# 19CS3104 - ADVANCED DATABASE SYSTEMS

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| **Course Category:** | Program Core | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 3-0-0 |
| **Prerequisite:** | Require basics of database management system concepts. | **Sessional Evaluation:**  **Univ. Exam Evaluation:**  **Total Marks:** | 40  60  100 |
| **Course Objectives** | * To explain and evaluate the fundamental requirements that influences the design of modern database systems. * To assess and apply database functions and packages suitable for enterprise database development. * To evaluate alternative designs and architectures for databases and data warehouses * To discuss various advanced methods of storing, managing and interrogating complex data | | |

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| **Course Outcomes** | Upon successful completion of the course, the students will be able to: | |
| CO1 | Study various database systems architectures, merits and demerits |
| CO2 | Analyze parallel Databases to study various operations |
| CO3 | Understand Distributed databases types, supporting environment and storage |
| CO4 | Acquire knowledge on Object Based Databases to develop different applications |
| CO5 | Know the Enhanced E-R features and Advanced Application Developments in Database |
| CO6 | Specifies the Temporal and spatial Databases, and various transaction processing methods to apply for various domains |
| **Course Content** | UNIT – I  **Database-System Architectures**: Centralized and Client–Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems and Network Types.  UNIT – II  **Parallel Databases:**  I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism and Query Optimization.  UNIT – III  **Distributed Databases:** Homogeneous and Heterogeneous Databases, Distributed Data Storages, Distributed Transactions, Commit Protocols, Concurrency Control in Distributed Databases, Distributed Query Processing, Heterogeneous Distribute Databases.  UNIT – IV  **Object-Based Databases:** Overview, Complex Data Types, Structured Types and Inheritance in SQL, Table Inheritance, Array and Multiset Types in SQL, Object-Identity and Reference Types in SQL, Implementing O-R Features, Persistent Programming Languages, Object-Relational Mapping, Object-Oriented versus Object-Relational.  UNIT – V  **Database Design and the E-R Model:** Extended E-R Features, Alternative Notations for Modeling Data, Other Aspects of Database Design.  **Advanced Application Development:** Performance Tuning, Performance Benchmarks, Other Issues in Application Development Standardization.  UNIT – VI  **Spatial and Temporal Data and Mobility:** Motivation, Time in Databases, Spatial and Geographic Data, Multimedia Databases, Mobility and Personal Databases.  **Advanced Transaction Processing:** Transaction-Processing, Monitors Transactional Workflows, E-Commerce, Main Memory Databases, Real-Time Transaction Systems. | |
| **Text Books and References** | **Text Book:**   1. Abraham Silberschatz Henry F.Korth S.Sudarshan “Database System Concepts” Sixth Edition, PHI.   **Reference Books:**   1. Raghuram Krishnan and Johnnes Gherke “Database Management System” Second Edition. 2. Peter Rob, CarlosCoronel, A.Ananda Rao - “Database Management Systems”. | |
| **E-Resources** | 1. <http://www.nptelvideos.in/2012/11/database-management-system.html> 2. <http://www.cse.iitb.ac.in/infolab/Data/Courses/CS632/> | |