GUJARAT TECHNOLOGICAL UNIVERSITY

BACHELOR OF ENGINEERING SYLLABUS

Subject Code : 3164207

Subject Name : Cybercrime and Mitigation

WEF Academic Year :	2020-21
Semester :	6
Category of the Course :	Open Elective - I

Prerequisite :

- Basic fundamental knowledge of computers, Internet, and network.
- Basics knowledge of Artificial Intelligence and Machine Learning.

Rationale :

- The course will focus upon fundamentals of various cybercrime and mitigation.
- The course will focus upon the learning of various AI based applications to mitigate cybercrime.

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	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	**Introduction to Cyber Crime and law** Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of Terms, Traditional Problems Associated with Computer Crime, Introduction to Incident Response, Digital Forensics, Computer Language, Network Language, Realms of the Cyber world, A Brief History of the Internet, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000.	08	20
2	**Classification of cyber crimes** Taxonomy of Cybercrime, Classification of cybercrimes, Cyber crimes against persons, Crimes against person's property, Cybercrimes against Government, Cybercrimes against Society at large, Causes of Cybercrime, Impact and effects of cybercrimes, Various Cybercrimes case studies.	08	20

3	**Systems Vulnerability Scanning** OWASP Top 10 Vulnerabilities, Overview of vulnerability scanning, Open Port / Service Identification, Banner /Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit. Networks Vulnerability Scanning - Netcat, Socat, understanding Port and Services tools - Datapipe, Fpipe, WinRelay, Network Reconnaissance – Nmap, THC-Amap and System tools. Network Sniffers and Injection tools – Tcpdump and Windump, Wireshark, Ettercap, Hping Kismet	08	20
4	**Network Defense tools** Firewalls and Packet Filters: Firewall Basics, Packet Filter Vs Firewall, Network protection through firewall, Packet Characteristic to Filter, Stateless Vs. Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall, Snort: Introduction Detection System	08	20
5	**Machine Learning for Cybercrime and Mitigation** A deep-dive on Machine Learning for Cyber Security Use Cases, Deep learning-based system for network cyber threat detection, Machine learning for phishing detection and mitigation, A Taxonomy of Bitcoin Security Issues and Defense Mechanisms.	08	20

Reference Books :

1. Anti-Hacker Tool Kit (Indian Edition) by Mike Shema, Publication Mc Graw Hill.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Nina Godbole and Sunit Belpure, Publication Wiley
3. Cyber Crime Law and Practice by the institutes of Company Secretaries of India, 2016.
4. Machine Learning for Computer and Cyber Security – Principles, Algorithms and Practices by Brij Gupta, Michael Sheng, Publication CRC Press, Taylor & Francis Group, 2019.

Course Outcome :

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

No	Course Outcomes	RBT Level*
01	Understand the concept of the cybercrime and law.	UN
02	Understand the classification of cybercrimes.	UN
03	Execute techniques and concepts for system vulnerability scanning using various tools.	AP

04	Apply various network defense tools for threat detection.	AP
05	Apply various machine learning concepts for cybercrime mitigation.	AP

*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.

List of Laboratory/Learning Resources Required :

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

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