

IV/IV B. TECH. SECOND SEMESTER
SECURE DATABASE APPLICATION DEVELOPMENT (Elective- IV)

Course Code: CS 8T3D**Credits: 3****Lecture: 3 periods/ week****Internal assessment: 30 Marks****Tutorial: 1period/week****Semester end examination: 70 Marks**

Prerequisite : Database Management Systems, Information Security

Course Objectives:

1. This course aims to give an overview of various types of security threats to database and operating System. This course also covers the aspects of user administration, setting of user profiles, password policies, privileges and roles to users. This course also covers the various database security models, and database auditing models. This course will give the practical implementation of the above in Oracle and Microsoft SQL Server.

Course Outcomes:

At the end of this course student will:

CO1) Understand the need for security for the database and operating systems

CO2) Create users, and apply user Profiles, Password Policies, Privileges, and Roles

CO3) Understand various Database Application Security Models and their advantages

CO4) Understand the need for database auditing

CO5) Apply necessary auditing policies for database

Syllabus:**UNIT 1**

Security Architecture: Introduction, Security, Information Systems, Database management systems, Information security, Information security Architecture, database security, Asset types and their value, Security methods.

Operating System Security Fundamentals: Introduction, operating systems overview, security environment, components, Authentication methods, user administration, password policies, Vulnerabilities of operating systems, E- Mail security.

UNIT 2

Administration of Users: Introduction, user authentication, operating system authentication, creating/removing/modifying users, default/remote users, Database links, Linked servers, remote servers.

Profiles, Password Policies, Privileges, and Roles: Introduction, Defining and using profiles, Designing and implementing password policies, Granting and revoking user privileges, creating, Assigning and revoking user roles.

UNIT 3

Database Application Security Models: Introduction, Types of users, security models, application types, application security models and Data encryption. Virtual Private Databases (VPD): Introduction, Overview, implementing a VPD using views and application context. Implementing oracle VPD, Viewing VPD policies and application context using: data dictionary, policy manager, implementing row and column level security with SQL server.

UNIT 4

Database Auditing Models, Application Data Auditing: Database Auditing Models: Introduction, Auditing overview, environment, process, objectives, classification and types, benefits and side effects of auditing.

Application Data Auditing: Introduction, DML auction auditing architecture. Triggers, fine grained auditing, DML statement audit trail and auditing application errors with Oracle.

UNIT 5

Auditing Database Activities, Security and Auditing Project Cases: Auditing Database Activities: Introduction, usage of database activities, creating DLL triggers, auditing database activities with oracle.

Security and Auditing project cases: Introduction, case study for developing an online database, taking care of payroll, tracking database changes and developing a secured authentication repository.

Learning Resource**Text Books**

1. Database Security and Auditing, Hassan Afyouni, Cengage Learning, 2007
2. Database Security, S. Castano, M. Fugini, G. Martella, P. Samarati, Addison-Wesley, 1994
3. Implementing Database Security and Auditing, RonBen Natan: Elsevier, Indian reprint, 2006

References

1. Principles of Distributed Database Systems, Prentice Hall,2/e, M.TamerÖzsu, Patrick Valdureiz
2. Database Security, Castano, Fugini, Addison Wesley
3. The security Audit and control of Databases, Clark, Holloway, List, UK:Ashgate.
4. Security and Audit of Database System, Douglas, Blackwell(UK)
5. Database security and Integrity, Fernandez, Summers, Wood, Addison Wesley