

Cyber Security and Ethical Hacking

Programme Director: Prof. Selwyn Paul J

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Number of Hours: 90 Hours Credits 3

Course fees: Rs.3, 500 /-

Course Objectives

The course provides dual career options for students in the field of Cyber Security, Ethical Hacking and Forensics

These sectors have the potential to grow exponentially and will provide challenging job opportunities for young professionals with the right skill sets.

The course provides students with an understanding of the concepts of information security. The focus will be on the models, tools and techniques for enforcement of security policies, with emphasis on cryptography, ethical hacking, and computer forensics

Syllabus

Unit -1

**Cyber Security and Cyber Laws
hours**

15

Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats: - Cyber Warfare-Cyber Crime-Cyber Terrorism-Cyber Espionage, need for a Comprehensive Cyber Security Policy, Need for an International convention on Cyberspace. Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2017.

Unit -2

Network Security

15 hours

Introduction to the Concepts of Security, Security Approaches, Principles of Security, Types of Attacks, Intruders, (IDS and IPS) Intrusion Detection and Prevention System, Password Management, Viruses and Related Threats, MFA (Multifactor Authentication) DOS (Denial of Service) And DDOS Distributed Denial of Service Attack, Firewall, Design Principles, Virtual Private Network (VPN).

Unit – 3

Cryptography hours

15

Convention Encryption Model, Steganography, Classical Encryption Techniques, Simplified DES, Block Cipher Principles, study on cryptography Algorithms, comparison study on cryptography encryption algorithms, Hash functions, Digital signature, comparison of SSL and TLS, Security protocols.

Unit -4

Ethical Hacking hours

15

Introduction to Ethical Hacking - Classes of hacker, hacking methodology, Penetration testing, **Scanning and Enumeration** – Types of scanning, OS finger printing **Sniffing and Social Engineering** – MAC flooding, DHCP attack, MCA spoofing, impact of social engineering, **Dos and Session Hijacking** – DDoS attack methodology, spoofing vs hijacking at the application level, session hijacking defensive strategies, **Web Server and applications** – client server relationship, vulnerabilities of web server and applications.

Unit- 5

Cyber Forensics

15 hours

Overview of Cyber Forensics – Preparing digital investigation, private sector investigation, **Data Acquisition and Incident Scenes** – Understanding storage format for digital investigation, Examining NTFS disk, **Network and Cloud Forensics** – Developing procedure for network forensics, challenges in cloud forensics, acquisition in cloud forensics, **Email and Social Media Forensics** – exploring the role of email and server investigation, **Forensics Report Writing and Ethics for Expert Witness** - Understanding the importance of reports, guidelines for writing reports and generating report using forensic software.

Virtual Lab Sessions and Assignments 15 hours

□ Ethical Hacking Lab

- AIM: 1. Program to scan vulnerability ports.
2. External Network scanning using Supers can tool.
3. SQL injection attack

Network Security Lab

- AIM: 1. Network Sniffing and Collection of Information in the Network.
2. To degrade the performance of the system using DOS attacks.
3. Manipulate the database using SQL Map.
4. Monitor malicious activity on your system.
5. Performance monitor.

Cyber Forensics Lab

- AIM: 1. recovering of deleted data from the storage medium.
2. Image creation from seized storage medium.
3. FAW – Forensic acquisition of website.
4. Autopsy – storage media analysis.
5. Email header using Email header pro.

References:

1. Introduction to cyber security – Jeetendra Pande
2. cryptography and network security by William Stallings 7th edition
3. cryptography and network security by Atulkahate
4. ETHICAL HACKING: A Comprehensive Beginner's Guide to Learn and Master Ethical Hein smith and Hilary Morrison
5. Cyber Forensics published by oxford university press

Blue Print

Sl no	Chapters	Hours
Unit -1	Cyber Security and Cyber Laws	15
Unit -2	Network Security	15
Unit -3	Cryptography	15
Unit -4	Ethical Hacking	15
Unit -5	Cyber Forensics	15
Practical and Assignment	Ethical Hacking, Network Security, Cyber Forensics Lab	15