

| Networking Technology for Digital Devices | | | | |
|--|------------|---|--------------|--------------|
| CLASS S.E. (INFORMATION TECHNOLOGY) | | | | |
| SEMESTER IV | | | | |
| HOURS PER WEEK | LECTURES | : | 04 | |
| | TUTORIALS | : | -- | |
| | PRACTICALS | : | 02 | |
| | | | HOURS | MARKS |
| EVALUATION SYSTEM: | THEORY | | 3 | 100 |
| | PRACTICAL | | 3 | 25 |
| | ORAL | | - | 25 |
| | TERM WORK | | - | 25 |

Distributed Computing

Fundamentals, what is Distributed Computing? Evolution of DCS, DC System Models, Advantages and Disadvantages of DCS, Comparison with Centralized OS , Network Concepts for distributed Computing: Data Link Layer Protocol, Network Layer Protocol, Transport Layer Protocol, Application Layer Protocol, Protocols for Distributed Systems, ATM Technology, Message Passing, Inter Process Communication, Issues in IPC, Synchronization, Buffering, Multigram Messages, Encoding & Decoding of Message Data, Process Addressing, Failure Handling. Remote Procedure Calls, RPC Models, Transparency of RPC, Implementing RPC Mechanism, Stub Generation, RPC Messages, Marshalling Arguments & Results, Server Management, Communication Protocol for RPC's , Client-Server binding, Introduction to CORBA, CORBA Overview, BOA & POA Generation, Evaluating BOA & POA Generation, Lifecycle of a CORBA Invocation

(II)Management of Networks

Introduction, History of Network Developments, Network Hardware, Network Software, OSI Reference Model (7 Layers), TCP/IP Reference Model, Queuing - Markovian Process.

The Physical Layer. The Theoretical Basis for Data communication: Fourier Analysis, etc. Transmission Media, Narrowband ISDN, Modulation, Multiplexing, Packet Switching, Circuit switching

The Data Link Layer, Data Link Layer design issues, Error detection & correction, Elementary Data Link Protocols, X.25 Protocol, Sliding Window protocols,

Medium Access Sublayer, The channel Allocation Problem, ALOHA, Carrier Sense Multiple Access Protocols, Ethernet, Token bus and Token Ring (IEEE Standard 802 for LANs and MANs).

The Network Layer, Network Layer Design Issues, Routing, Types of Routing, Shortest Path Routing, General Principles of Congestion control, Network Layer in the Internet, The IP Protocol, IP Addresses, Subnets, Internet Control Protocols, OSPF, BGP

The Transport Layer, The TCP Service model, The TCP Protocol, The TCP Segment Header, TCP Connection Management, TCP Transmission Policy, TCP Congestion Control, Timer Management. The Application Layer, DNS, SNMP, SNMPv2

Network Management, Functions of Networks, Network Environments, Design Considerations, Performance, Monitoring, Fault Management, Maintenance, Security, Administration.

Recent Development in Network, Mobile Communication, Satellite Communication, Fiber Optics as a Communication Media ATM, Types of Services in ATM, Hubs, Gateways, Bridges etc,

Text Book

1. *Computer Networks, Andrew S. Tanenbaum, Pearson Education*
2. *Distributed Operating Systems, P.K. Sinha, IEEE Press*
3. Youlu Zheng / Shakil Akhtar, *Networks for computer scientists, Oxford University press*
4. *Distributed Operating Systems, Andrew S. Tanenbaum, Pearson Education*
5. Stallings, "Data and Computer Communication", Pearson Education
6. Douglas E. Comer, "Computer Networks and Internets" 4th ed, Pearson
7. Bertsekas and Gallager, "Data Networks" Pearson Education

Term Work

Term work shall consist of at least 10 experiments and one written test.

Distribution of marks for term work shall be as follows:

Marks

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| 1. Attendance (Theory and Practical) | 05 Marks |
| 2. Laboratory work (Experiments and Journal) | 10 Marks |
| 3. Test (at least one) | 10 Marks |

The final certification and acceptance of TW ensures the satisfactory performance of laboratory Work and Minimum Passing in the term work.

List of Experiments

1. program for client-server socket
2. program on Remote procedure call
3. Program for creating UDP Client/server and use it
4. program for Error detection & correction
5. program for finding shortest path using Dijkshtras Algorithm
6. Implementation of Bellman ford algorithm
7. Case Study on SNMP
8. Report (case study) CORBA technology
9. Implementation of Deffie-Hellman & RSA algorithm
10. Report on any advanced protocol.

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