Computer Networking

Semester IV	Subject Code: BC41603	Lectures: 60

Objectives:

The course is designed to equip students with,
- An ability to understand of modern network architectures from a design and performance perspective
- The major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)
- The knowledge of network terminology
- The areas of Network Security

Unit 1: Basics of Computer Networks	10
- Computer Network - Definition - Goals - Applications - Structure - Components - Topology - Bus - Star - Ring - Mesh - Types of Networks - LAN, MAN, WAN, Internet - Broadcast & Point-To-Point Networks - Communication Types - Serial - Parallel - Modes of Communication : - Simplex - Half Duplex - Full Duplex - Server Based LANs & Peer-to-Peer LANs - Case Study	

Unit 2: Network Models	8

- Design issues of the layer
- Protocol Hierarchy
- ISO-OSI Reference Model :
  - Layers in the OSI Model
  - Functions of each layer
- Connection Oriented services
- Connectionless services
- Internet Model (TCP/IP)
- Comparison of ISO-OSI & TCP/IP Model
- Addressing
  - Physical Addresses
  - Logical Addresses
  - Port Addresses
- IP Addressing
- Classful addressing
- Classless addressing
- Case study

Unit 3: Transmission Media	10

- Guided Media(Wired) :
  - Coaxial Cable:- Physical Structure, Standards, BNC Connector, Applications
  - Twisted Pair :- Physical Structure, UTP vs STP, Connectors, Applications
  - Fiber Optics Cable :- Physical Structure, Connectors, Applications
- Unguided Media(Wireless)
  - Electromagnetic Spectrum For Wireless Communication
- Propagation Methods
  - Ground,
  - Sky,
- Line-Of-Sight
- Wireless Transmission
- Radio Waves
- Infra-Red,
- Micro-Wave
- Case study

Unit 4: Wired and Wireless LAN's	10

- IEEE Standards
  - Standard Ethernet
  - Fast Ethernet
  - Gigabit Ethernet
- Network Interface Cards(NIC)
  - Components of NIC
  - Functions of NIC
  - Types of NIC
- Wireless LAN
  - IEEE802.11 Architecture
  - MAC Sub layer
    - Frame Format
    - Frame Types
- Bluetooth (Architecture, Pico net and Scatter net)
- Case Study

Unit 5 :- Network Connectivity Devices	10

- Categories of Connectivity Devices
  - Passive & Active Hubs
  - Repeaters
  - Bridges
    - Transparent Bridges(Loop Problem, Spanning Tree)
    - Source Routing Bridges
  - Switches
  - Router
  - Gateways
- Network Security Devices
  - Firewalls
    - Packet-Filter firewall
    - Proxy firewall
  - Proxy server
    - Normal Proxy
    - Transparent Proxy
    - Reverse Proxy
- Case study

*Contact hours – 12 hours

Recommended Text Book:
1. *Computer Networking,* Vikas Tayade, Umakant Shrishetti, Nirali Prakashan, Nov.2014 2. *Computer Networking* , Alok Pawar, Tech-Max Publication , Dec.2014 3. *Computer Networking* , Dr.Ranjit Patil, Prof. Nandita Kulkarni, Success Publication 2014

Reference Books:
1. Andrew Tanenbum ,*Computer Networks*, VI Edition 2. Behrouz Ferouzan, *Data Communication & Networking*, III Edition 3. Prakash Gupta, *Data Communication & Computer Networking* March 2008 PHI