CVM UNIVERSITY
Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: **Bachelor of Technology (Electrical Engineering)**

Semester: **V**

Course Code: **202040521**

Course Title: **Introduction to Cyber Security**

Course Group: **Open Elective**

Course Objectives: Cyber Security is an area of study that investigates the possibilities of safe internet activity and how to safeguard oneself and, eventually, society against such attacks. After completing the course, students should be able to: comprehend cyber-attacks, forms of cybercrimes, cyber laws, and how to defend themselves and, ultimately, society from such assaults.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
2	0	2	3	50/18	50/17	25 / 09	25/09	150/53

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Fundamentals of Computer Networks and Operating System.** Computer network principles, fundamental networking concepts, packet- switching and circuit switching, OSI model, TCP/IP protocol layers, reliable data transfer, congestion control, flow control, packet forwarding and routing. Basics of Operating Systems, Types of Operating Systems, OS Service, System Calls, OS structure: Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine.	6
2	**Introduction to Cyber** Introduction to Cyber Security, Importance and challenges in Cyber Security, Cyberspace, and Cyber threats, Cyber warfare, CIA Triad, Cyber Terrorism, Cyber Security of Critical Infrastructure, Cyber security -Organizational Implications.	5
3	**Hackers And Cyber Crimes** Types of Hackers, Hackers and Crackers, Cyber-Attacks and Vulnerabilities, Malware threats, Sniffing, Gaining Access, Escalating Privileges, Executing Applications, Hiding Files, Covering Tracks, Worms, Trojans , Viruses – Backdoors.	5

Opp. Shastri Maidan, Beside BVM College, Vallabh Vidyanagar, Dist: Anand, Gujarat - 388120
(O): 02692-238001 | Email: adminoffice@cvmu.edu.in | www.cvmu.edu.in

4	**Network Defense and Countermeasures** Network Reconnaissance – Nmap, Network Sniffers and Injection tools –Wireshark, Ettercap, Honeypots and Firewalls, Application Inspection tools – Zed Attack Proxy, Sqlmap.	**6**
5	**Introduction about Cyber Crime and Cyber Security** Classification of cybercrimes and its examples, The legal perspectives, Cybercrime and the Indian ITA 2000, Global Perspective on Cybercrimes.	**5**

List of Practicals / Tutorials:

1	Configure Basic Computer Network Topology.
2	Study of Basic commands of Linux/UNIX and working with shell script.
3	Introduction Virtualization Environment configuration and Cyber Lab setup (Kali, VM ware and Oracle VirtulBox).
4	Information Gathering using NMAP framework and study about port scanning.
5	Understand packet capturing tool wireshark or Ethercap and analysis of those packets.
6	Using open port information perform MITM(Man In The Middle) attack using arpspoof, urlsnarf, dsniff, dnsspoof. 1. Interruption 2. Interception
7	Understand the concept of firewall and configure the Statefull Packet Inspection(SPI) firewall IPTABLES.
8	Demonstrate automated SQL injection with SqLMap.
9	Demonstrate Application Injection using Zed Attack Proxy.
10	Case Study: Safe Internet Usage Policies for day to day life.

Reference Books:

1	Gray Hat Hacking The Ethical Hacker's Handbook, Fourth Edition.
2	Anti-Hacker Tool Kit (Indian Edition) by Mike Shema, Publication Mc Graw Hill.
3	Cyber Security- Understanding Cyber Crimes, Computer Forensics and Legal Perspective", by Nina Godbole, Sunit Belapure, Wiley Publication.
4	Operating System Concepts (8th Edition) by Silberschatz, Peter B. Galvin and Greg Gagne, Wiley Indian Edition (2010).
5	Computer Networking- A Top-Down approach, 5th edition, Kurose and Ross, Pearson.

Supplementary learning Material:	
1	NPTEL course / tutorials
2	Open online courses from www.coursera.org, www.udacity.com, etc.

Opp. Shastri Maidan, Beside BVM College, Vallabh Vidyanagar, Dist: Anand, Gujarat - 388120
(O): 02692-238001 | Email: adminoffice@cvmu.edu.in | www.cvmu.edu.in

Pedagogy:

- Direct classroom teaching
- Assignments/Quiz
- Continuous assessment
- Seminar/Poster Presentation
- Course Projects

Internal Evaluation:

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Case study, Seminar, Poster Presentation, Unit test, Quiz, Class Participation etc. where individual component weightage should not exceed 20%.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
25%	20%	20%	15%	20%	0%	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Students will be able to understand computer network and operating system fundamentals.	**15**
CO-2	Students will be able to explore various types of cyber-attacks.	**15**
CO-3	Understand basic concept of cyber security and vulnerabilities.	**25**
CO-4	Able to analyze and evaluate vulnerabilities assessment tools and penetration testing.	**25**
CO-5	Students will be able to acquire knowledge of types of cybercrimes, cyber laws and how to protect themselves.	**20**

Curriculum Revision:	
Version:	2.0
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	-
Next Review on (Month-Year):	June-2025

Opp. Shastri Maidan, Beside BVM College, Vallabh Vidyanagar, Dist: Anand, Gujarat - 388120
(O): 02692-238001 | Email: adminoffice@cvmu.edu.in | www.cvmu.edu.in