

Course Title: Ethical Hacking and Cybersecurity

Course Duration: 30 hours

Faculty: Dr. Manish Dube and Gagan Sir

This course is designed to provide participants with the knowledge and skills necessary to conduct ethical hacking activities responsibly and ethically. Participants will gain practical experience through hands-on exercises and simulations using industry-standard tools and techniques.

Module 1: Introduction to Ethical Hacking (2 hours)

- Overview of ethical hacking and its importance in cybersecurity
- Distinction between ethical hacking and malicious hacking
- Scope and objectives of ethical hacking
- Legal and ethical considerations in ethical hacking

Module 2: Information Gathering and Reconnaissance (2 hours)

- Passive and active information gathering techniques
- Footprinting: gathering information about target systems
- Enumeration: identifying live hosts, open ports, and services
- Using reconnaissance tools: Nmap, Maltego, Recon-ng, etc.

Module 3: Scanning and Vulnerability Assessment (2 hours)

- Port scanning techniques: TCP, UDP, SYN, ACK scans
- Vulnerability scanning tools: Nessus, OpenVAS, Nikto, etc.
- Identifying vulnerabilities in target systems
- Reporting and prioritizing vulnerabilities

Module 4: Exploitation and Post-Exploitation (4 hours)

- Introduction to penetration testing
- Exploiting vulnerabilities to gain unauthorized access
- Privilege escalation techniques
- Maintaining access and covering tracks

Module 5: Web Application Security (4 hours)

- Common web application vulnerabilities: SQL injection, XSS, CSRF, etc. ● Testing web applications for security vulnerabilities
- Web application penetration testing methodology
- Secure coding practices and mitigation techniques

Module 6: Wireless Network Security (4 hours)

- Overview of wireless network security threats
- Wi-Fi security protocols: WEP, WPA, WPA2
- Wireless penetration testing: sniffing, spoofing, cracking
- Securing wireless networks and mitigating risks

Module 7: Cryptography and Cryptanalysis (4 hours)

- Fundamentals of cryptography: encryption, decryption, hashing ● Types of cryptographic algorithms: symmetric, asymmetric, hashing algorithms ● Cryptanalysis techniques: brute force, frequency analysis, etc. ● Using cryptographic tools for data protection

Module 8: Social Engineering and Physical Security (2 hours)

- Understanding social engineering attacks: phishing, pretexting, baiting, etc. ● Psychological principles behind social engineering
- Mitigating social engineering attacks through awareness and training ● Importance of physical security in cybersecurity

Module 9: Incident Response and Forensics (2 hours)

- Developing an incident response plan

- Steps in incident response: detection, containment, eradication, recovery • Digital forensics techniques and tools
- Collecting and preserving evidence for forensic analysis

Module 10: Legal and Ethical Considerations (2 hours)

- Laws and regulations related to ethical hacking
- Ethical guidelines and professional standards
- Reporting vulnerabilities responsibly
- Role of ethical hackers in promoting cybersecurity awareness

Assessment:

- Quizzes and assignments after each module
- Hands-on labs and exercises simulating real-world scenarios • Final project: Conducting a penetration test and preparing a comprehensive report.

Schedule For Ethical Hacking and Cybersecurity

Date	Day	Time	Topic
01/08/2024	Thursday	3pm to 5pm	Introduction to Ethical Hacking
06/08/2024	Tuesday	3pm to 5pm	Information Gathering and Reconnaissance
08/08/2024	Thursday	3pm to 5pm	Scanning and Vulnerability Assessment
13/08/2024	Tuesday	3pm to 5pm	Exploitation and Post-Exploitation
15/08/2024	Thursday	3pm to 5pm	Exploitation and Post-Exploitation
20/08/2024	Tuesday	3pm to 5pm	Web Application Security
22/08/2024	Thursday	3pm to 5pm	Web Application Security
27/08/2024	Tuesday	3pm to 5pm	Wireless Network Security
29/08/2024	Thursday	3pm to 5pm	Wireless Network Security
03/09/2024	Tuesday	3pm to 5pm	Cryptography and Cryptanalysis
05/09/2024	Thursday	3pm to 5pm	Cryptography and Cryptanalysis



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10/09/2024	Tuesday	3pm to 5pm	Social Engineering and Physical Security
12/09/2024	Thursday	3pm to 5pm	Incident Response and Forensics
17/09/2024	Tuesday	3pm to 5pm	Legal and Ethical Considerations
19/09/2024	Thursday	3pm to 5pm	Assessment