VEER NARMAD SOUTH GUJARAT UNIVERSITY

Syllabus

MCA (5th Semester)

Paper : 503 : Networking Essential & Its Security

1. Networking Essentials

- 1.1 Repeaters and Bridges
  - 1.1.1 LAN Expansion
  - 1.1.2 Repeaters
  - 1.1.3 Bridges
  - 1.1.4 How Brides work
  - 1.1.5 Creating the routing tables
  - 1.1.6 Segmenting network traffic
  - 1.1.7 Remote bridges
  - 1.1.8 Differentiating between bridges and repeaters
- 1.2 Routers & Gateways
  - 1.2.1 Routers
  - 1.2.2 How Routers work
  - 1.2.3 Routing Benefits
  - 1.2.4 Routing Protocols
  - 1.2.5 Routing V/S Bridging
  - 1.2.6 Brouters
  - 1.2.7 Gateways
  - 1.2.8 How gateways work
- 1.3 Network Administration
  - 1.3.1 Bottlenecks
  - 1.3.2 Simple Network Management Protocols
  - 1.3.3 Data Protection
  - 1.3.4 Backup Methods
  - 1.3.5 Testing and Storage
  - 1.3.6 Implementing a backup system
  - 1.3.7 Uninterruptible Power Supply
  - 1.3.8 Implementing Fault Tolerance Systems
    - 1.3.8.1 RAID
    - 1.3.8.2 Sector Sparing
- 1.4 Advance WAN Transmission
  - 1.4.1 Overview
  - 1.4.2 Multiplexing, Packet and Circuit Switching networks
  - 1.4.3 X.25
  - 1.4.4 Asynchronous Transfer Mode (ATM)
  - 1.4.5 ISDN
  - 1.4.6 SONET
  - 1.4.7 SMDS

1. Introduction to network security

2. **Cryptography Techniques**
   - 2.1. Classical cryptography
   - 2.2. Conventional cryptography
     - 2.2.1. DES
   - 2.3. Public-key cryptography
     - 2.3.1. RSA
   - 2.4. Digital signatures
     - 2.4.1. DSA

3. **Security services**
   - 3.1. Message integrity
   - 3.2. Confidentiality and authentication
   - 3.3. Certification and key management
     - 3.3.1. PKI

4. **Network security applications**
   - 4.1. IP security
     - 4.1.1. IPsec
   - 4.2. Web security
     - 4.2.1. SSL, TLS, SET
   - 4.3. Electronic mail security
     - 4.3.1. PGP, S/MIME)
   - 4.4. SNMP security

5. **Access control in computer networks**
   - 5.1. Authentication protocols and services
     - 5.1.1. Kerberos and X.509
   - 5.2. Firewalls
   - 5.3. Virtual Private Networks (VPNs).

6. **System security**
   - 6.1 Intrusion detection
   - 6.2 Viruses

7. **Mobile system & E-commerce securities**
   - 8.1 3G security
   - 8.2 e-payment systems
   - 8.3 fair data exchange

REFRENCES :-

1. W. Stallings, Cryptography and Network Security, 2/e, Pearson Education, 1999.
2. W. Stallings, Network Security Essentials: Applications and Standards, 1/e, Pearson Education, 2000.
3. E. Rescorla, SSL and TLS: designing and building secure systems, Addison-Wesley, 2001.
4. K M Phaltankar, Implementing Secure Intranets and Extranets, Artech House Publishers, 2000.
5. W. Ford, and M. Baum, Secure Electronic Commerce: Building the Infrastructure for Digital Signature and Encryption, Prentice Hall, 2001.
6. C. P. Pfleeger, Security in Computing, 2/e, Prentice Hall, 1997.
7. E. D. Zwicky, et al, Building Internet Firewalls, 2/e, O'Reilly, 2000. This is a best selling book covering firewall design and implementation.
8. M. Y. Rhee, CDMA Cellular Mobile Communications & Network Security, Prentice Hall, 1998.

VEER NARMAD SOUTH GUJARAT UNIVERSITY
Syllabus
MCA(5TH Semester)
PAPER : 504 : Network Administration(Linux)

1. **Networking and TCP/IP on Linux**
   - 1.1. Fundamentals of Linux Networking
   - 1.2. Fundamentals of TCP/IP on the Linux Operating System
   - 1.3. Advanced Linux TCP/IP Concepts
   - 1.4. Introduction to Dial-up Technologies

2. **Dynamic Host Configuration Protocol**
   - 2.1. Introduction to BOOTP and DHCP
   - 2.2. Installing and Examining a Linux DHCP server
   - 2.3. Examining Additional DHCP Options and Configurations

3. **Domain Name System**
   - 3.1. Introduction to the Domain Name System
   - 3.2 . Installing and Configuring DNS

4. **The Network File System**
   - 4.1. Introduction to the Network File System
   - 4.2. Configuring NFS

5. **Linux Remote Administration**
   - 5.1. Introduction to Remote Administration
   - 5.2. The Telnet Protocol
   - 5.3. The open secure Shell protocol

6. **The Cron Daemon**
   - 6.1. Introduction to Automation
   - 6.2. Configuring the Cron Daemon

7. **Samba**
   - 7.1. Introduction to Samba
   - 7.2. Cross-Platform Connectivity
   - 7.3 Installing and Configuring Samba

8. **Linux System-Wide Logging**
   - 8.1. Introduction to System-wide Logging
   - 8.2. Configuring System-Logging

9. **The Network Information Service**
   - 9.1. Introduction to NIS
   - 9.2. Setting Up and Configuring an NIS server

REFRENCES :-

1. TCP/IP Network Administration - Craig Hunt - O'Reilly & Associates, Inc.
2. Managing NFS and NIS - Hal Stern - O'Reilly & Associates, Inc.
3. DNS and BIND - Albitz/Liu - O'Reilly & Associates, Inc.
4. Sendmail - Bryan Costales/Eric Allman/Neil Rickert - O'Reilly & Associates, Inc.
5. UNIX System Administration Handbook - Nemeth/Snyder/Seebass - Second Edition - Prentice Hall.

VEER NARMAD SOUTH GUJARAT UNIVERSITY
Syllabus
MCA(5TH Semester)
PAPER : 505 : Wireless Network & Mobile Computing

1. **Introduction to Wireless Network**
   - 1.1. Introduction
   - 1.2. Standards
   - 1.3. Emerging Technologies

2. **Introduction to Networking Technologies**
   - 2.1. OSI Basics
   - 2.2. LAN Basics
   - 2.3. LAN & WAN Protocols
   - 2.4. Internet Protocol

3. **Wireless LAN Technologies**
   - 3.1. Frequency Hopping Spread Spectrum
   - 3.2. Direct Sequence Spread Spectrum (DSSS)
   - 3.3. Interference
   - 3.4. RF Math
   - 3.5. Service Sets
   - 3.6. Mobile IP
   - 3.7. Appropriate use and design of wireless Networking

4. **Implementation**
   - 4.1. Multipath
   - 4.2. Co-location
   - 4.3. Power Variance Options
   - 4.4. Power-over-Ethernet (PoE)
   - 4.5. Earth Bulge
   - 4.6. Fresnel Zone
   - 4.7. Weather
   - 4.8. Line of Site (LOS)

5. **Physical and Mac Layers**
   - 5.1. Modulation & Bit coding
   - 5.2. Fragmentation
   - 5.3. SIFS / PIFS / DIFS / EIFS

6. **Hardware configuration and implementation**
   - 6.1. Access Points
   - 6.2. Bridges
   - 6.3. Workgroup bridges

6.4. Wireless Residential Gateways
6.5. Host Connectivity
6.6. Antennas, Cables, & Connectors

7. Wireless LAN Security
7.1. Filtering
7.2. Advanced Encryption Standard (AES)
7.3. Wired Equivalent Privacy (WEP)
7.4. Risks

8. Introduction to Mobile Computing and Personal Communications Services
8.1. Mobility, Nomadic, Mobile and Ubiquitous computing
8.2. Mobile Computing Architecture
8.3. Mobile Computing Technologies (Hardware, Software, Communication)
8.4. PCS Architecture, Mobility Management, Network Signaling

9. GSM System Overview
9.1. Introduction
9.2. GSM Architecture, Mobility Management, Network Signaling

10. GPRS
10.1. Architecture
10.2. Network Nodes

11. WAP
11.1. Mobile Internet Standards, WAP Gateway and Protocols
11.2. WML

12. 3G Mobile Services
12.1. Introduction to International Mobile Telecommunications
12.2. WCDMA
12.3. Quality Services of 3G Technology

13. Introduction to WLL, Virtual Networks, Bluetooth, IR, Bluetooth Protocols

REFRENCES :-

1. "Wireless and Mobile Network Architecture" by Yi-Bing Lin & Imrich Chlamtac, John Wiely & Sons, 2001
2. "Mobile and Personal Communication systems and services", by Raj Pandya, PHI 2001
3. "Guide to Designing and Implementing wireless LANs", by Mark Ciampa, Thomson learning, Vikas Publishing House, 2001
4. "Wireless Web Development", Ray Rischapter, Springinger publishing, 2000
5. "The Wireless Application Protocol", by Sandeep Singhal, Pearson Education Asia 2000.
6. "Third Generation Mobile Telecommunications Systems", by P.Stavronlakis, Springer Publishers, 2001.