational calculus, Domain relational Calculus, What is constraints, types of constrains, Integrity constraints.	12
IV	**SQL**: SQL commands: Data Definition Language, Data Manipulation Language and Transaction Control Language, index, view, Pattern Matching: like predicate, in, not in, between, not between, any, all, exist, order by, aggregate functions, group by, Sub query, Joining: inner, outer and Cartesian join. **SQL functions**: string functions, date functions, math functions.	12
V	Introduction to PL/SQL, variable, constant, control statements: if, case, loop, exit loop, for loop, continue and goto. Local and stored procedure, local and stored function, Database Trigger, Cursor, Exception handling: system defined and user defined exception.	12

TEXTBOOKS:

- Gary W. Hansen & James V. Hansen,Database Management and Design,Prentice Hall of India Pvt Ltd.
- Ramez Elmasri, Shamkant Navathe,Fundamentals of Database Systems,Pearson
- Prateek Bhatia and Gurvinder Singh, Simplified approach to DBMS.

REFERENCE BOOK:

- C.J. Date,An Introduction to Database System,Pearson
- Abraham Silberschatz , Henry F. Korth, S. Sudharshan,Database System Concepts,Tata McGraw Hill

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Database Management System

List of Practical

1. To draw ER Model and Relational Model for a given database. Show ER to Relational Model reduction.
2. Implementation of Database
   a. Creation of Database with proper constraints
   b. Insert into database using different types of insert statements
   c. Display

3. Data Definition (schema) Modification

4. Simple SQL queries (Single table retrieval)
   a. Make use of different operators (relational, logical etc.)
   b. Selection of rows and columns, renaming columns, use of distinct keyword
   c. String handling (%, etc.)
   d. Update statement
   e. Delete

5. Advanced SQL Queries-1

   a. Group by, having clause, aggregate functions
   b. Set operations like union, union all and use of order by clause
   c. Nested queries: in, not in, exists, not exists and any, all

6. Advanced SQL Queries -2

   a. Join (Inner & Outer)
   b. Exists & Union

7. PL/SQL:
   a. Implement trigger.
   b. Implement cursor