

Computer Networks-II

Semester VI

Subject Code: BS61703

Lectures: 60

Objectives:

The syllabus aims in equipping students with,

- To Understand wireless networks, its types and functionality of layer.
- To learn different types of addresses
- To Understand importance of network security and cryptography

Unit 1 : Wireless LANs	4
<ul style="list-style-type: none"> • IEEE 802.11 Architecture – Basic Service Set, Extended Service Set, Station Types and overview of layers • Bluetooth Architecture – Piconet, scatternet and overview of Bluetooth layers 	

Unit 2: Network layer	16
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2.1 The Network Layer

- Design Issues
 - Store-and-forward packet switching,
 - Services Provided to the Transport Layer
 - Comparison of Virtual Circuit and Datagram subnets
- Logical Addressing IPV4 Addresses :Address Space, Notations , Classful Addressing, Subnetting, Supernetting, Classless Addressing and Network Address Translation(NAT),
- IPV6 Addresses
- IPV4 Protocol: Datagram Format, Fragmentation, Checksum and Options
- Routing: Properties of routing algorithm,
 - Comparison of Adaptive and Non- Adaptive Routing Algorithms
- Congestion Control :Definition, Factors of Congestion, Difference between congestion control and flow control, General Principles of Congestion Control and Congestion Prevention Policies
- Network Layer Devices :Routers and Routing Tables

2.2 Address Mapping

- Protocol(ARP)-Cache Memory, Packet Format, Encapsulation, Operation, Four Different Cases and Proxy ARP
- RARP
- BOOTP
- DHCP – Static Address Allocation, Dynamic Address Allocation, Manual and automatic Configuration



Unit 3: Transport layer

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- Process-to-Process Delivery Client Server Paradigm, Multiplexing and De-multiplexing, Connectionless Vs Connection-Oriented Service, Reliable Vs Unreliable
- User Datagram Protocol(UDP)
 - Datagram Format
 - Checksum
 - UDP operations
 - Use of UDP
- Transmission Control Protocol (TCP)
 - TCP Services
 - TCP Features :Numbering System(Byte Number, Sequence Number, Acknowledgement Number) ,Flow Control,Error Control and Congestion Control
 - TCP Segment – Format

Unit 4: Application Layer

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- Domain Name System (DNS)
 - Name Space
 - Domain
 - Name Space,
- Distribution of Name Space,
- DNS in the Internet
- Resolution
- E-MAIL Architecture,
 - User Agent
 - Message Transfer Agent-SMTP
 - Message Access Agent-POP3, IMAP4
- File Transfer Protocol (FTP)
 - FTP components and connection
 - Anonymous FTP
- WWW Architecture, WEB Documents
- HTTP
 - HTTP Transaction
 - Persistent and Non persistent Connection
 - Proxy Server
- Devices
 - Gateways –Transport & Application Gateways



Unit 5: Network Security

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- Security Goal
 - Cryptographic attacks and terminology
- Security Services
 - Message-Confidentiality
 - Integrity
 - Non repudiation
 - Entity (User)- Authentication,
 - Message authentication
 - Digital signature.
- Message confidentiality
 - Confidentiality with Asymmetric-Key Cryptography,
 - Confidentiality with Symmetric-Key Cryptography
- Cryptography Encryption Model
 - Substitution Cipher
 - Transposition Cipher
 - RSA algorithm
- Security in the Internet
 - VPN
 - Firewalls
 - Protocols (Overview of IPSec,SSL/TLS)

***Contact hours – 12 hours**

Reference Books:

1. Andrew Tanenbaum ,'Computer Networks', Pearson Education.[4th Edition]
2. Behrouz Forouzan ,'Data Communication and Networking', TATA McGraw Hill. .[4th Edition]

