AIT 223 COMPUTER NETWORKS 3(2+1)

Objective(s)

This course addresses the principles, architectures and protocols that have gone into the development of the Internet and modern networked applications. The course examines network design principles, underlying protocols, technologies and architectures such as naming, data transport, routing and algorithms for networked applications including messaging, encryption and authentication.

UNIT I

The importance of Networking, Types of Networking, Network Topology, Transmission Media, Data communication: Concepts of data, signal, channel, bandwidth, Network adapters card, Multiplexer (FDM, TDM, STDM), Hub, Repeater. Network References Models, Layered architecture, protocol hierarchies

UNIT II

Physical layer functionality, Data link layer function and protocols: Framing, error-control, flow control; sliding window protocol, CSMA and other DLL protocols

UNIT III

Network layer- IP addressing, classful-classless addressing, routing algorithms, congestion control algorithms; Internetworking, Transport layer -connection management, addressing; Flow control and buffering, multiplexing

UNIT IV

Session layer –RPC; Presentation layer -abstract syntax notation, Application layer -File Transfer Protocol (FTP), Telnet, Simple Mail Transfer Protocol(SMTP); World Wide Web(WWW) -Wide Area Indexed Servers, DNS

UNIT V

Security Technology –Intruders, Firewalls, Scanning and Analysis tools, Content filters, Advanced Encryption standard, Principles of public-key cryptosystem, Message authentication and Hash functions, Digital signatures, Digital certificate

UNIT – VI

Wireless Sensor Networks :Introduction to Wireless Sensor Networks, Sensor Nodes, Architecture – WSN, Topologies – WSN, Data Dissemination Architectures and Protocols, Data Gathering Algorithms, MAC Protocols for WSN, Exposure; Coverage and Deployment, Security

Practical(s)

1. An Overview of Campus Networks Design
    a. Router
    b. Workgroup Switch
    c. High-End Switch
    d. Multilayer Switch with Route Processor
2. Introduction to Motherboard & Installation of LAN Card
3. Introduction to LAN with its cables, connectors and topologies
4. To connect two personal computer with straight and cross over twisted pair
    a. identify the proper cable to connect the PCs to the hub
    b. Configure workstation IP address information
    c. Test connectivity using the ping command
5. Installation & working of Remote desktop
6. Installation and working of Telnet (Terminal Network)
7. Switch configuration and management (Telnet, SNMP, HTTP)
8. Installation of Dynamic Host Configuration Protocol (DHCP)
9. To study DNS Server Case Study and to install DNS Server and its Configuration
10. Optical Fiber Splicing Machine experiment
11. Basic Firewall Configuration
12. Router configuration and management
13. Implement RSA asymmetric (public key and private key)-Encryption
14. Generate digital signature using Hash code and using MAC code

Reference Book(s)

1. W. Stallings, “Data and Computer Communications”, Prentice Hall of India.
2. B. A. Forouzan, “Data Communications and Networking”, McGraw Hill.
3. Tanenbaum, A.S. Computer Networks, Prentice Hall of India, New Delhi.