

Indian Institute of Information and Technology, Allahabad

Lecture List

Network Security
Credit hours: 3 hrs

Total lectures: 45
Program: M.Tech (CLIS) (2nd Sem)

Course Objective

This course provides an essential study of network security issues and methods in networking systems. Topics to be covered include review of networking, access control, distributed authentication, TCP/IP security, firewalls, IPsec, Virtual Private Networks, and intrusion detection systems.

Detailed Syllabus*:

Lectures Required

Unit 1: Introduction to Network security, Model for Network security, Model for Network access security. (2 C Hrs)

Unit 2: Real-time Communication Security: Introduction to TCP/IP protocol stack, Implementation layers for security protocols and implications, IPsec: AH and ESP, IPsec: IKE. (7 C Hrs)

Unit 3: Media- Based-Vulnerabilities, Network Device Vulnerabilities, Back Doors, Denial of Service (DoS), Spoofing, Man-in-the-Middle, and replay, Protocol-Based Attacks, DNS Attack, DNS Spoofing, DNS Poisoning, ARP Poisoning, TCP/IP Hijacking . (10 C Hrs)

Unit 4: Virtual LAN (VLAN) , Demilitarization Zone (DMZ) , Network Access Control (NAC), Proxy Server , Honey Pot , Network Intrusion Detection Systems (NIDS) and Host Network Intrusion Prevention Systems Protocol Analyzers, Internet Content Filters, Integrated Network Security Hardware . (10 C Hrs)

Unit 5: Authentication: Kerberos, X.509 Authentication Service, Scanning: Port Scanning, Port Knocking- Advantages, Disadvantages. Peer to Peer security.(4 C Hrs)

Unit 6: Electronic Mail Security: Distribution lists, Establishing keys, Privacy, source authentication, message integrity, non-repudiation, proof of submission, proof of delivery, message flow confidentiality, anonymity, Pretty Good Privacy (PGP) (6 C Hrs)

Unit 7: Firewalls and Web Security: Packet filters, Application level gateways, Encrypted tunnels, Cookies. Assignments on latest network security techniques, Security applications in wireless sensor network and wireless Communication networks (6 C Hrs)

Text Books

Mark Ciampa “Security + Guide to Network Security Fundamentals/Edition 3” Cengage Learning publisher, • ISBN-10: 1428340661 • ISBN-13: 978-1428340664

William Stallings, “Cryptography and Network Security – Principles and Practices”, Prentice Hall of India, Third Edition, 2003.

Reference Books

Cisco: Fundamentals of Network Security Companion Guide (Cisco Networking Academy Program).

Saadat Malik, Saadat Malik. “Network Security Principles and Practices (CCIE Professional Development)”. Pearson Education. 2002. (ISBN: 1587050250) .

* Subject to Modification.