

Cyber Security using Python

Cyber Security using Python**4 Weeks Online Course****4 Weeks / 60 Hrs. (3 Hrs. per day)****Batch Size: 20 (Limited Seats)****Medium of Instruction: Bilingual (English & Hindi)**

Objective

This course is designed with the aim to gain the knowledge of Python Programming and its applications in cyber security. Students will gain hands-on experience in writing Python scripts to automate security tools, conduct ethical hacking tasks, and simulate cyber defence mechanisms.

B.E.*/B.Tech.* (in Any Stream), MCA*/BCA*/B.Sc.* (IT/CS)/ M.Sc.* (IT/CS), Diploma* (CS/IT), NIELIT A Level (*pursuing candidate may also apply) OR Professional/Official with Graduation (in Any Stream) and working in relevant domain, having knowledge of programming fundamentals and Computer Networks.

Eligibility

Course Fees

Rs. 1800/- incl. GST & all other charges.

- ✓ Candidate must have latest computer/laptop with at least 4 GB RAM.
- ✓ Internet connection with good speed (preferably 2 Mbps or higher)
- ✓ Candidate must have basic understanding of Python Programming

Prerequisite

Certificate

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

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.

How to Apply?

Salient Features

Instructor Led Online Training**E-Learning Contents****Hands on Lab****Self-Assessment****Real World Demo**

Course Content

Day	Topic	Day	Topic	Day	Topic
Day #01	Cyber Security, Importance, Common Threats, CIA Triad, Ethical Hacking, Legal & Ethical Aspects	Day #02	Python in Cyber Security, Installing Python, VS Code Setup, Virtual Environment, Jupyter Notebook Installation	Day #03	First Python Script, Installing Cyber Security Libraries with pip
Day #04	Variables, Data Types, Input/Output, Conditions, Loops	Day #05	Functions, Exception Handling, Working with Modules, math, random, sys	Day #06	File Handling, Directory Traversal, OS Commands, Log Parsing, OS Libraries
Day #07	Basic Networking Concepts, IP Addressing, Subnetting & CIDR, Routing vs Switching, NAT, DHCP, DNS	Day #08	Networking Tools (ping, traceroute, etc.), Protocol Layers (TCP/IP model), ipaddress, socket, netifaces	Day #09	TCP and UDP Sockets, Server & Client Programs, IP Scanning, Simple Chat App
Day #10	Packet Structure & Sniffing, Real-time Capture, Parsing & Export, scapy tools	Day #11	Hashing & Encryption (MD5, SHA-256, AES, RSA), Password Security, cryptography libs	Day #12	HTTP Basics, Sending Requests, HTML Parsing, Form & Login Automation, requests, BeautifulSoup, selenium
Day #13	WHOIS Lookups, DNS Records, IP Geolocation, Subdomain Enumeration, whois, dnspython, ipwhois, shodan	Day #14	TCP Port Scanning, UDP Scan Basics, Banner Grabbing, Integration with Nmap, socket, nmap, masscan	Day #15	Dictionary Attacks, Login Form Automation, SSH/FTP Login Scripts, paramiko, ftplib, selenium
Day #16	Capturing Keystrokes, Saving Logs, Demo & Prevention Awareness, pynput, keyboard	Day #17	Monitoring Logs/Packets, Pattern Detection, Alert Mechanisms, scapy, os, re, time	Day #18	Secure Coding, Malware Analysis, Input Validation, XSS & SQLi Demos, flask, sqlite3
Day #19	Social Media OSINT, Tweet/Reddit Data, No-API Scraping, Sentiment & Hashtag Analysis, Visualization Tools	Day #20	Final Project Implementation, Debugging, Presentation and Demonstration		

COURSE COORDINATOR

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Course Details

S.No	Topic to be Covered
1	Introduction to Cyber Security and Python <ul style="list-style-type: none"> What is Cyber Security Importance of Cyber Security in the Digital Age Common Threats in Cyber Security <ul style="list-style-type: none"> Malware Phishing Ransomware Denial-of-Service (DoS) Man-in-the-Middle (MitM) CIA Triad – Confidentiality, Integrity, Availability Ethical Hacking Overview Legal and Ethical Aspects Role of Python in Cyber Security <ul style="list-style-type: none"> Automation Scripting for Attacks and Defense Real-World Use Cases Examples of Capabilities (e.g., file handling, system interaction, network scanning)
2	Setting up Python Environment <ul style="list-style-type: none"> Installing Python (latest version recommended: Python 3.10+) Installing and Customizing Visual Studio Code (VS Code) <ul style="list-style-type: none"> Python Extension Code Runner Terminal access Folder/project management Git integration (for version control) Installing Python via Windows Store / python.org Creating Virtual Environment (using venv) Installing Jupyter Notebook (via pip) Writing and Running First Python Script Installing Key Python Libraries Using pip Common libraries to install for Cyber Security: <ul style="list-style-type: none"> - requests – Web interaction - beautifulsoup4 – Web scraping - scapy – Packet manipulation/sniffing - nmap / python-nmap – Network scanning - paramiko – SSH automation - pwntools – Exploit development - dnspython – DNS queries - flask – Web app (e.g., phishing simulation) - mitmproxy – Interception proxy for HTTP/HTTPS - cryptography – Hashing and encryption - argparse – Command-line interfaces

3	Python Programming Essentials <ul style="list-style-type: none"> Variables, Data Types, Input/Output Conditions, Loops, Functions Exception Handling Working with Modules Python Libraries: math, random, sys
4	File Handling and OS Interaction <ul style="list-style-type: none"> Reading/Writing Files Directory Traversal OS-level Commands Execution Log File Parsing Python Libraries: os, shutil, pathlib, subprocess
5	Network Primer <ul style="list-style-type: none"> Basic Networking Concepts IP Addressing (IPv4 vs IPv6) Subnetting & CIDR Routing vs Switching NAT, DHCP, DNS Networking Tools: <ul style="list-style-type: none"> - ping, traceroute, ipconfig, ifconfig, netstat, nslookup, dig Understanding Protocol Layers (TCP/IP model) Python Libraries: ipaddress, socket, subprocess, netifaces
6	Networking with Python <ul style="list-style-type: none"> Sockets (TCP, UDP) Server & Client Programs IP Scanning Python Libraries: socket, ipaddress
7	Packet Sniffing & Wireshark-like Implementation <ul style="list-style-type: none"> Understanding Packets (Ethernet, IP, TCP/UDP, HTTP) Real-time Packet Capture Packet Parsing Displaying Headers like Wireshark Exporting to .pcap or readable formats Python Libraries: scapy, socket, dpkt (optional advanced parsing)
8	Cryptography & Hashing <ul style="list-style-type: none"> Hashing (MD5, SHA-256) Symmetric Encryption (AES) Asymmetric Encryption (RSA) Password Hashing & Salting Python Libraries: hashlib, cryptography, pycryptodome, bcrypt
9	Web Scraping & Automation <ul style="list-style-type: none"> HTTP Basics Sending Requests Parsing HTML Auto-filling Forms / Login Automation Python Libraries: requests, BeautifulSoup, selenium

10	OSINT & Reconnaissance <ul style="list-style-type: none"> • WHOIS Lookups • DNS Records • IP Geolocation • Subdomain Enumeration • Python Libraries: whois, dnspython, ipwhois, shodan (optional)
11	Port Scanning & Vulnerability Detection <ul style="list-style-type: none"> • TCP Port Scanning • UDP Scan Basics • Banner Grabbing • Integration with Nmap • Python Libraries: socket, nmap (with python-nmap), masscan (via subprocess)
12	Brute Force & Credential Testing <ul style="list-style-type: none"> • Dictionary Attacks • Login Form Automation • SSH/FTP Login Scripts • Python Libraries: paramiko (for SSH), ftplib, selenium
13	Keylogging (Awareness Only) <ul style="list-style-type: none"> • Capturing Keystrokes • Saving Logs • Demo & Prevention Awareness • Python Libraries: pynput, keyboard
14	Intrusion Detection Basics <ul style="list-style-type: none"> • Monitoring Logs/Packets • Pattern Detection (Rule-based) • Alert Mechanisms • Python Libraries: scapy, os, re, time
15	Secure Coding & Malware Awareness <ul style="list-style-type: none"> • Secure Input Handling • Avoiding Common Attacks • Static Malware Analysis • File Integrity Verification • Python Libraries: hashlib, os, re
16	Web Application Security <ul style="list-style-type: none"> • XSS and SQL Injection Demos • Securing Forms • Preventing Code Injection • Python Libraries: flask (for demo apps), html (escaping), sqlite3

17	Social Media Analysis for OSINT <ul style="list-style-type: none">• Social Media in Cyber Threats• Collecting Tweets using tweepy• Reddit Data via praw• No-API Scraping using snsrape• Sentiment Analysis• Hashtag Alerting• Visualization• Python Libraries: tweepy, praw, snsrape, TextBlob, nltk, vaderSentiment, matplotlib, seaborn, wordcloud
18	Project Development <ul style="list-style-type: none">• Planning & Designing• Testing & Documentation• Presentation Preparation Project ideas: <ul style="list-style-type: none">• Packet Sniffer / Wireshark Clone• Port Scanner• Twitter Threat Monitor• IDS System• Simple Vulnerability Scanner