

Course Title: Network Security

Course no: CSC-455

Credit hours: 3

Full Marks: 60+20+20

Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Study of different network security concepts and methods

Goal: In this age of universal electronic connectivity, viruses and hackers, electronic eavesdropping, and electronic fraud, security is paramount. This course provides a practical survey of the principles and practice of network security.

Course Contents:

1. Introduction

6hrs.

- 1.1 Computer Security Concepts
- 1.2 The OSI Security Architecture
- 1.3 Security Attacks
- 1.4 Security Services
- 1.5 Security Mechanisms
- 1.6 A Model for Network Security

2. Key Management and Distribution

5Hrs.

- 2.1 Symmetric Key Distribution Using Symmetric Encryption
- 2.2 Symmetric Key Distribution Using Asymmetric Encryption
- 2.3 Distribution of Public Keys
- 2.4 X.509 Certificates
- 2.5 Public Key Infrastructure

3. User Authentication Protocols

6Hrs.

- 3.1 Remote User Authentication Principles
- 3.2 Remote User Authentication Using Symmetric Encryption
- 3.3 Kerberos
- 3.4 Remote User Authentication Using Asymmetric Encryption
- 3.5 Federated Identity Management

4. Transport-Level Security

6Hrs.

- 4.1 Web Security Issues
- 4.2 Secure Sockets Layer (SSL)
- 4.3 Transport Layer Security (TLS)
- 4.4 HTTPS

4.5 Secure Shell (SSH)

5. Wireless Network Security

7Hrs.

- 5.1 IEEE 802.11 Wireless LAN Overview
- 5.2 IEEE 802.11i Wireless LAN Security
- 5.3 Wireless Application Protocol Overview
- 5.4 Wireless Transport Layer Security
- 5.5 WAP End-to-End Security

6. Electronic Mail Security

3Hrs.

- 6.1 Pretty Good Privacy (PGP)
- 6.2 S/MIME
- 6.3 DomainKeys Identified Mail (DKIM)

7. IP Security

8Hrs.

- 7.1 IP Security Overview
- 7.2 IP Security Policy
- 7.3 Encapsulating Security Payload
- 7.4 Combining Security Associations
- 7.5 Internet Key Exchange
- 7.6 Cryptographic Suites

8. Cyber Security Overview

4Hrs.

Laboratory Work: All the features covered in this syllabus.

Reference Book:

Cryptography and Network Security: Principles and Practice, 5/E, **William Stallings**, ISBN-10: 0136097049, Prentice Hall, India Limited