GANPAT UNIVERSITY

FACULTY OF COMPUTER APPLICATIONS

Programme	Master of Computer Applications	**Branch/Spec.**	Computer Application
Semester	II	**Version**	1.0.0.0
Effective from Academic Year	2022-23	**Effective for the batch Admitted in**	June 2022
Subject Code	P12A4CS1	**Subject Name**	Cyber Security-I

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	2	0	2	0	2	Theory	40	60	100
Hours	2	0	4	0	6	Practical	20	30	50

Objective:

- To understand various cyber-attacks, how VA and PT tools can be useful for testing web application security for different types of attacks.

Pre-requisites:

- Basic Knowledge of web application, Database and SQL is essential, Hands of experience of Linux OS.

Course Outcomes :

- **1 = Slight (Low); 2 = Moderate (Medium); 3 = Substantial (High); "-" = No Correlation**

Name of CO	Description
CO1	Analyze cyber security concepts, cyber-attacks, and network protocol vulnerabilities.
CO2	Apply cryptographic techniques to ensure confidentiality, integrity, and authentication.
CO3	Evaluate web applications for security vulnerabilities and implement countermeasures.
CO4	Perform vulnerability scanning and penetration testing using industry-standard tools.

Mapping of CO and PO

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	3	1	2	1	-	2	1
CO2	3	2	2	2	1	-	3	1
CO3	2	3	2	3	1	-	3	1
CO4	2	3	3	3	2	1	3	2

Content:

Unit	SECTION – I	Hrs
1	**Basics of Cyber Security and Cyber Attacks** Cyber security, information security, overview of types of cyber security: infrastructure security, Application security, Network security, cloud security, internet of things security, CIA triads, overview of types of Cyber-attacks: Web	7

	based attacks- injection attacks, DNS spoofing, Session hijacking, phishing, pharming, social engineering, ransomware, brute force, denial of service, Man-in-the-middle attack, System based attack: virus, worms, Trojan horse, backdoors, Bots, OWASP top 10 attacks, case studies. **Basic of OSI and TCP/IP protocol Suite** Overview of OSI Model, TCP/IP Model layers, Understanding Protocols at all layers of TCP/IP.	
2	**Introduction to Cryptography** What is Cryptography, Modern (Encryption) cryptography: symmetric cryptography, asymmetric cryptography and hashing algorithm, classical (Encoding) cryptography: substitution, transposition. Digital signatures, Public key Infrastructure (PKI), Hybrid Cryptography (combination of symmetric and asymmetric cryptography).	8
	SECTION – II	
3	**Web Application Security** Input Validation Testing: Testing for Reflected Cross Site Scripting, Testing for Stored Cross Site Scripting, Testing for HTTP Verb Tampering, Testing for SQL Injection, testing for cross site request forgery, counter measures for web application attacks, Content Security Policies (CSP).	7
4	**Vulnerability scanner** The Basic Vulnerability Scan, overview of various tools for vulnerability scanning, Burp suite, Nessus, Nmap. Nmap commands, TCP three-way handshake protocol. **Penetration Testing** What is Penetration testing, Difference between Vulnerability assessment and Penetration testing, Introduction to Metasploit, Penetration test life cycle, tools for penetration is testing: virtual work station, Kali Linux machine, metasplotable2, Metasploit framework, commands of Metasploit, variables in Metasploit, Information gathering and enumeration of various protocols using Metasploit. Demo of exploiting the vulnerabilities like open ports and password cracking.	8

Practical Content:	
List of programs specified by the subject teacher based on above mentioned topics.	
Text Books:	
1	'Cryptography and Network Security' by Behrouz A Forouzan, Debdeep Mukhopadhyay,2nd Edition 2010.
2	CEH Certified Ethical Hacker Study Guide by Ric Messier Sybex 1st Edition 2019.
3	Metasploit for Begginers by Sagar Rahalkar Packt Publishing Ltd 2nd Edition 2020
Reference Books:	
1	Network Intrusion Alert: An Ethical Hacking Guide to Intrusion Detection by Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR
2	Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray, and George Kurtz, McGraw-Hill
3	Gray Hat Hacking: The Ethical Hacker's Handbook by Shon Harris
4	Ethical Hacking, Thomas Mathew OSB Publisher 1st Edition 2003
MOOC/Certification Courses:	
1	https://onlinecourses.nptel.ac.in/noc19_cs68/preview
2	https://www.coursera.org/learn/crypto
3	https://www.mygreatlearning.com/academy/learn-for-free/courses/introduction-to-cyber-security
Question Paper Scheme:	
University Examination Duration: 3 Hours	

Note for Examiner: -
(I) Questions 1 and 4 are compulsory with no options.
(II) Internal options should be given in questions 2, 3, 5 and 6.

SECTION – I

Q.1 –8 Marks
Q.2 –11 Marks
Q.3 –11 Marks

SECTION - II

Q.4 –8 Marks
Q.5 –11 Marks
Q.6 –11 Marks