Ethical Hacking & Information Security

Ethical Hacking and Information Security
4 Weeks Online Course

4 Weeks. (3 Hrs. per day)
Timing: - 2:00 PM to 05:00 PM
Medium of Instruction: Bilingual (English& Hindi)

Objective

This course introduces the concepts of Ethical Hacking and gives the learner the opportunity to learn about different tools and techniques in Ethical hacking and security. Identify and analyze the stages an ethical hacker requires to take in order to compromise a target system as well as will apply preventive, corrective and protective measures to safeguard the system. After the completion of this course candidate would be able to Identify tools and techniques to carry out a penetration testing and critically evaluate security techniques used to protect system and user data and it will also help to demonstrate systematic understanding of the concepts of security at the level of policy and strategy in a computer system.

Eligibility

B.E*/B.Tech.* / B.Sc. - M.Sc. / Graduate / Diploma in any stream with Basic Knowledge of Programming or B.C.A*. / M.C.A. pursuing or qualified or NIELIT O-Level / NIELIT A-Level Qualified or 10+2 qualified with knowledge of programming. **(Note: *pursuing candidate can also apply)**

Prerequisites

✓ Candidate must have latest computer/laptop with preferably 4 GB RAM or higher and Graphics Card (2 GB)
✓ Internet connection with good speed *(preferably 2 Mbps or higher).*

Course Fees

Rs. 3100/- incl. GST & all other charges.

Certificate

Certificate will be provided to the participants, based on minimum 75% attendance and on performance (minimum 50% marks) in the online test, conducted at the end of the course.

Methodology

✓ Instructor-led live classes.
✓ Instructor-led hands-on lab sessions using **Virtual Lab**.
✓ Content Access through e-Learning portal.
✓ Assessment and Certification

How to Apply

Step-1: Read the course structure & course requirements carefully.

Step-2: Visit the Registration portal and click on apply button.

Step-3: Create your login credentials and fill up all the details, see the preview and submit the form.

Step-4: Login with your credentials to verify the mobile number, email ID and then upload the documents, Lock the profile and Pay the Fees online, using ATM-Debit Card / Credit Card / Internet Banking / UPI etc.

Course Content

Day	Topic	Day	Topic	Day	Topic
Day #01	NETWORK PRIMER -I	Day #02	NETWORK PRIMER –II	Day #03	NETWORK PRIMER –III
Day #04	INFORMATION GATHERING	Day #05	SNIFFING, ARP CACHE POISONING & MITM ATTACKS.	Day #06	PASSWORD CRACKING
Day #07	IP SPOOFING & DENIAL OF SERVICE	Day #08	TROJAN, BACKDOOR AND VIRUS	Day #09	STEGANOGRAPHY-I
Day #10	STEGANOGRAPHY-II	Day #11	E-MAIL SECURITY	Day #12	SECURING E-MAIL COMMUNICATION
Day #13	WEB APPLICATION SECURITY –I	Day #14	WEB APPLICATION SECURITY –II	Day #15	WEB APPLICATION SECURITY -III
Day #16	NETWORK TRAFFIC ENCRYPTION	Day #17	INDRUSION DETECTION SYSTEM	Day #18	NETWORK SECURITY-I
Day #19	NETWORK SECURITY-II	Day #20	PENETRATION TESTING USING METASPLOIT		

Course Coordinator

Sh. Abhinav Mishra (Scientist D),
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Course Contents

Day	Detailed Conceptual Topic	Hands On lab
Day1	**NETWORK PRIMER -I** What is Networking, Benefits of Network, Basic Components needed for Network Communication, Client/Server Model, Types of Servers, Role of A Network Administrator, Network segmentation, LAN traffic congestion Ethernet, CSMA/CD, Internetworking Basics, Broadcast domain, Collision Domain Hub, Switch & Router , Repeaters, Ethernet Cabling: - Straight-Through Cable, Crossover Cable, Rolled Cable, Internet Protocols: - TCP/IP Model, OSI Reference Model, Port Numbers,TCP/IP, TCP/UDP, MAC Address, IP Addressing, IP Terminology, IP Addressing Scheme	Study of Ethernet Cabling: - Straight-Through Cable, Crossover Cable, Rolled Cable
Day2	**NETWORK PRIMER -II** Sub netting Basics, How to Create Subnets, Subnet Masks, Classless Inter-Domain Routing (CIDR), Sub netting Class C Addresses, Sub netting Class B Addresses, Physical Vs Logical Address, Public & Private IP Addresses	Practice on IP Subnetting on CLASS A,B & C networks.
Day3	**NETWORK PRIMER –III** TCP/IP Troubleshooting utilities, Troubleshooting IP Addressing, hostname, Arp, Ping, tracert / traceroute, Netstat, getmac, Nslookup. IANA, IANA Root Zone Database, IANA Number Resources, local Internet registry (LIR),National Internet Registry (NIR), AfriNIC, APNIC, ARIN, LACNIC, RIPE NCC, Regional Internet Registry (RIR),Internet, Who Controls the Internet?, Network Registrar for .EDU.IN, .RES.IN, .AC.IN, .GOV.IN in INDIA, List of Root Servers, Applications of Internet, ERNET, National Informatics Centre (NIC).	Hands-on lab on Whois Domain Lookup,Whois IP lookup,Nslookup ,Nmap Scanning TCP/IP Utilities, hostname, Arp, Ping, tracert / traceroute, Netstat, Getmac, Nslookup
Day4	**INFORMATION GATHERING** Introduction to Information Security, CIA Triad, Services & Techniques, Actives and Passive Threats and Exploit, etc. Introduction to Information Gathering, Phases of Information Gathering, Registration details of the website, contact details. Finding out the target IP address, Finding out DNS record , sub domains, Operating system, Finding login pages, Finding out sensitive, directory, Find out any known vulnerability Network Scanning, Network Scanning Techniques and Scanning counter measures.	Hands-on lab on Information Gathering and its countermeasures
Day5	**SNIFFING, ARP CACHE POISONING & MITM ATTACKS.** Sniffing, ARP Cache Poisoning, Man in the Middle (MITM) Attacks,	Hands on Lab on Trojan Virus & its Countermeasures
Day6	**PASSWORD CRACKING** Password Hashes, Password Cracking types, Dictionary Attack, Brute Force Attacks, Cracking Passwords using John the Ripper, Other password Cracking tools, How passwords are stored in Linux /etc/passwd and /etc/shadow,How passwords are stored in Windows,Testing SSH Password and Hardening of SSH,Password Cracking Countermeasures	Hands on lab on Password cracking techniques and its countermeasures
Day7	**IP SPOOFING & DENIAL OF SERVICE** IP Spoofing, Denial of Service (DoS), TCP SYN Flood Attack using hping3,Detecting TCP Syn Flood attacks using Wireshark, Detecting TCP Syn Flood attacks using netstat,Suggesting & Implementing Countermeasures	Hands on lab on IP Spoofing , Denial of Service (DoS) and its countermeasures
Day8	**TROJAN ,BACKDOOR AND VIRUS** Introduction to Virus, What is Trojan?, Types Of Trojans, Different way a Trojan Can Get Into A System, Trojan, Backdoor, What is Keylogger, Categorization of Keystroke Loggers& Virus & Countermeasures,	Hands on lab on Trojan ,Backdoor and its countermeasures
Day9	**STEGANOGRAPHY-I** Information Hiding, Techniques Steganography, Steganography with CMD, Steganography using image file Steghide tool, Scapy tool used for Steganography	Hands on lab on Steganography CMD and using image file

Day10	**STEGANOGRAPHY-II** ICMP, Steganography using ICMP Payload Scapy tool used for Steganography	Hands on lab on Steganography using ICMP Payload
Day11	**E-MAIL SPOOFING and PHISHING** Concept of Email,SMTP,POP3 and IMAP,Email Spoofing,Types of Phishing, E-mail Phishing, E-Mail Tracking by Header, Concept of Fake E-mails, Protections, SPF,DKIM and DMARC Records, Using nslookup to check SPF/DKIM/DMARC records Concept of Fake E-mails	Hands on lab on demonstration on phishing mail and its countermeasures.
Day12	**SECURING E-MAIL COMMUNICATION** PGP, E-mail Security, Securing E-Mail Communication, PGP,MIME,S/MIME, Difference between PGP and S/MIME, Scenario For E-mail Security	Hands on lab on Securing E-Mail communications using PGP
Day13	**WEB APPLICATION SECURITY -I** Web Application Concepts, Different Types of Web Applications Attacks and Threats, Hacking Methodology, Web Application Hacking Tools, Firewall,WafW00fWeb Application Vulnerabilities & Countermeasures	Hands on lab on Web Application Security and its Countermeasures
Day14	**WEB APPLICATION SECURITY -II** Apache Web Server Concepts, Web Server Attacks, Web Server Attacks Methodology, Web Server Attack Tools, Countermeasures, Patch Management, Web Server Security Tools, Web Server Pen Testing Countermeasures, Web Application Security Testing Tools, Vulnerability Scanning, Acunetix & W3af,Nikto,WAF Testing, WAF	Hands on lab on Web Application Security and its Countermeasures.
Day15	**WEB APPLICATION SECURITY -III** Brute Force Attack in Web Application Command Injection in Web Application SQL Injection in Web Application XSS Reflected in Web Application XSS Store in Web Application	Hands on lab on Web Application Security and its Countermeasures.
Day16	**NETWORK TRAFFIC ENCRYPTION** IP Security, Protocols used in IPSec, Security Architecture of IPSec and Modes of IPSec , VPN, Types of VPN,IP Security, Protocols used in IPSec, SSH Port Forwarding	Hands-on lab on configuring IP Security between 02 Hosts
Day17	**INDTRUSION DETECTION SYSTEM** Introduction to IDS, Types of IDS, Introduction to IDS, ,Architecture of Snort,Logical components of snort, Placement of Snort, Component used in Snort ,Implementation Functions of IDS,Rules in snort Tools Of Intrusion Detection, Rule Actions and Protocols,Detection	Hands-on lab on Installing and configuring IDS.
Day18	**NETWORK SECURITY-I** Introduction to Network Security ,Introduction to MAC address,Introduction to CAM Table,CAM Flooding Attacks ,Introduction to Macof tool,MAC-Port Binding Types,Switch Port Violations,Switch Port Security, Preventing CAM Flooding Attacks by using Switch Port Security	Hands-on lab on preventing CAM Flooding Attacks by using Switch Port Security,
Day19	**NETWORK SECURITY-II** Securing DHCP,DHCP Snooping, Preventing unauthorized access to DHCP Server by using DHCP Snooping, MAC Spoofing, IP Source Binding, Preventing MAC Spoofing by using IP Source Binding,Port Mirroring	Hands-on lab on Preventing unauthorized access to DHCP Server by using DHCP Snooping, and IP Source Binding,
Day20	**PENETRATION TESTING USING METASPLOIT** Introduction to Penetration Testing, Penetration testing methodology, Types of penetration testing, Pen Testing	Hands-on lab on Penetration Testing using Metasploit

Techniques, Penetration Testing Tools, Examples of Free and Commercial Tools, Limitations of Pentest tools. Introduction to Penetration Testing, Penetration testing methodology, Types of penetration testing, Pen Testing Techniques, Penetration Testing Tools, Examples of Free and Commercial Tools, Limitations of Pentest tools. Metasploit GUIs,MSF Community Edition, Armitage Binary Payloads, Client Side Exploits, Social Engineering Toolkit, Client side Attack and Privilege Escalation with Meterpreter using Social Engineer Toolkit	

National Institute of Electronics & Information Technology
Gorakhpur – Extension Centre Lucknow
(Under Ministry of Electronics and Information Technology, Govt. of India)

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	Ethical Hacking ans Information Security			
Day	Topics to be covered.			
	Theory (2:00 PM -3:00 PM)		Practical(3:00 PM -5:00 PM)	
	Content	Name of Instructor	Content	Name of Instructor
Day1	NETWORK PRIMER -I	Abhinav Mishra	Study of Ethernet Cabling: - Straight-Through Cable, Crossover Cable, Rolled Cable	Abhinav Mishra
Day2	NETWORK PRIMER -II	Abhinav Mishra	Practice on IP Subnetting on CLASS A,B & C networks.	Abhinav Mishra
Day3	NETWORK PRIMER –III	Abhinav Mishra	Hands-on lab on Whois Domain Lookup,Whois IP lookup,Nslookup ,Nmap Scanning TCP/IP Utilities, hostname, Arp, Ping, tracert / traceroute, Netstat, Getmac, Nslookup	Abhinav Mishra
Day4	INFORMATION GATHERING	Abhinav Mishra	Hands-on lab on Information Gathering and its countermeasures	Shweta Verma
Day5	SNIFFING, ARP CACHE POISONING & MITM ATTACKS.	Abhinav Mishra	Hands On Lab On Sniffing, ARP Cache Poisoning & MITM Attacks & Its Countermeasures	Shweta Verma
Day6	PASSWORD CRACKING	Shweta Verma	Hands on lab on Password cracking techniques and its countermeasures	Shweta Verma
Day7	IP SPOOFING & DENIAL OF SERVICE	Abhinav Mishra	Hands on lab on IP Spoofing , Denial of Service (DoS) and its countermeasures	Shweta Verma
Day8	TROJAN ,BACKDOOR AND VIRUS	Abhinav Mishra	Hands on lab on Trojan ,Backdoor and its countermeasures	Shweta Verma
Day9	STEGANOGRAPHY-I	Shweta Verma	Hands on lab on Steganography CMD and using image file	Shweta Verma
Day10	STEGANOGRAPHY-II	Shweta Verma	Hands on lab on Steganography using ICMP Payload	Shweta Verma
Day11	E-MAIL SPOOFING ,PHISHING	Abhinav Mishra	Hands on lab on demonstration on phishing mail and its countermeasures.	Shweta Verma
Day12	SECURING E-MAIL COMMUNICATION	Abhinav Mishra	Hands on lab on Securing E-Mail communications using PGP	Shweta Verma
Day13	WEB APPLICATION SECURITY -I	Sandeep Pati Tripathi	Hands on lab on Web Application Security and its Countermeasures	Sandeep Pati Tripathi
Day14	WEB APPLICATION SECURITY -II	Sandeep Pati Tripathi	Hands on lab on Web Application Security and its Countermeasures.	Sandeep Pati Tripathi
Day15	WEB APPLICATION SECURITY -III	Sandeep Pati Tripathi	Hands on lab on Web Application Security and its Countermeasures.	Sandeep Pati Tripathi
Day16	NETWORK TRAFFIC ENCRYPTION	Abhinav Mishra	Hands-on lab on configuring IP Security between 02 Hosts	Shweta Verma
Day17	INTRUSION DETECTION SYSTEM	Abhinav Mishra	Hands-on lab on Installing and configuring IDS.	Shweta Verma
Day18	NETWORK SECURITY-I	Abhinav Mishra	Hands-on lab on preventing CAM Flooding Attacks by using Switch Port Security,	Shweta Verma
Day19	NETWORK SECURITY-II	Abhinav Mishra	Hands-on lab on Preventing unauthorized access to DHCP Server by using DHCP Snooping, and IP Source Binding,	Shweta Verma

Day20	PENETRATION TESTING USING METASPLOIT	Shweta Verma	Hands-on lab on Penetration Testing Using Metasploit	Shweta Verma