COURSE MODULE OF THE SUBJECT TAUGHT FOR THE SESSION 2025-26 - (EVEN SEM)

Course Syllabi with CO's

Faculty Name: Mrs. Razikha Amreen M I			**Academic Year: 2025 - 2026**				
Department: Computer Science & Engineering – Cyber Security							
Course Code	**Course Title**	**Core / Elective**	**Prerequisite**	**Contact Hours**			**Total Hrs/ Sessions**
				L	**T**	**P**	
BCY402	ELEMENTS OF CYBER SECURITY	Core	Basics of Cyber Security	3	0	2	40T+20P
Course Objectives	1. To learn about concepts and different types of cyber crime and Mitigation 2. To have an overview of the cyber security for Mobile Devices, Digital Payments, Email, Web and Wireless networks 3. Introduction to basics of Cryptography 4. To study the defensive techniques against Cyber attacks						

Topics Covered as per Syllabus

MODULE-1

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Cyber, Threats-Cyber Warfare, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security

Module-2

Mobile and Digital Payments Security: Security Challenges and types of attacks on Mobile devices, Security for Mobile Apps, Mobile Device Management tools and techniques.

Digital payments Security: Banking Cards, Unified Payment Interface (UPI), e-Wallets, Unstructured Supplementary Service Data (USSD), Aadhar enabled payments, Digital payments related common frauds and preventive measures.

Note : Aadhar Enabled Payments topic as a case study not for the examination point of view.

Module-3

E-Mail Security: Pretty Good Privacy, S/MIME IP Security: IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, Combining security associations, Internet Key Exchange.

Module-4

Web security considerations, Secure Socket Layer and Transport Layer Security, HTTPS, Secure Shell (SSH).

Wireless Network Security: Wireless Security, Mobile Device Security, IEEE 802.11 Wireless LAN, IEEE 802.11i Wireless LAN Security

Module-5

Cryptography Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

Laboratory Component:

Sl.NO	Experiments
1	Install Kali Linux and explore basic Linux commands and tools.
2	Perform basic network scanning using the Nmap tool (Zenmap on Windows). Identify services, open ports, active hosts, operating systems, and vulnerabilities.
3	Phishing simulations (Google, LUCY and GoPhish).
4	Packet analysis using Wireshark.
5	Perform SQL injection using BurpSuite
6	Ransomware tabletop exercise on insider threat.
7	Crypt analysis of symmetric ciphers using Cryptool.
8	Crypt analysis of asymmetric ciphers using Cryptool.
9	Pwning machines (HackTheBox). - Demonstration

List of Textbooks

Text Books:

1.Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.

2.Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&F Group.

3.Cryptography and Network Security - Principles and Practice: William Stallings, Pearson Education .

Course Outcomes	1. Explain various types of cyber threats and attacks. 2. Simulate different types of cyber attacks using appropriate tools. 3. Explain security issues and attack scenarios related to digital payment systems. 4. Explain the concepts and mechanisms of email and web security. 5. Explain the basic concepts of cryptography. 6. Analyze symmetric and asymmetric cryptographic algorithms using CrypTool.

Internal Assessment Marks: 50 (CIE for theory component-25 Marks: 2 Tests, each of 15 marks and other assessments for 10 marks and CIE for Practical component-25 Marks: conduction of the experiment along with laboratory record for 15 Marks and test for 10 Marks).

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Name and Code	Elements Of Cyber Security- BCY402														
Faculty	Razikha Amreen M I														
List of Course Outcomes (RBT)	Program Outcomes													Program Specific	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Total	PSO1	PSO2
CO-1(L2)	2	1	1	1	-	-	-	-	-	1	-	-	6	-	-
CO-2(L2)	2	3	2	3	3	-	-	-	3	-	-	-	16	-	-
CO-3(L2)	2	1	2	1	-	3	3	3	-	3	1	-	16	-	-
CO-4(L2)	2	1	2	1	-	-	-	-	-	3	-	-	9	-	-
CO-5(L2)	2	1	-	-	-	-	-	-	-	-	-	2	5	-	-
Total	**10**	**7**	**7**	**6**	**3**	**3**	**3**	**-**	**3**	**7**	**1**	**2**	**52**	**-**	**-**
Ave. CO	**2.00**	**1.40**	**1.75**	**1.50**	**3.00**	**3.00**	**3.00**	**-**	**3.00**	**2.33**	**1.00**	**2.00**	**10.40**	**-**	**-**