GUJARAT TECHNOLOGICAL UNIVERSITY
BRANCH: CYBER SECURITY (59)
SUBJECT NAME: Ethical Hacking
SUBJECT CODE: 2725903
Semester II

Type of course: Master of Engineering

Prerequisite: Computer Networking, Cryptography

Rationale: The security of digital infrastructure is an utmost need for an organization. The variety of security attacks makes it compulsion to analyse the way newer attacks are formed and their understanding is important to prevent or detect such attacks. The ethical hacking covers the theory and practices of finding the vulnerabilities through forming the different attacks and then defining the appropriate security policy including the action to detect or prevent the attacks and thus reduce the damages.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks		Practical Marks				
				ESE (E)	PA (M)	PA (V)		PA(I)		
							ESE	PA	RP	
4	0	2	5	70	30	20	10	10	10	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment.

Content:

Sr. No.	Topic	Total HRS	% Weightage
1	**An Introduction to ethical Hacking :** Security Fundamental, Security testing, Hacker and Cracker, Descriptions, Test Plans-keeping It legal, Ethical and Legality	3	5%
2	**The Technical Foundations of Hacking:** The Attacker's Process, The Ethical Hacker's Process, Security and the Stack	5	10%
3	**Footprinting and scanning :** Information Gathering, Determining the Network Range, Identifying Active Machines, Finding Open Ports and Access Points, OS Fingerprinting Services, Mapping the Network Attack Surface	5	10%
4	**Enumeration and System Hacking :** Enumeration, System Hacking,	5	10%
5	**Malware Threats :** Viruses and Worms, Trojans, Covert Communication, Keystroke Logging and Spyware, Malware Counter measures	5	10%
6	**Sniffers, Session Hijacking and Denial of Service :** Sniffers, Session Hijacking, Denial of Service and Distributed	5	10%

	Denial of Service		
7	**Web Server Hacking, Web Applications and Database Attacks:** Web Server Hacking, Web Application Hacking, Database Hacking	5	10%
8	**Wireless Technologies, Mobile Security and Attacks :** Wireless Technologies, Mobile Device Operation and Security, Wireless LANs	5	10%
9	**IDS, Firewalls and Honeypots :** Intrusion Detection Systems, Firewalls, Honeypots	5	10%
10	**Physical Security and Social Engineering:** Physical Security, Social Engineering	5	10%
11	**Cloud Computing and Botnets:** Cloud Computing, Botnets	4	5%

Reference Books:

1. Certified Ethical Hacker, Version 9, Second Edition, Michael Gregg, Pearson IT Certification
2. Hacking the Hacker, Roger Grimes, Wiley
3. The Unofficial Guide to Ethical Hacking, Ankit Fadia, Premier Press

Course Outcome:

After learning the course the students should be able to:.

- Describe and understand the basics of the ethical hacking
- Perform the foot printing and scanning
- Demonstrate the techniques for system hacking
- Characterize the malware and their attacks and detect and prevent them
- Determine the signature of different attacks and prevent them
- Detect and prevent the security attacks in different environments

List of Experiments:

1. List the tools for Ethical Hacking.
2. Implement Footprinting and Reconnaissance using tools 3d Traceroute, Alchemy Eye, DNS Tools and Network Solution Whois.
3. Implement Network Scanning using tools Advanced Port Scanner, Colasoft Ping Tool, Hide Your IP Address, Nessus and Nmap.
4. Implement Enumeration using tools Default Password List, Default Password List, OpUtil Network Monitoring Tool and OpUtil Network Monitoring Tool.
5. Implement system hacking using tools Actual spy, Alchemy Remote Executor, Armor Tool and F-Secure BlackLight.
6. Implement Trojan and Backdoors using tools Absolute Startup Manager, Absolute Startup Manager, Netwirx Services Monitor and StartEd Lite.
7. Implement Viruses and Worms using tools Anubis Analyzing UnknownBinaries, Filterbit, Sunbelt CWSandbox and ThreatExpert.

8. Implement sniffers using tools Colasoft Capsa Network Analyzer, EffeTech HTTP Sniffer, Packet Sniffer and PRTG Network Monitor.
9. Write a research paper in which Ethical Hacking tools are used to address any problem definition in cyber security.

Major Equipments:

- Latest PCs with related software

List of Open Source Software/learning website:

- https://hackaday.com/
- https://breakthesecurity.cysecurity.org/
- https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/
- https://www.hackthissite.org/