06 Weeks

Enterprise Network Administration and Cyber Security

- Week 1: Network Primer, Virtualization Primer
- Week 2: Routing and Switching
- Week 3: Network Administration using Windows Server
- Week 4: Network Administration using Linux
- Week 5: Cyber Security & Ethical Hacking
- Week 6: Digital Forensics and Cyber Law

National Institute of Electronics and Information Technology (NIELIT), Gorakhpur

About NIELIT

- National Institute of Electronics & Information Technology (NIELIT),(erstwhile DOEACC Society), an Autonomous Scientific establishment under the administrative control of the Ministry of Electronics & Information Technology (MoE&IT), Government of India, was set up to carry out Human Resource Development and related activities in the area of Information, Electronics & Communications Technology (IECT).
- NIELIT Head quarter is at New Delhi.
- NIELIT is engaged both in Formal & Non-Formal Education in the area of IECT besides the development of industry-orientated quality education and training programs in the state-of-the-art areas.
- NIELIT has endeavored to establish standards to be the country's premier institution for Examination and Certification in the field of IECT.
- It is also one of the National Examination Body, which accredits institutes/organizations for conducting courses in IT in the non-formal sector.
- As on date, NIELIT has forty-seven (47) centers located at Agartala, Aizawl, Ajmer, Alawalpur (Saksharta Kendra), Aurangabad, Bhubaneswar, Calicut, Chandigarh, Chennai, Chuchuyimlang, Churachandpur, Daman, Delhi, Dibrugarh, Dimapur, Gangtok, Gorakhpur, Guwahati, Haridwar, Imphal, Itanagar, Jammu, Jorhat, Kargil, Kohima, Kolkata, Kokrajhar, Kurukshetra, Lakhanpur (Saksharta Kendra), Leh, Lucknow, Lunglei, Majuli, Mandi, Pasighat, Patna, Pali, Ranchi, Ropar, Senapati, Shillong, Shimla, Silchar, Srinagar, Tezpur, Tura and Tezu with its Headquarters at New Delhi.
- It is also well networked throughout India with the presence of about 700 + institutes.
- Over the last two decades, NIELIT has acquired very good expertise in IT training, through its wide repertoire of causes, ranging from 'O' Level (Foundation), 'A-Level (Advance Diploma), 'B' Level (MCA equivalent), 'C' Level (M-Tech level), IT literacy courses such as CCC (Course on Computer Concept), BCC (Basic Computer Course) and other such long term and short term course in the non-formal sector like courses on Information Security, ITeS-BPO(Customer Care/Banking), Computer Hardware Maintenance (CHM-O/A level), Bio-Informatics(BI-O/A/B level), ESDM etc, besides, high end courses offered by NIELIT Centres at Post-Graduate level (M.Tech) in Electronics Design & Technology, Embedded Systems etc. which are not normally offered by Universities/Institutions in the formal sector, in association with the respective state Universities.
- The basket of activities of NIELIT is further augmented by the wide range of projects that it undertakes. NIELIT has demonstrated its capability and capacity to undertake R&D projects, consultancy services, turnkey projects in office automation, software development, website development etc.

About NIELIT Gorakhpur

- NIELIT, Gorakhpur Centre was established as the Centre for Electronics Design & Technology of India (CEDTI) in June 1989. It is an Autonomous Scientific establishment under the administrative control of the Ministry of Electronics and Information Technology, Govt. of India.
- It caters to the training, Consultancy, Design, and Product Development needs of small-scale IT Industries and allied sectors. It also conducts training programs for the promotion of Entrepreneurs.
- The center has a total covered area of 3450 sq. Mtrs and hostel building for 70 students.
- NIELIT Gorakhpur has been granted affiliation by Dr. A.P.J. Abdul Kalam University, Lucknow formerly UPTU Lucknow, to conduct the two M.Tech. Courses. M.Tech. in Electronics Design & Technology and M.Tech. in VLSI Design.
- It is also an accredited center for 'O' and 'A' level Software Courses,'O' and 'A' level in Bio-Informatics, and for 'O' and 'A' level Hardware Courses.
- NIELIT Gorakhpur is a Premier institution for Education, Training, Research & Design, and Consultancy in IT and Electronics. It conducts courses for, Embedded Systems, VLSI, Instrumentation, BioInformatics, ITES-BPO, Information Security, Cyber Law, Networking, and other areas of Information Technology.

Enterprise Network Administration and Cyber Security

Objective : This is an intensive, practical "hands-on" training where participants would gain an overview on Networking using Windows Server and Linux OS. In this course, the candidate will also learn about Cyber Security and Digital Forensics. This course will teach how to implement and manage Windows Server and Linux system in an IT infrastructure and securing the services in Windows/Linux based operating system. The technical contents of this course gives a broad overview of essential concepts and methods for providing and evaluating security in Windows & Linux based system along with the knowledge of Cyber Law and Digital Forensics.
This training also tests a candidate's knowledge and skills required installing, operating, and troubleshooting a small to medium size enterprise branch network

Eligibility : 10+2 with working knowledge of computer.

Duration & Timing : The duration of the training will be 06 Weeks / 30 days/ Total 90 Hrs, Monday to Friday (10:00 AM - 12:30 PM)

Batch Size: The batch size will be of 20 participants

Training Fee : Rs 4500.00 **(Including GST @18%) - for Online Mode**
Rs 6,750.00 **(Including GST @18%) - for In-Campus Mode**

Salient Features:

- ✓ Instructor-led live classes.
- ✓ Instructor-led hands-on lab sessions
- ✓ Interactive Quiz
- ✓ Course Materials
- ✓ Certification

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Course Outline

Week 1		
Network and Virtualization Primer		
Unit	**Detailed Conceptual Topic**	**Hands On lab**
Unit 1	**Network Primer -I** What is Networking, Benefits of Network, Components Of Computer Network, Client/Server Model, Types of Servers, Role of A Network Administrator, Internetwork, Network Segmentation, LAN traffic congestion, Collision Domains, Broadcast Domain, Transmission modes, Ethernet, CSMA/CD (Carrier Sense Multiple Access with Collision Detection). Classification Of Transmission Media, Coaxial Cable, Twisted-pair cables, STP and UTP cables, Categories of Twisted cable, Cabling types, UTP Categories, Exploring UTP, Categories of Ethernet Cable, Fiber Optics Cable, OFC Connectors, Types of Fiber Optics Cable, Single vs Multi-Mode Fiber, Ethernet Cabling, Straight-Through Cable, Crossover Cable, Rolled over Cable, Causes of Transmission Impairment. Repeaters, Switch, MAC-Port Binding, Repeater, Hub,Bridge, Switch, Router, L3 Switch OSI Reference Model, Layers of the OSI Reference Model, Application Layer (Layer 7), Presentation Layer (Layer 6), Session Layer (Layer 5), Transport Layer (Layer 4), TCP, UDP, Reliable Communication with TCP, 3-Way Handshake, The TCP Sliding Window, Port Numbers, Common TCP& UDP Ports, Network Layer (Layer 3), Data Link Layer (Layer 2), Physical Layer(Layer 1), OSI Upper Layer & Bottom Layer, OSI Layer Functions, OSI PDU Term, Maximum transmission unit Checking with MTU, Changing the MTU size in Windows, Path MTU Discovery (PMTUD),Maximum Segment Size (MSS), Devices at OSI layer, TCP/IP, The roots of the internet, Some important TCP/IP milestones, MAC Address, Vendor / Ethernet/ Bluetooth MAC Address Lookup, MAC Address Format, IP Address, Physical Vs Logical Address, ARP Protocol TCP Header format, TCP Flags, UDP Header Format, IPv4 Header, Common Protocol Number, ICMP Protocol, Ethernet Frame Format, IP Address, Classes, IP Addressing Scheme	• Study of Ethernet Cabling: - Straight-Through Cable, Crossover Cable, Rolled Cable. • Verifying MTU of Network Changing the MTU size in OS.
	Network Primer -II Subnetting Basics, How to Create Subnets, Subnet Masks, Classless Inter-Domain Routing (CIDR), Subnetting Class C Addresses, Subnetting Class B Addresses, Physical Vs Logical Address, Public & Private IP Addresses	Practice on IP Subnetting on CLASS A,B & C networks.
	Network Primer –III IANA, Regional Internet Registry (RIR), local Internet registry (LIR), National Internet Registry (NIR), AfriNIC, APNIC, ARIN, LACNIC, RIPE NCC, Indian Registry for Internet Names and Numbers (IRINN), Internet Exchange Point, IANA Root Zone Database, IANA Number Resources, Regional Internet Registry (RIR),Internet, Network Registrar for .EDU.IN, .RES.IN, .AC.IN, .GOV.IN, List of Root Servers, Internet in India , SEA-ME-WE3,TCP/IP Troubleshooting utilities, Troubleshooting IP Addressing, hostname, ipconfig/ ifconfig / winipcfg, arp, ICMP Protocol, ICMP Protocol -Type, Ping, TTL, Default TTL Values, Changing the TTL On Popular Operating Systems, Ping Command Error Messages ,tracert/traceroute, Pathping, route, netstat, Possible Session States in netstat output,getmac,nslookup, DNS Resource Records, Troubleshooting IP Addressing	• Hands-on lab on Whois Domain Lookup, Whois IP lookup. Hands-on lab on Nslookup ,TCP/IP Utilities, hostname, Arp, Ping, tracert / traceroute, Netstat, Getmac, Nslookup
Unit 2	**Virtualization Primer** Introduction to Virtualization, What is virtualization Its advantages. Virtualization types & levels i.e. hardware, network, OS, Storage Virtualization, Server, Installation of VMware, Hyper-V, Hypervisor, Types of Hypervisor, Type-1, and Type-2, Types of Hardware Virtualization, Full Virtualization, Emulation Virtualization, Paravirtualization	Hands-on lab on Virtualization
Week 2		
Routing and Switching		
Unit 1	**Routing & Switching** Introduction to the Router , User Interface, Router OS, Connecting to a Router, Bringing up a Router, Setup Mode, Command-Line Interface, Logging into the Router, Overview of Router Modes, CLI Prompts, Basic commands, IP Routing, Routing Basics, Static Routing, Default Routing, Dynamic Routing, Routing Protocol Basics, Administrative Distances, Routing Protocols, Distance-Vector Routing Protocols, Maximum Hop Count, Route Poisoning, Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP), Enhanced IGRP (EIGRP), and Open Shortest Path First (OSPF) EIGRP Features and Operation, Open Shortest Path First (OSPF) Basics. The Router Boot Sequence Understanding the Configuration Register Bits, Checking the Current Configuration Register Value, Changing the Configuration Register, Recovering Passwords, Managing Traffic with Access Lists Introduction to Access Lists, Standard Access Lists, Wildcard Masking, Standard Access List Example, Controlling VTY (Telnet) Access, Extended Access Lists, Extended Access List Example, Named Access Lists, Monitoring Access Lists Network Address Translation NAT, Introduction to Network addresses Translation (NAT), Port address translation (PAT), Static NAT, Dynamic NAT, NAT Overloading ISM band, ISM band, 802.11a/b/g wireless standards, Adhoc, infrastructure mode of WLAN, Accin Repeater Mode, Security in WLAN, MAC Filtering, WEP/WPA.	Hands-on lab on Router, Bringing up a Router Routing Protocols Hands-on lab on Boot Sequence of Router, Configuration Register, Recovering Passwords, Hands-on lab on Network Address translation Hands-on lab on wireless Adhoc, infrastructure mode

Week 3		
Network Administration using Windows Server		
Unit 2	**Installing and Configuring Windows Server** Minimum system requirements for all editions of Windows Server, Clean Installation, Installing Windows Server , Installing Windows Server as a Server Core installation. Configuring NIC teaming.	Hands-on lab on Information Installing Windows Server
	Configure DHCP server. DHCP Operation, APIPA, Adding Role of DHCP Server, Configuration, DHCP Scope, Super scope, Reservation, DHCP testing and troubleshooting, DHCP Server monitoring, Monitoring DHCP Pool utilization, finding unauthorized DHCP Servers	Hands on Lab on DHCP Server Configuration
	Configure DNS server. Understanding the DNS Architecture, The DNS Name Space, Name Servers, Resolvers, Creating a DNS Standard, DNS Naming, DNS domain hierarchy, DNS Communications, Reverse Name Resolution, Deploying a DNS Server, Configure DNS zones: Configure primary and secondary zones; DNS zone types Zone delegation ,Split, Stub zones configure stub zones; configure conditional forwards; configure zone and , important types of resource record used by DNS servers, DNSSEC	Hands on lab on Deploying a DNS Server
	File Server Resource Manager Install the FSRM role ,configure File Server Resource Manager (FSRM), configure quotas; Configure file screens; configure reports, Implementing Classification and File Management Tasks.	Hands on lab on configure quotas; Configure file screens; configure reports
Unit 3	**Introduction to IIS** Components of IIS, IIS Web server, Configuring a website ,Configuring multiple website using multiple IP address, Virtual directory and multiple ports, Configuring a FTP site, Configuring multiple ftp sites using multiple IP address, Virtual directory and multiple ports **Securing IIS** IP Address and Domain Restrictions, Server Certificates and SSL, Enabling SSL/TLS for secure data communications, Securing Web Content, Enabling user authentication, Removing anonymous access, Selecting appropriate authentication modules, Restricting access to sensitive content Authorization, URL-Based Authorization	Hands on lab on Web Server Management with IIS
	Implementing and managing IPAM Overview of IPAM, Deploying IPAM, Managing IP address spaces by using IPAM	Hands on lab on IPAM
	Routing and Remote Access Installing and Configuring a Routing and Remote Access, Implementing VPN, Remote Access VPN Connections, Site-to-Site VPN Connections, VPN Configuration, Configure the Remote Access Server, Verify VPN connectivity in Windows 10 client	Hands on lab on Installing and Configuring a Routing and Remote Access , VPN
Unit 4	**Active Directory** Overview of AD DS, Overview of AD DS domain controllers, Deploying a domain controller, Managing user accounts, Managing groups in AD DS, Managing computer objects in AD DS, Using Windows Power Shell for AD DS administration. Implementing and managing OUs	Hands on lab on Installing and configuring domain controllers
	Implementing Group Policy AD Group Policy, types of GPOs, Group Policy container (GPC),Installation of Group Policy Management, Group Policy settings, Creating Multiple Local GPOs, Troubleshooting the Application of GPOs, GP Problems and Their Solutions	Hands on lab on Group Policy
	Managing User with Group Policy Configure Folder Redirection, Introducing Administrative Templates, Managing ADM files, Implementing Administrative Templates, Create Internet Explorer Restriction. Managing Software with Group Policy, Implementing Group Policy in Windows	Hands on lab on Managing User with Group Policy
Unit 5	**Distributed File System** Deploy (Distributed File System)DFS, deploy Distributed File System with DFS Replication, Install and Configure Distributed File System (DFS), Create a DFS NameSpace, Add a Namespace Server, Add Shared Folders to Root Namespace, Add Folder to DFS-Namespace server and Configure Replication	Hands on lab on Distributed File System
	Deploying and Maintaining Server Images New Features of WDS, WDS infrastructure for custom deployments, WDS management console, Installing Windows Deployment Services, Add Image To Windows Deployment Services, Installing an Operating System on Machines using WDS.	Hands on lab on Deploying and Maintaining Server Images
	WSUS Updates as Important, Recommended, or Optional, Type of updates, Security updates, Critical updates, Service packs, Installing updates, change Windows Update settings, Install Windows Server.Update Services Role, WSUS configuration, Move WSUS database to a new location	Hands-on lab on WSUS

Week 4		
Network Administration using Linux		
Unit 6	**Linux Introduction and File System** The CentOS Linux File system, The CentOS Shell, The CentOS Linux Utilities Installing Centos 7,Server Preparing for the Installation, Configuring the Server's Hard Drive, Starting the CentOS Server Installation Process, Completing the Installation	Hands-on lab on CentOS Installation Configuration,
	Command Line Utilities ,Working as root, working with the Shell, Performing Basic File System Management Tasks, Working with Directories, Working with Files, Viewing the Content of Text Files, Finding Files That Contain Specific Text , Creating Empty Files, Piping and Redirection, Piping, Redirection, Finding Files, Working with Vi Editor: Vi Modes, Saving and Quitting, Cut, Copy, and Paste, Deleting Text. Getting Help: Using man to Get Help, Getting Information on Installed Package	Command Line Utilities
Unit 7	**Managing Users and Groups, ACL** Commands for User Management, Managing Passwords, Modifying and Deleting User Accounts, Configuration Files, Creating Groups, Commands for Group Management, /etc/group, Using Group Passwords, Configuring Permissions, Read, Write, and Execute: Using unmask to Set Default Permissions for New Files, Working with Access Control Lists, Preparing the File System for ACLs, ACL Limitations, Applying File Attributes, Apply Quota to Allow a Maximum Amount of Files, Installing the Quota Software, Preparing the File System for Quota, Initializing Quota, Setting Quota for Users and Groups, Configuring Administrator Tasks with sudo	Hands-on lab on Managing Users and Groups, ACL
Unit 3	**File System Management Basic** Mounting Disks, Using the mount Command, Unmounting Devices, Automating Mounts with /etc/fstab, Checking File System Integrity, Working with Links: Working with Symbolic Links, Working with Hard Links. Configuring Storage, Comparing File Systems, Creating File Systems, Working with Logical Volumes	Hands-on lab on File System Management,
	Process and Boot Process Process Monitoring and Management, Different Kinds of Processes, Foreground and Background, Managing Processes Managing the GRUB Boot Loader, The GRUB Configuration File, Installing GRUB, Working with the GRUB Boot Menu, Runlevels	Process Monitoring and Management
Unit 4	**Configuring Network Interface** Configuring the Network Card, Using ifup, ifdown, and Related Tools, Using ifconfig, Using the ip Tool, Configuring the DNS Resolver, Configuring Network Card Properties with the Command, Troubleshooting Network Connections, Testing Connectivity, Testing Availability of Services, Monitoring the Network Interface.	Hands-on lab on, Configuring the Network Card
	Software Package Management Software Management, Software Repositories and Package Databases, Package Management Utilities, Using apt, Installing Software from Tarballs, Configuring a Graphical User Interface, Creating Backups, Making File Backups with tar, Making Device Backups Using dd, Configuring Logging, Configuring syslog, TELNET,SSH	Software Management, TELNET, SSH
	DHCP Configuring DHCP, Understanding the DHCP Protocol, Creating the DHCP Server Configuration, The DHCP Process, The /etc/dhcp/dhcpd.conf Configuration File, Advanced DHCP Configuration Options **DNS** DNS Hierarchy, Introducing Forward and Reverse DNS, Configuring DNS, Configuring Reversed Lookup, Testing Your Name Server	Hands-on lab on DHCP, DNS
Unit 5	**FTP, SAMBA** Sharing Files with Samba, Samba Server Possibilities and Impossibilities, Configuring the Samba Server, Client Access to the Samba Server	Hands-on lab on FTP,SAMBA Configuration
	NFS Sharing Files with NFS, Using the NFS Server, Understanding How the NFS Works, Configuring an NFS Server, Configuring an NFS Client, Monitoring the NFS Server **APACHE** Setting up Apache, Apache Components, Starting, Stopping, and Testing the Apache Web Server, The Structure of the Apache Configuration Files, Checking the Configuration, Working with Virtual Hosts, Configuring Virtual Hosts, Managing Access to the Web Server, Configuring Host-Based Access Restrictions, Configuring User-Based Access Restrictions	Hands-on lab on NFS, Apache Web Server,
	Firewall using IPTABLES &Squid Proxy Using iptables to create a Firewall , Configuring a Squid Proxy Server, Installing a Squid Proxy Cache, Configuring Squid Access Control Policies, Configuring User Authentication	IPTABLES and Squid Proxy
Week 5		
Cyber Security & Ethical Hacking		
Unit 1	**Exploring NMAP and Wireshark** Introduction to NMAP, Exploring Scanning using NMAP, NMAP Advanced Scanning Techniques, Introduction to Wireshark, Functionality of Wireshark, UI of Wireshark, Wireshark Capture Mode, Capturing Packets, Wireshark Filters, Detecting Network Attacks with Wireshark, Detection of host discovery (recon), Detection of network port scanning, Detection of wireless network attacks	Hands-on lab on NMAP and Wireshark

Unit 2	**Exploring Kali Linux** What is Kali Linux,Kali Linux Tools	
Unit 3	**Information Gathering and Countermeasures** Introduction to Ethical Hacking, What is hacking?, Definition of Hacking, Types of Hackers Introduction to Information Security, CIA Triad, Services & Techniques, Actives, Passive Threats and Exploit, etc. Introduction to Information Gathering, Phases of Information Gathering, Reconnaissance, Banner Grabbing, Web Ripping, Website at Offline Mode, Downloading Server Side Code, Foot Printing, Name Space Lookup, Trace Routing Techniques, Whois Lookup Query, Fingerprinting, 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 countermeasures. What is Open-source intelligence (OSINT), Types of OSINT, OSINT Process, Open Source Information Categories, OSINT Framework, OSINT Framework Classification, OSINT Framework Website, tools used for OSINT	Hands-on lab on Information Gathering , NMAP Scanning, Whois, nslookup and its countermeasures
Unit 4	**Sniffing, ARP Cache Poisoning, MITM Attacks. and Countermeasures** ARP Protocol, Sniffing ARP Cache Poisoning, Man in the Middle (MITM) Attacks, Type of MITM Attacks, Scenario for Sniffing & ARP Cache Poisoning, Countermeasures for Sniffing & ARP Cache Poisoning	Hands-on Lab on Sniffing, ARP Cache Poisoning, Man in the Middle (MITM) Attacks using Ettercap & its Countermeasures
Unit 5	**Password Cracking and Countermeasures** Hash function, Hash algorithm, Password Hashes, Types of password attacks, Password Cracking types, Dictionary Attack, Brute Force Attack, Hybrid Attack, Rainbow Table Attacks, Cracking Passwords using John the Ripper, Other password Cracking tools, How passwords are stored in Linux,/etc/passwd and /etc/shadow, Permissions of /etc/passwd and /etc/shadow, Salt, Displaying hashing Algorithm used in Linux, pwconv, and pwunconv, How passwords are stored in Windows, SSH Password Testing With Hydra, THC Hydra Commands, Hardening of SSH, Password Cracking Countermeasures.	Hands-on lab on Password cracking techniques, Password Testing With Hydra,exploring,/etc/passwd and /etc/shadow and its countermeasures
Unit 6	**IP Spoofing, Denial of Service, and Countermeasures** 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) ,hping, netstat, and its countermeasures
Unit 7	**Steganography** Information Hiding, Techniques Steganography, Information Hiding Techniques, Steganography, Types of Steganography, Difference Between Steganography and Cryptography, Steganography with CMD. Best Tools to Perform Steganography, Steganography using image file Steghide tool, Steganography with CMD, Steganography using image file Steghide tool, Scapy tool used for Steganography, ICMP, Steganography using ICMP Payload Scapy tool used for Steganography	Hands on lab on Facebook Security and WhatsApp security
Unit 8	**E-Mail Spoofing, Phishing, and Countermeasures** Concept of Email, SMTP, POP3 and IMAP, Email Spoofing, What is Phishing, Phishing Techniques 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.
Unit 9	**Web Application Primer & Browser Security** Web Application Primer, Working of website, Application ,WWW (World Wide Web), ,Types of website - Static Website, Dynamic Website, Front End, Back End, Scripting Language, Responsive Web Design (RWD),HTTP Protocol, Basic Features of HTTP, HTTP Version, HTTP Request / Response , URI , URL , URN, Cookies, Session, HTTP Architecture, Http Protocol Details, HTTP Parameters, HTTP Messages, HTTP Requests, ,HTTP Responses, HTTP Response Codes, HTTP Methods, GET,HEAD,POST,PUT,DELETE,CONNECT,OPTIONS,TRACE,HTTP Status Codes ,HTTP Header Fields, HTTP Security, HTTPS Protocol ,Basic Working of HTTPS Basics, Encoding and Decoding, Same Origin Policy (SOP)	Hands on lab on Web Application and Browser Security
Unit 10	**Penetration Testing using Metasploit** Introduction to Penetration Testing, Penetration testing methodology, Types of penetration testing, Pen Testing Techniques, Penetration Testing Tools, Examples of Free and Commercial Tools, and 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 Engineering Toolkit	Hands-on lab on Penetration Testing using Metasploit
Week 6		
Digital Forensics and Cyber Law		
Unit 1	**Introduction to Digital Forensics** Objectives of Digital Forensics, Elements of a Digital Crime, Process of Digital Forensics, Types of Digital Forensics, Digital Evidence, Digital Forensic Tools, Methodology for Digital Investigators, Evidence Collection Methods, Disk Imaging, Disk Cloning, Challenges faced by Digital Forensic Investigator	

Unit 2	**File & Disk Analysis** **Creating a Forensic Image and Analysis of Image** Introduction, What is a Forensic image, Create Image file for Forensics Investigation, Different tool used for Imaging, Mount Image, Tools used for Mount an Image, Analyzing Image Dump, Obtain Protected Files, disk drive signature **Forensic Investigation : Prefetch File** **Data Carving: Recover Lost or Deleted Files** Introduction to Data Carving, Recovering lost data, Disk structure and data recovery, Recovering files with data carving, Data carving challenges, USB Forensic Analysis	Hands on studying the file system ext3/ext4 etc, Investigating Deleted Files, Formatted Disks, File Carving, , Basic PDF and Word Document Analysis, encryption, compression, Password protection
Unit 3	**Memory Forensics** Introduction Memory Forensics: Acquisition Methods, Memory Forensic Tools, Examining Captured Data	Hands on to capture volatile data / Live data from RAM, Hands on to capture nonvolatile data from the system
Unit 4	**System & Network Forensics** **Windows Registry Forensics** Registry in Windows Forensics, Registry Hives, Registry Hive in Context, Registry Hive vs. Registry Key, Forensics Analysis of the Registry, Capturing and Examining the Registry **Network Forensics:** TCP/IP Protocol Suite, Classes of Traffic, Network Devices, Network Protocols (HTTP, Cryptography and SSL/TLS, SMTP, DNS, DHCP, ICMP, ARP), Protocol Analysis, Flow Analysis, File Carving & Data Extraction, More Web Forensics, Network Attacks, Steganography and Image File Forensics, md5sum,shasum	Hands on Lab Creating a Registry Hives, Capturing and Examining the Registry Hide data using CMD
Unit 5	**Logs, Timelines & Reporting** Introduction, Logging Infrastructure, Using Linux Tools for Log Analysis, Web Logs, Windows Events, Syslog Timeline Analysis : Introduction, Event Types, Timestamp Types, Timeline Fields, Creating Timelines	**Hands On:** Log Analysis using Linux
Unit 6	**Cyber Law** Cyber Crime Incidents at a Glance, Case filed against the Cyber Crime, What is Cyber Crime Category for Cyber Crimes, Background of Cyber Law, Cyber Legislation Worldwide, Background of Cyber Law, IT Act 2000,IT Act Amendments 2008, Need of IT Act 2000, Chapters in the IT Act , Schedules in IT Act, Need for IT Amendment Act 2008, Offenses in IT Act,22 Years of Milestones of IT Act, Statutory Bodies under IT Act, Powers under the IT Act, New IT Rules, 2021, Need for New IT law, Trends That Will Impact Cyber Law, Cyber Law, and Intellectual Property, Cases Studies of IT Act Sections, Cyber Cell & Cyber Fraud Helpline.	Case Study

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