



GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering

WEF Academic Year	: 2021-22
Semester	: 2
Category of the Course	: Program Elective Course-IV
Course Name & Code	: Web and Database Security (4725906)

Prerequisite:

- Fundamentals of web technology, Database management system.

Rationale:

- This subject will give an introduction to security aspects in web applications and database systems. Students will be taught various types of attacks and risks to web applications and database systems. They will also learn how to mitigate those risks and attacks.

Course Scheme:

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
03	00	02	04	70	30	30	20	150

Course Content:

Sr No	Course Content	No of Hours	%
1	UNIT 1: Web Authentication Security HTTP and HTTPS Protocols, Web Functionality, Encoding Schemes, Authentication Techniques, Design Flaws in Authentication, Implementation Flaws in Authentication, Securing Authentication.	06	15
2	UNIT 2: Injection Attacks Injecting into Interpreted Contexts, SQL Injection, XPath Injection, LDAP Injection, XML Injection, HTTP Injection, Mail Service Injection.	06	15
3	UNIT 3: Cross Site Scripting (XSS) Types of XSS, XSS in Real World, Finding and Exploiting XSS Vulnerabilities, Preventing XSS Attacks.	06	15
4	UNIT 4: Database Security Models	06	15



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	Harrison-Ruzzo-Ullman Access Matrix Model, Wood et al. Model, Dion Model, The Sea View Model, The Lattice Model for Flow Control.		
5	UNIT 5: Database Security Design Introduction, Secure DBMS Design, Design of Secure Databases.	08	20
6	UNIT 6: Security Models for Next-generation Databases Security in Active Databases, Security in Object-oriented Database, The ORION Authorization Model, SORION Model, The Millen-Lunt Model.	08	20

Text Books/Reference Books:

1. The Web Application Hacker's Handbook by Dafydd Stuttard and Marcus Pinto, Wiley Publishing, Inc., 2008.
2. Database Security by S. Castano, M. Fugini, G. Martella and P. Samarati, Addison-Wesley Publishing Company.
3. Database Security by Alfred Basta and Melissa Zgola, Cengage Publication, 2012.
4. Oracle® Security Overview, 10g Release 1 (10.1), Part No. B10777-01, December 2003.
5. Oracle® Database Administrator's Guide 11g Release 1 (11.1) B28310-04 March 2008.

Course Outcome:

After completion of the Course, Students will be able to:

No	Course Outcomes	RBT Level*
01	Understand the authentication flaws in the web environment.	UN
02	Apply cross-site scripting, forgery and SQL injection attacks on the vulnerable web application.	AP
03	Examine the existing database security models.	AP
04	Compare & Contrast web and database security policies.	AN
05	Compare & Contrast security models for web and database.	AN

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

Suggested Course Practical List:

- The practical work will be carried out based on the content covered during the academic sessions.



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List of Laboratory/Learning Resources Required:

- Course-related online MOOCs on NPTEL/SWAYAM platform
- Recently Published papers/articles in reputed journals