Ganpat University
॥ विद्यया समाजोत्कर्षः ॥

Faculty of Computer Applications

Programme	B.Sc. IT Honours (Cyber Security)	**Branch**	Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2026-27	**Effective for the batch Admitted in**	June 2024
Subject code	U65A2WAS	**Subject Name**	WEB APPLICATION SECURITY

Teaching scheme

(Per week)	Lecture (DT)		Practical (Lab.)		Total
	L	TU	P	TW	
Credit	2	-	2	-	4
Hours	2	-	4	-	6

Examination scheme(Marks)

	CCE	SEE	Total
Theory	50	50	100

Objective:

To enable students to develop secure web applications by applying defensive programming principles, secure coding practices, and modern deployment techniques.

Pre-requisites:

Basic knowledge of PHP programming, web application structure, and foundational web security concepts.

Learning Outcome:

Name of CO	Description
CO1	Explain foundational concepts of web application security and vulnerabilities.
CO2	Use PDO in PHP for secure and efficient database interactions.
CO3	Apply secure coding practices to mitigate common attacks in PHP applications.
CO4	Build and deploy secure web applications using a PHP framework.
CO5	Handle errors, log events securely, and follow secure deployment practices.

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	1	3	2	1	1	2	1	0
CO2	3	2	3	1	2	2	1	1	1	1	1	0
CO3	3	3	3	2	3	3	2	2	1	2	2	1
CO4	3	3	3	2	3	2	1	2	2	3	2	2
CO5	2	2	2	2	2	3	2	1	2	2	2	1

Content:

Unit	Content	Hrs.
1	**Web Application Security Fundamentals:** Web Security Principles: Confidentiality, Integrity, Availability (CIA), Web Application Architecture & Threat Landscape, Introduction to OWASP Top 10, Secure SDLC (Software Development Life Cycle)	06
2	**Secure Database Handling using PDO:** Introduction to PHP Data Objects (PDO), Database Connection and Configuration, Executing Queries with Prepared Statements, Binding Parameters and Fetching Results, Error Handling using PDOException, Form Submission and Secure Data Insertion	06
3	**Secure Coding Practices and Defensive Programming in PHP:** Defensive programming and secure software design principles, Prevention of SQL Injection using prepared statements, Output encoding for preventing Cross-Site Scripting (XSS), Input validation and filtering techniques, Session management and security best practices, Cross-Site Request Forgery (CSRF) protection mechanisms	06

4	**Developing Secure Applications using PHP Framework:** Introduction to Frameworks and MVC Architecture, Directory Structure, Routing, and Controllers, Views and Templating, Secure Features: Input Validation, Built-in Authentication, Building a Simple CRUD Application with Security Practices	06
5	**Error Handling, Logging, and Secure Deployment:** Importance of secure error handling, Custom error pages and preventing information leakage, Logging best practices: content, storage, and access, Secure deployment checklist: Disabling display errors in production, File and folder permission settings, Enabling HTTPS, Minimal .htaccess hardening, Removal of development/test files	06

Practical Content:

List of practical specified by subject teacher based on above mentioned topics

Reference Books:

1	Web Application Security: Exploitation and Countermeasures for Modern Web Applications, Second Edition by Andrew Hoffman (2024)
2	Learn PHP & MySQL For Beginners: The Complete Guide to Database Web Development Fundamentals: A Comprehensive Handbook on Database Basics, Modern PHP Development and Real-World Application by PhiQuill Publishing (2025)
3	Getting started with Laravel 12, master the most popular PHP framework by by Andrés Cruz Yoris (2022)

Web Reference:

1	https://owasp.org
2	https://www.php.net/manual/en/book.pdo.php
3	https://portswigger.net/web-security
4	https://laravel.com/docs / https://codeigniter.com/user_guide

MOOC/Certificate Course:

1	https://www.coursera.org/projects/web-application-security-testing-with-owsap-zap
2	https://www.udemy.com/course/web-application-security-for-absolute-beginners-no-coding

Question Paper Scheme:

End Semester Examination Duration: (2 Hours Theory Examination)

Note for Examiner: -

Q-1 Any Five out of Seven (25 Marks)
Q-2 Any Two out of Three (06 Marks)
Q-3 Mandatory question (05 Marks)
Q-4 Any Two out of Three (08 Marks)
Q-5 Any Two out of Three(06 Marks)

*The question paper must comprehensively address all Course Outcomes (COs), align with Bloom's Taxonomy levels, and ensure complete syllabus coverage