

Outline of Two Semester Advance Diploma Course in Hardware Networking and Security

Ist Semester

(a) Theory Papers

Paper	Title	Max. Marks
Paper I	PC & PERIPHERAL ARCHITECTURE	50
Paper II	OPERATING SYSTEM & DIAGNOSTIC UTILITIES	50
Paper III	BASIC NETWORK	50
Paper IV	NETWORKING THROUGH WINDOWS-2003	50
Paper V	PROGRAMMING TOOLS AND TECHNIQUES	50

b) Practical PR-1 100

II nd Semester

(a) Theory Papers

Paper	Title	Max. Marks
Paper I	NETWORKING THROUGH LINUX	50
Paper II	NETWORK SECURITY	50
Paper III	ADVANCE NETWORKING	50
Paper IV	WIRELESS NETWORK	50
Paper V	SYSTEM SECURITY	50

(b) Practical PR-2 100

ELIGIBILITY: 10+2/ITI/Diploma/Graduate/ PGDCA/ Post Graduate/
BCA/B.E./B.Tech/MCA

COURSE FEE: ₹.27, 000/- (Payable in two installments)

Exam FEE: ₹. 950/- + S.T. per Semester

Duration : Two Semesters (one year)

Detailed of Courses of Two Semester PG Diploma Course in
Hardware Networking and Security
First Semester

Paper-I

PC & PERIPHERAL ARCHITECTURE

1. WHAT IS A COMPUTER:

The basic building blocks of a computer system- the CPU , the Arithmetic & Logical Unit . The binary numbers as a language which computer understands, interprets and processes. The Input & Output devices as means of communication with the Computer system.

The concept of hardware & the software - the two main components of a computer system. The data & the information. The importance of information flow & its impact on growth & productivity.

2. COMPUTER AS AN ELECTRONIC MACHINE- The need for study of Electronics & Electronic components for understanding the working of computer & Peripherals from hardware Point of view.

3. ELECTRONIC COMPONENTS

Passive & active components. Resistance & Capacitance & Inductance's.

RESISTANCE

Standardization, color codes, power rating specifications and properties of fixed and variable resistors. Specifications and properties of thermostats.

CAPACITORS

Introduction, standardization, and color codes characteristics of capacitor tolerance, temperature coefficient, type of capacitors and their applications.

INDUCTIVE COMPONENTS

Introduction to magnetic materials and their properties, inductor, characteristics, types of inductors, their features and specifications, transformers, types of transformers.

Connectors, Relays, Switches And Panel Components

Introduction to relays, their characteristics classifications, and performance during pick up and drop out, introduction to connectors and switches, different types and their applications, panel components.

4. Active Components

Introduction to Diodes, their characteristics and applications, Zener diodes and their characteristics and impedance, introduction to Bipolar transistors and their applications, functions, specification, testing of Diodes and Transistors. Introduction to operational amplifiers (OP Amps) and simple circuits

5. MEASURING INSTRUMENTS

Basics of Digital Multimeters, Cathode Ray Oscilloscope, Soldering & Desoldering Techniques.

6. Digital and Integrated Circuits

Introduction to logic levels & gates, Latches, unidirectional & bi-directional buffers, tristate devices, Clock generators, Flip-flops, Registers, Counters, Multiplexers & Demultiplexers. Introduction to various logic families and their characteristic, Bipolar Logic Family, Unipolar Logic Families. Latest trends in packaging.

7. Semiconductor Memories:

Hierarchy of memories used in a computer, Classification of memories and trends in PC memory modules.

8. Power Supplies

Constituents of Power Supplies

Introduction to half wave, full wave and bridge rectifier circuits, introduction to regulated power supplies (linear), power supply filters, three terminal regulators and regulated power supply using three terminal regulators.

9 ARCHITECTURE OF PC PERIPHERALS

Switch Mode Power Supply: Discrete components, principle of operation SMPS, converter topologies, PWM IC's and case study.

Monitors: CRT construction and working, 9 pin input type-monitor, block diagram of colour monitor.

Floppy Disk Drive: Its construction, basic principle of operation, disk drive types, installation, cables, connectors and jumper details, formatting and managing hard disk drive. Various interface standards.

Keyboard: Block diagram of keyboard circuit.

Printer: Types & components of printers, printer interface with computer, detailed circuit study of Dot Matrix Printer, function block diagram for various sub assemblies of printer, principle of operation of Laser and Inkjet printers, various mechanical sub-assemblies, general maintenance aspects.

Hard disk drive and interfaces, construction of HDD, encoding scheme: FM, MFM, RLL, installing HDD.

Main Reading:

1. Principles of Electronics By V.K.Mehta and Rohit Mehta,
Publisher: S.Chand and Company Limited New Delhi
2. IBM PC and Clones Hardware Troubleshooting and Maintenance By
B.Govindarajalu Publisher:Tata McGRAW-Hill publishing company limited
New Delhi

Reference Reading:

1. Floppy disk Internals By Rajneesh Kapur, BPB Publication New Delhi
2. Floppy Disk Internals, by Rajneesh Kapoor, BPB Publication, New Delhi.\
3. Power Supplies, Switching Regulators, Invertor and Converters, by Irving M. Gottlieb, ,
BPB Publication, New Delhi.
4. Switching Mode Power Supply Design, by P.R.K.Chetty.

Paper-II

OPERATING SYSTEM & DIAGNOSTIC UTILITIES

1. BIOS, POST & DOS BATCH FILES

Concept of BIOS, POST its error codes and their interpretation, DOS, internal and external commands of DOS, detailed description of CMOS setup and meaning of its various setting CMOS password setting. The DOS batch files, detailed description of DOS batch files config.sys and autoexec.bat, their creation and editing the commands of config.sys file and their order, a sample of config. Sys and autoexec. bat files.

2. WINDOWS XP BASICS

Introduction, Objective, features of Windows XP, Comparison – Professional Vs Home edition, Windows XP Installation, Preparation before installation, Performing a clean Installation, Activating Windows XP, Security Feature of Windows XP Permissions and Rights, User Accounts, Account Type, User Profile, Accessing User Accounts, Creating a User Account, Changing Account Settings, Deleting an Account, Logging off and Locking, Administrator Login, Setting a Password, Getting Help, Installing a program under Windows XP.

3. VISTA

Introduction Windows Vista, Getting Started with Windows Vista, Working with Windows Vista, Making things happen with Windows Vista, Automating Vista, Interfacing windows and Hardware, Running Windows Vista in a connected world, Making Vista work better for you.

4. Windows 7

Discovering the new features, Installing Windows7, Navigating the system, Evaluating alternate installation options, Discovering the features, installing Windows 7.0, navigating the system Evaluating alternate installation options, Ensuring optimal configurations, troubleshooting and restoring, creating and modifying security boundaries, operating within an active directory domain, configuring and controlling user environments, customizing user account control, implementing discretionary access control (DAC), securing and auditing the system, Encrypting drives and devices, configuring TCP/IP functionality, network location awareness, connecting to wireless networks, sharing and accessing resources, accessing the enterprise remotely, Leveraging built in technologies, monitoring and analyzing applications, ensuring application compatibility.

5. BACK-UP PROCEDURE & DISASTER PREVENTION

Write protection of your software MS-DOS delete protection, crash recovery, preventing hard disk failures, Back-up & Restore procedures, types of back-up, media for back-up, RAID systems. Preparation of Bootable CD and FD.

5. GENERAL TROUBLESHOOTING AND MAINTENANCE

Assembly and disassembly of PC and its various parts, startup problems, run problems their identification and remedy, problem of keyboard, displays, printers, FDD's HDD's, CDD's, SMPS motherboard, their identification and remedy. Servicing and Trouble shooting of Mouse and Keyboard, Maintenance of UPS.

Main Reading:

1. PC Hardware and Maintenance by Scott and Mueller latest edition.
2. Microsoft Windows Vista By Greg Perry.
3. Windows XP Home and Professional Edition (Sybex).
4. Windows 7 product guide book by Microsoft(www.microsoft.com).

Reference books:

1. Modern All about Keyboard and Mouse. By Manohar Lotia(BPB)
2. Modern All about Motherboard(BPB)

Paper-III

BASIC NETWORK

1. Introduction to Networks

Introduction to Computer Networks, Element of Networks, Types of Networks, Network Topologies: Bus, Star, Mesh, Ring etc.

2 Media and Connections:

Common LAN Media: STP, UTP, Coaxial cable, Optical fiber, TIA/EIA standards, Making & testing Cable, Straight thru Cable, Crossover Cable , Connectors, Jacks, Patch Panels.

3 Networking Devices

NIC, Repeaters, Hub and its types, Bridges and their types, Switches, Routers.

4. Network Model

Description of the seven layers of OSI Model, TCP/IP Model, Comparison of OSI & TCP/IP Model.

5. Physical and Data Link Layer

MAC Sub-layer, LLC, MAC Addressing, Framing, Error control, Flow control, Token Ring, Ethernet, FDDI, Address Resolution Protocols.

6 Network and Transport Layer

Role of Network layer, Virtual Circuits, Datagram, Packet, Types of Routing, Routing Algorithms and Protocols, ICMP, Introduction to Transport layer, TCP and UDP Protocols and Comparison .Network Layer, IP address, IP address Classes, Basics of Sub-netting, Subnet Masking.

7. Presentation and Session Layer

Session layer function, Token Management and Session Layer Protocols, Presentation layer function and Protocols.

8. Application Layer

Introduction to Application Layer Protocols and their role. The Domain name system, Electronics Mail, the World Wide Web, FTP, Telnet, HTTP, DHCP

Main Reading:

1. Basic of Networking. "NIIT ", Prentice, Hall of India Private Limited.
2. Networking Protocols and Standards. "NIIT ", Prentice, Hall of India Private Limited.
3. Data and Computer Communication. " William Stallings", Prentice, Hall of India Private Limited.

Reference Reading:

1. Computer Networks. " Andrew S. Tenon Baum", Prentice, Hall of India Private Limited.
2. Data Communication And Network." Frouzen".

Paper-IV

NETWORKING THROUGH WINDOWS 2003

1. Introduction to Active Directory

What is Active Directory. Understanding the Features of Active Directory. Naming conventions logical structure of Active Directory. Windows 2000 domain organizational units (OUs), trees and forests. Objects and classes, schema, global catalog server. Installing Active Directory Replication, sites, Flexible Single Master Operations (FSMO), Domain Name System(DNS).

2. Managing and Security Resources

Control Panel: Adding plug and play devices. Adding non-plug and play hardware devices. Configuring display setting and multiple-display support. Troubleshooting desktop setting and video adapters. Network and dial-up connections. Folder phone and modem options. power options, configuring power schemes, advanced options and hibernation, configuring Advanced Power Management (APM).

Working with file systems, FAT, FAT32 NTFS. File conversion, understanding disks and volumes. Types of disks/partitions/volumes. Using disk management. Creating and formatting partitions. Upgrading a disk. Creating a simple volume/spanned, volume/striped, volume/mirrored, volume/RAID-5. Logical Drives, recovering disks and volumes.

3. Users and Groups

Creating, configuring, managing and troubleshooting User Accounts. Managing user profiles, account policies, user rights, authentication, creating and managing group accounts, groups on the local computer. Groups in Active Directory. System policy and group policy their types, management, order of application and troubleshooting.

4. Accessing Files and Folders

Managing file and folder attributes. Managing shared folder permissions. How user and group Permissions combine? Configuring and managing the distributed file system. Creating and configuring a Dfs Root/Dfs links, their types, replicas. Configuring client computers to use Dfs. Managing NTFS file and folder security, NTFS permissions, EFS. How user and group NTFS permissions combine? Taking ownership of files and folders. Configuring and monitoring disk quotas. Troubleshooting.

5. Managing Printing

Windows 2003 printing overview. Adding and connecting to printers. Connecting to shared network printers. Configuring printer pools. Scheduling of setting printer priorities. Configuring printer permissions. Using the printers folder to manage print Jobs. Redirecting print jobs to another print device and troubleshooting, Common printing problems.

6. Auditing and Security

Managing, auditing. Enabling and configuring system access, auditing enabling and configuring Object access. Auditing, monitoring and analyzing security events, using security templates, troubleshooting.

- 7. Backup and Recovery:** User data and system state, data backup types. Backup strategies, scheduling, recovering user data and system state, data recovering from a system failure. Using the recovery console to restore a system, using the emergency repair disk to restore a system.

8. Installing Active Directory

Installing Active Directory. What is DNS? what does DNS have to do with Active Directory? DNS domain names and naming conventions. Installing DNS for Active Directory, creating and configuring DNS zones, configuring zone transfers. Removing Active Directory. Verifying and troubleshooting an Active Directory installation. Organizational Unit (OU), Creating OUs, configuring OU, properties. Managing Active Directory objects. Locating objects in Active Directory. Publishing resources in Active Directory. Moving objects in Active Directory. Controlling Access to Active Directory Objects. Delegating administration of Active Directory objects.

9. TCP/ IP and related Services.

Review of TCP/IP protocol suite, DHCP (Scopes, Authorization) IIS RRAS, VPN, managing web and certificate services, managing terminal services, troubleshooting.

10. Monitoring, Optimizing, and Troubleshooting

Monitoring performance, using System Monitor/Network Monitor/Windows Task Manager, monitoring shared Folders. Optimizing and troubleshooting Performance/Memory Performance/Processor Performance/ Disk Performance/Network Performance/Application Performance. Optimizing Performance of the Server. Brief Overview of Active Directory, replication partitions types, sites, subnet site links, site link bridges, global catalog server.

Main Reading

1. MCSE Windows server 2003 By Dan holme and Orin Thomas (PHI)

Reference Reading

1. Mastering Windows Server 2003 by Minasi (BPB)

Paper-V

Programming tools and techniques

Software management tools such as SCCS and make;

Programming with Perl,

1. Introduction:

Introduction to Perl, Downloading and Installation from Website, Writing and Running a Perl Program, Editing, Advantages.

2. Data Types

Scalar data and scalar variables: Number, String, Conversion between Numbers and String, Variable Interpolation, Arithmetic and Decimal Precision: Arrays: Initialization. Manipulation of Array elements: Associative Array (Hashes) : Initialization, Manipulation of Elements of Array.

3. Arithmetic and Logical Operators

Arithmetic Operators, Assignment Operators, Increment and Decrement Operators, String Concatenation and Repetition, Operators Precedence and Associativity, Conditional Operators, Logical Operators, Operators for manipulating arrays, Operators for Manipulating hashes.

4. Conditionals and Loops

Conditional Statement; if, if...else, if and if-else, unless statement, Loops: while, for, until, do...while, do...until and for each loops, last next, redo, continue and case switch statement.

5. Input and Output

Creating a file, Reading Data from a file, Writing data to a file, closing a file. Managing Files and Directories

6. Regular Expressions and Pattern Matching

Regular Expressions , Pattern Matching, Meta Character, Simple Pattern, Matching Group of Character, Matching Multiple Instances of Characters, Pattern Building; Pattern and Variable, Pattern and Loops, Using Pattern for Search and Replace, Matching Pattern over multiple Lines etc.

7. Function and Subroutines

Built-in Functions, Defining and calling Subroutines, Returning Values from Subroutines, Using Local Variables in Subroutines, Passing Values into Subroutine, Perl References, Perl Module and their Uses.

Programming in the windows environment;

Introduction to Visual C++
Object oriented Concepts
Data Types
Arithmetic and Logical Operators
Conditionals and Loops
Input and Output
Forms
Menus
Reports
MFC (Microsoft Foundation Classes)

Unix/Linux Shell Programming:

Shell scripts and execution methods. User's initialization file (.profile and rc, etc). The dot command. Interactive execution and command line arguments (\$1,\$2, etc). Meta Characters- syntactic (&&, (), &, ;;, <, > etc), pattern matching, substitute shell variables. Quoting, Test Command. Control flow : For, If While, Case. The Here document, String handling and computation using expr. Setting positional parameters (set command), and shift. Shell functions. Interrupt handling (trap), Korn and Bash shell features, let command, arrays.

References:

- (i) Programming with Perl books by 'O' riely Press
- (ii) Unix Shell Programming by Yashwant Kanetkar
- (iii) Unix concepts and applications by Sumitabha Das
- (iv) Practical Visual C++ Programming 2nd edition by Holzner PHI

Second Semester

Paper-I

NETWORKING THROUGH LINUX

1. INTRODUCTION TO LINUX & ITS DIFFERENT DISTRIBUTIONS

Introduction to Linux, different distributions of Linux and their relative merits and demerits, hardware requirements of installation of Linux .

2. INSTALLATION OF RED HAT LINUX

Hardware requirements for the installation, creating of boot diskette, choosing a partitioning scheme, swap partitions root partitions, Classes of installation, workstation class installation, server class installation, custom class installation, Server Installation-disk partitioning, configuring mouse, configuring networking, configuring time zone, specifying the root password and creating additional user accounts, installing the grub boot loader, selection of package groups, boot disk creation, Workstation installation.

3. STARTUP & SHUTDOWN OF LINUX SYSTEM

Loading the Boot Sector, Loading Linux form DOS or Windows, Loading the Kernel with Grub, Grub configuration options, setting server security, single user mode, changing the default operating system for booting, Hardware device driver initialization, Kernel version no, console initialization, speed index and memory calculation, CPU check, PCI bus initialization and probing, TCP/IP initialization. Disk drive initialization, Shutdown process.

4. WORKING WITH RED HAT LINUX

Logging into the Red Hat Linux, the login session, the shell interface Checking your login session, Checking directories and permissions, checking system activity, exiting the shell meaning of Red Hat Linux shell, use of Red Hat Linux, command locations in the file system running the commands already run, command line editing keystrokes for editing command lines, command line completion, connecting and expanding commands, piping commands, sequential commands, background, expanding commands, Red Hat Linux file system, creation of new files and directories in Linux, using meta characters in filenames, using file-redirection meta-characters, file permissions, moving copying and deleting files, text editor, vi, starting vi, moving around the file, searching the text, using numbers with commands for command repetitions.

5. X WINDOWS-INSTALLATION AND CONFIGURATION:

Introduction, Configuring X Windows using X configuration utility, Starting and stopping X, Windows managers, the function of windows managers in X setting the Windows manager, widgetsets, desktop environments, The role of desktop environment, Available desktops-GNOME, KDE, Xfce, CDE, mixing Desktop environment components, X applications.

6. LINUX SYSTEM ADMINISTRATION

Creating and maintaining user accounts, user accounts the/etc/passwd file, shadow passwords, creating of new users, adding new users, creating of users from command prompt, migrating users from other Unix systems, modifying user accounts manually, modifying user accounts, disabling user accounts, deleting user accounts, user groups, the function of groups,/etc/group file, adding new groups, changing group membership, modifying groups, deleting groups.

7. NETWORKING WITH LINUX USING TCP/IP

Understanding TCP/IP Networking, Network stacks, Network addresses, ports, TCP/IP configuration, configuring Network Hardware, using DHCP for configuration., Manually configuring TCP/IP setting the hostname, activating and interface, configuring the routing table specifying the DNS servers, testing the setup. File sharing sharing with Unix or Linux. NFS Sharing with Windows Samba Samba configuration options Setting global options, setting password options configuring file shares, using Samba as a client, Internet Servers, available servers using a super server, General Super server Considerations.

Main Reading:

1. Red Hat Fedora and Enterprises Linux 4 Bible. Christopher Negus ISBNP: 0-7645-9576-8 Wiley Publication.
2. Red Hat Linux Security and Optimization. Ben Rothke, Red Hat Press ISBN:0764547542.

Reference Reading:

1. Red Hat Enterprise Edition Reference Guide Manual- Red Hat Press.
2. System Administration Primer for Red Hat Linux Enterprise Edition. Red Hat Press.
3. Red Hat Linux Enterprise Edition Security Manual. Red Hat Press.

Paper-II

NETWORK SECURITY

Information Security Fundamentals, Background, Importance, Statistics, National and International scenario, Goals of Security confidentiality, Privacy, Integrity, Non-repudiation, Availability

Protocols weaknesses in IP/TCP and other protocols

Buffer overflow, brute force attacks, protocols attacks, cross site and other CGI vulnerabilities etc, Spoofing, Denial of service

Operating system Hardening, Internet protocols and security SSL.TLS, IPsec, SSH

Application security, WWW Security ,Secure Email.

Antivirus, Network scanners, firewall, IDS, Log analysis

Security Infrastructure

PKI, VPN

Ecommerce, security

Security Audits

Asset classification and Risk Analysis

Audit Trail, Reporting

Security Management

Security policies and procedures DRP/BCP

International standard

(CC/BS 7799,ITSEC/GLB/HIPAA)

References:

- (i) Hacking Exposed Scambrey McClure, Kartz-Tata Mcgraw Hill
- (ii) Open source Security tools by Howlett Prentice Hall
- (iii) Network Security the complete References by Bragg, Rhode-ousley, Strassher, Tata Mcgraw Hill

Paper-III

ADVANCE NETWORKING

- 1. Internetworking:**
Internetworking Basics, Internetworking Models, The Cisco Three Hierarchical Model-Core Layer, Distribution Layer & Access Layer.
- 2 Bridging / Switching:**
Switching Services, Spanning Tree Protocols, LAN Switch types- Cut Through, Fragment free, Store-and-forward, Configuration of Switches.
- 3 Virtual LANs (VLANs) :**
VLAN Basics, VLAN Membership, VLAN Trunking Protocols (VTP), Routing between VLANs, Configuration of VLAN.
- 4. Routing Protocols**
Define Flow Control and Describe the Three Basic Method Used In Networking. Add The RIP, IGRP, EIGRP, OSPF Routing Protocols and Configuration.
- 5. WAN Protocols:**
Introduction of WAN, Cabling the WAN, HDLC, PPP, LCP, Frame Relay, ISDN, DSL/ADSL.
- 6 Network Management:**
Configure Standard Access Lists to Filter IP Traffic, Configure Extended Access Lists to Filter IP Traffic, Monitor and Verify Selected Access List Operations on the Router, Troubleshoot Network Congestion Problem
- 7. Cisco Basics, IOS & Network Basics:**
Examine Router Elements, Router Boot Sequence, Managing Configuration Registers, Identify Main Cisco IOS Command, Prepare to Backup, Upgrade and Restore Cisco IOS Software Image. Prepare the Initial Configuration of Router

Main Reading:

1. CCNA Cisco certified Network Associate Study Guide
By Todd Lammle 5th edition (BPB)
2. CCNA Deluxe Edition
By Todd Lammle
3. CCNA Study Guide
By Richard Deal (Tata McGraw Hill)

Reference Reading

1. CCNA for Dummies
By Ron Gilster
2. CCNA Certification Library
By Wendell Odom.
3. CCNA Virtual Lab Platinum Edition
By Todd Lammle.

Paper-IV

WIRELESS NETWORK

1. **Overview of Wireless Network**
Introduction to wireless Network, different generation of Wireless System
2. **Characteristics of Wireless Medium**
Radio propagation mechanisms; reflection, diffraction and scattering, multipath & Doppler
3. **Physical Layer Alternatives for Wireless Networks**
Wireless transmission techniques, Consideration in the design of wireless Modem, Short Distance Base Band Transmission, Comparison of modulation themes, Coding techniques for wireless communications.
4. **Wireless Medium Access Alternatives**
Introduction to multiple access technique, Frequency Division Multiple Access (FDMA) and Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Comparison of CDMA, TDMA, FDMA, Random Access Methods for mobile Data Services, Access methods for wireless LANs.
5. **Network Planning**
Wireless network topologies, cellular topology, cell fundamentals, capacity expansion techniques, network planning for CDMA systems.
6. **Introduction to Wireless LAN**
Evaluation of WLAN, Wireless Home Networking, IEEE 802.11 standard for WLAN,
7. **GSM and TDMA Technology:**
What is GSM? GSM Services and features, system architecture, Call Establishment Mechanism, Handover Mechanism, Security Mechanism.
8. **CDMA Technology:**
What is CDMA? CDMA Forward channel, CDMA Reverse channel, packet & frame formats, mobility management,
9. **Mobile Data Networks:**
What is mobile Data?, GPRS, Mobility Support in GPRS, Short Messaging Service in GSM, Wireless Application Protocol (WAP),
10. **Bluetooth Technology:**
Introduction to Bluetooth technology, Overall architecture, protocol stack, physical connection, MAC mechanism, connection management,
11. **Overview of Wireless Broadband Networking**

Planning and designing wireless Broadband, satellite communications and application.

Main Reading:

1. "WIRELESS COMMUNICATION". IInd edition principles and practice by Theodore S.Rappaport, publisher Prentice Hall,India.
2. "WIRELESS DIGITAL COMMUNICATION" Modulation and Spread Spectrum Application by Dr.Kamilo Feher, publisher Prentice Hall India.
3. "COMMUNICATION SYSTEMS" 4th edition, by Simon Haykin Publisher: John Wiley & Sons, Inc.

Reference Reading :

1. "Wireless communication technology" By Roy Blake,Publisher: Delmar, Thomson Learning
2. 3G Wireless, Demystified by Lawrence Harte,Richard Levine,Roman Kikta

Paper-V

SYSTEM SECURITY

Introduction

Need and basic goals for computer security, security threats etc.

Operating System Security

Low-level protection mechanisms, access control: models for access control, some confidentiality, integrity and hybrid models of access control such as Bell-La Padula, Biba, Chinese Wall etc, discretionary v/s mandatory access control. Case studies: Java access control specifications, SELinux – security model and implementation.

Program flaws

Bugs which have security implications such as buffer overflows, race conditions etc.

Malicious code

Viruses, worms, Trojan horses: how they work and how to defend against them.

Authentication and authorization techniques.

Passwords, shadow files, one-time passwords, Bio-metric based identification and authentication systems. Smart cards. Kerberos.

Dealing with spam. Secure email systems. PGP, SMIME, etc.

Encryption of multimedia data. Digital Watermarking. Steganography.

Covert channels.

Disaster management.

References:

- (i) Cryptography and Network Security by William Stallings
- (ii) Network Security by Charlie Kaufman
- (iii) SE Linux by Example Mayer, MacMillan Caplan Prentice Hall.