# SCHEME OF COURSE WORK

**Course Details:**

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| **Course Title** | **: ADVANCED DATABASE MANAGEMENT SYSTEMS** | | |
| **Course Code** | **:13CS2104** | **L T P C** | **:4 0 0 3** |
| **Program:** | **: M.Tech.** | | |
| **Specialization:** | **: Computer Science Engineering** | | |
| **Semester** | **:Ist Semester** | | |
| **Prerequisites** | **: Data base management systems, Distributed Databases** | | |
| **Courses to which it is a prerequisite** | **: Data mining.** | | |

**Course Outcomes (COs):**

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| 1 | Describe storage technology solutions. |
| 2 | Describe various queries in databases like RDBMS, ORDBMS AND OODBMS. |
| 3 | Understand the concepts of XML query processing's and script languages' |
| 4 | Familiar with the basic issues of transaction processing and concurrency control. |
| 5 | Master the basics of query evaluation and query optimization techniques. |

**Program Outcomes (POs):**

A graduate of Computer Science engineering will be able to

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| 1 | Demonstrate knowledge in core subjects of Computer Science and Engineering and the ability to learn independently. |
| 2 | Will demonstrate the ability to solve problems relevant to industries and Research Development. |
| 3 | Demonstrate the ability to design a Software application or a process that meets desired specifications within the realistic constraints. |
| 4 | Develop innovative thinking capabilities to promote research in several areas related to Computer Science and Engineering. |
| 5 | Familiar with modern engineering software tools and equipment to analyze Computer Science and engineering problems |
| 6 | Demonstrate the ability to collaborate with engineers of other disciplines and work on projects which require multidisciplinary skills |

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| 7 | Will acquire project management and finance control abilities |
| 8 | Able to communicate effectively in both verbal and written forms |
| 9 | Updating knowledge in whatever field they work through lifelong learning |
| 10 | Uunderstanding of ethical and social responsibilities in Global and societal contexts |
| 11 | Graduate will demonstrate the abilities to carry out tasks by working independently and also in a group of engineers |
| 12 | .Understand various Computer science applications in various broad areas of engineering and social management. |

**Course Outcome** versus **Program Outcomes:**

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
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| **CO-1** | | | | | S | | | | | | | M |
| **CO-2** | | | S | | | | M | | | | | |
| **CO-3** | | | | | | | | | S | | | M |
| **CO-4** | | | | | | M | | | | | | |
| **CO-5** | | | | | | | | | | | | M |

*S* - Strongly correlated, *M* - *Moderately* correlated, *Blank* - *No correlation*

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| **Assessment Methods:** | Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam |

## Teaching-Learning and Evaluation

| Week | TOPIC / CONTENTS | Course Outcomes | Sample questions | TEACHING-LEARNING STRATEGY | Assessment Method & Schedule |
|---|---|---|---|---|---|
| 1 | History of Data base Systems. Data base System Applications, data base System VS file System.<br><br>data Models – the ER Model – Relational Model – Other Models | CO-1 | 1. Define Er model and draw the er diagram for online banking | ▫ Lecture<br>▫ Demonstration | Assignment (Week 3 - 5) |
| 2 | Database Languages – DDL – DML. Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design | CO-1 | 1.Explain various SQL – models with examples | ▫ Lecture / Discussion<br>▫ Case study | Mid-Test 1 (Week 9) |
| 3 | – Introduction to Views – Destroying | CO-1 | !.Write queries on advanced data structures on object databases | ▫ Lecture<br>▫ Case study | Seminar (Week 2 - 6) |

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| | /altering Tables and Views**.** Introduction of Object Database Systems, Structured Data types, operations on structured data, Encapsulation and ADTS, Inheritance | | with examples | | |
| 4 | Database design for ORDBMS, ORBMS implementation and challenges, OODBMS, | CO-1 & CO-2 | 1. Differentiate between ORDBMS and ORDBMS | | |
| 5 | comparison of RDBMS, OODBMS and ORDBMS. | CO-1 & CO-2 | 1. Compare RDBMS and OODBMS with example queries | | |
| 6 | Introduction to Parallel databases, architectures for parallel databases, Parallel Query Evaluation – data partitioning and parallelising sequential operator evaluation code, Parallelising individual operations, and parallel Query optimization. | CO-4 | !.Draw the architecture of parallel database .<br>2. Explain the fragmentation techniques involved in parallel databases. | | |
| 7 | Introduction to distributed databases; features of distributed databases vs centralized databases, Why distributed databases, DDBMS, | CO-4 | 1. Differentiate between distributed versus central databases with architecture model | | |
| 8 | levels of transparency- reference architecture for DDB | CO-5 | 1.Explain the architecture of DDB with neat sketch and program | | |
| **9** | **Mid-Test 1** | CO-5 | | | |
| 10 | types of data fragmentation, distribution transparency for read-only and update applications | CO-5 | 1.Explain the fragmentation models with equations | ▫ Lecture<br>▫ Discussion<br>▫ Case study | Mid-Test 2 (Week 18) |
| 11 | distributed database access primitives, Integrity Constraints in Distributed databases | CO-4 & CO-5 | 1.Write a program for integrity constraints in distributed database | | Seminar (Week 10 - 14) |
| 12 | Distributed database design: framework for distributed database design, the design of database fragmentation, allocation of fragments | CO-5 | 1.Explain the various models of allocation methods involved in fragmentation | | |
| 13 | Distributed Query processing: Equivalence of transformations for queries, transforming global queries into fragment queries | CO-4 | 1.What is meant by query processing and explin briefly about global queries | | |
| 14 | distributed grouping and aggregation functions, parametric queries. | CO-5 | 1. Define aggregate functions in Database and draw parametric tree for aggregate functions in DDB. | | |
| 15 | A framework for query optimization, join queries and general queries. non- | CO-5 | 1. Explain various methods involved in query optimization models. | | Case study (Week 15) |

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| | join queries in a distributed DBMS, joins in a distributed DBMS, cost based query optimization. | | | | |
| 16 | ). DBMS Vs IR systems, Introduction to Information retrieval, Indexing for text search, | CO-3 | 1. Differentiate between IR system and DBMS. | | |
| 17 | web search engine, managing text in a DBMS, a data model for XML, Querying XML data, and efficient evaluation of XML queries. | CO-3 | 1. Write a short notes on XML and show how database management better than XML with example queries | | |
| **18** | **Mid-Test 2** | | | | |
| **19/20** | **END EXAM** | | | | |