



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering (Minor/Honours Degree Syllabus)

Subject Code : N117AH01

Subject Name : Database Security and Access Control

WEF Academic Year :	2026-27
Semester :	7
Category of the Course :	Compulsory

Prerequisite : Database Management.

Course Objective : The objective of the course is to provide fundamentals of database security. Various access control techniques mechanisms were introduced along with application areas of access control techniques.

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR		Theory		Practical		
			ESE (E)	PA(M)	ESE (V)	PA (I)		
03	00	02	04	70	00	30	00	100

Course Content :

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Module 1 : Introduction to Access Control, Purpose and fundamentals of access control.	7	15
2	Module 2 : Policies of Access Control, Models of Access Control, and Mechanisms, Discretionary Access Control (DAC), Non- Discretionary Access Control, Mandatory Access Control (MAC). Capabilities and Limitations of Access Control Mechanisms: Access Control List (ACL) and Limitations, Capability List and Limitations.	8	20
3	Module 3 : Role-Based Access Control (RBAC) and Limitations, Core RBAC, Hierarchical RBAC, Statically Constrained RBAC, Dynamically Constrained RBAC, Limitations of RBAC. Comparing RBAC to DAC and MAC Access Control policy, Integrating RBAC with enterprise IT infrastructures: RBAC for WFMSs, RBAC for UNIX and JAVA environments.	10	25
4	Module 4 : Smart Card based Information Security, Smart card operating system-fundamentals, design and implantation principles, memory organization, smart card files, file management. PPS Security techniques- user identification, smart card security, quality assurance and testing, smart card life cycle-5 phases, smart card terminals.	8	20



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering (Minor/Honours Degree Syllabus)

Subject Code : 117AH01

Subject Name : Database Security and Access Control

5	Module 5 : Cloud Data Security: Recent trends in Database security and access control mechanisms. Cloud Data Audit: Intro, Audit, Best Practice, Key management, Cloud Key Management Audit.	9	20
Total :			100

Text books / References :

1. Role Based Access Control: David F. Ferraiolo, D. Richard Kuhn, Ramaswamy Chandramouli.

Course Outcome :

After Completion of the Course, Student will able to :

Sr. No.	Course Outcomes	RBT Level*
01	To understand and implement classical models and algorithms.	UN
02	To analyze the data, identify the problems, and choose the relevant models and algorithms to apply.	AN
03	To assess the strengths and weaknesses of various access control models and to analyze their behaviour.	AN

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Corresponding Online Resources :

- <http://www.smartcard.co.uk/tutorials/sct-itsc.pdf> : Smart Card Tutorial.
- Advanced System Security Topics, <https://www.coursera.org/lecture/advanced-system-security-topics/role-based-access-control-rbac-bYvzS>.
