



Cyber Security Ethical Hacking Curriculum



1st Year – Training

Basic Level Topics:-

1..Introduction to Cybersecurity

- Definition, importance, and types of cybersecurity threats.
- Cybersecurity vs. Information Security.

2. Understanding Networks

- Basic networking concepts (IP addresses, DNS, routing).
- OSI Model and TCP/IP Model.
- Common network protocols (HTTP, HTTPS, FTP, SSH).

3. Cyber Threats and Attacks

- Types of cyber attacks (phishing, malware, ransomware, DDoS, man-in-the-middle).
- Social engineering techniques.
- Common vulnerabilities and exposures (CVEs).

4. Fundamentals of Cryptography

- Symmetric vs. asymmetric encryption.
- Hashing, digital signatures, and certificates.
- Basics of SSL/TLS.

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5. Security Policies and Best Practices

- Strong passwords and multi-factor authentication (MFA).
- Safe browsing practices.
- Regular software updates and patch management.

6. Introduction to Firewalls and Antivirus

- What is a firewall? Types of firewalls (hardware vs. software).
- Role of antivirus software.

Intermediate Level Topics:-

1. Advanced Networking Concepts

- Deep dive into TCP/IP.
- Network segmentation and subnetting.
- Virtual Private Networks (VPNs) and their importance

2. Web Application Security

- OWASP Top 10 vulnerabilities.
- Cross-Site Scripting (XSS), SQL Injection, Cross-Site Request Forgery (CSRF).
- Secure coding practices.

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3. Intrusion Detection and Prevention Systems (IDPS)

- What are IDS and IPS? Types and working mechanisms.
- Network vs. host-based systems.
- Incident detection and response strategies.

4. Access Control and Authentication

- Role-based access control (RBAC) vs. discretionary access control (DAC).
- Authentication methods (biometrics, tokens, smart cards). Identity and access management (IAM) tools.

5. Incident Response and Forensics

- Steps in incident response (preparation, detection, containment, eradication, recovery).
- Basics of digital forensics (data acquisition, analysis, and reporting).
- Chain of custody and legal considerations

6. Introduction to Penetration Testing

- Ethical hacking concepts.
- Penetration testing methodologies.

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- Tools like Nmap, Metasploit, Wireshark.

Advanced Level Topics:-

1..Advanced Cryptography

- Elliptic curve cryptography (ECC).
- Public Key Infrastructure (PKI).
- Quantum cryptography and its implications.

2. Threat Intelligence and Advanced Persistent Threats

- Understanding APTs and their lifecycle.
- Threat intelligence platforms and feeds.
- Advanced attack vectors and evasion techniques.

3. Security Information and Event Management (SIEM)

- SIEM architecture and components.
- Log management and correlation.
- Real-time monitoring and alerting.

4. Cloud Security

- Shared responsibility model in cloud environments.
- Securing cloud infrastructure (IaaS, PaaS, SaaS).

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- Identity and access management in the cloud.

5. Advanced Penetration Testing

- Exploit development.
- Buffer overflow attacks.
- Advanced network and web application testing techniques.

6. Cybersecurity Frameworks and Standards

- NIST Cybersecurity Framework.
- SO/IEC 27001.
- Compliance and regulatory requirements (GDPR, HIPAA, PCI-DSS).

7. Red Teaming and Blue Teaming

- Differences between red team and blue team exercises.
- Simulated attacks and defense strategies.
- Continuous monitoring and improvement.

2nd Year – Project

Basic to Intermediate Level Projects :-

1. Scanning using OWASP ZAP
2. Scanning for Open ports and attacking them
3. Information Gathering Tool



3rd Year – Internship

Advance Level training & project based internship :-

Task: - **Understanding and Defending Against Password**

- Attacks Password attacks remain a persistent threat to digital security. Hackers continuously develop new techniques to exploit weak passwords. This project will explore common password attack methods and implement strategies to defend against them.



4th Year – Placement

Placement training & automated resume

- Automated Resume
- Technical Training
- Mock Exams
- Mock Interviews
- Interview Tips
- PPO

