4/4 B.Tech. FIRST SEMESTER

CS7T4B　　　　　　　　　　　　**NETWORK PROTOCOLS**　　　　　　　　**Credits: 4**

Elective – I

Lecture: 4 periods/week　　　　　　　　　　**Internal assessment: 30 marks**

Tutorial: 1 period /week　　　　　　　　　**Semester end examination: 70 marks**

Course Context and Overview: This course introduces and explains in some depth the principles, protocols, technologies, services and standards used for Internet networking.

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Prerequisite: Computer Networks

Objectives:

1. Understand the overview of the terminology and communication protocols, OSI model, some common data link protocols.
2. Explain the IP protocol (IPV4), Internet Control Message Protocol (ICMP).
3. Have a Overview of Multicast and the techniques used to distribute the messages using Internet Group Management Protocol(IGMP)
4. Explain the next generation of the Internet Protocol(IPV6)
5. Describe the concept of routing protocols like unicast protocols like Routing Information Protocol (RIP), Open Shortest Path First(OSPF).
6. Describe the extended protocols like Intermediate System to Intermediate System (IS-IS), Border Gateway Protocol (BGP) as well as multicast routing protocols.
7. Explain how services and features are built on top of IP using Differentiated Services, Integrated Services and Resource Reservation Protocol (RSVP).
8. Analyze the Transport Protocols which are responsible for end to end transmission across internet using Transmission Control Protocol, User Datagram Protocol, Streams Control Transmission Protocol (SCTP) and Real-Time Transport Protocol (RTP).

Learning Outcomes:

　　　Ability to:

1. Understand the working concept of OSI model data link layer protocols.
2. Distinguish the features of IPV4 and IPV6 in various scenarios.
3. Describe the routing protocols and choose the protocol for suitable applications.
4. Illustrate the functionality of various transport layer protocols.

UNIT I

Overview of Essentials: Physical Connectivity, Protocols and Addressing, The OSI SevenLayer Model, An Architecture for the Network, Packaging Data, Data Link Protocols: Ethernet, Token Ring, Asynchronous Transfer Mode, Packet over SONET, Dial up Networking,802.2 and Logical Link Control.

UNIT II

The Internet Protocol: Choosing to use IP, IPV4, IPV4 Addressing, IP in Use, IP Optionsand Advanced Functions, Internet Control Message Protocol (ICMP).

UNIT III

Multicast: Choosing Unicast or Multicast, Multicast Addressing and Forwarding, InternetGroup Management Protocol (IGMP).

UNIT IV

IP Version Six: IPV6 Addresses, Packet Formats, Options, Choosing Between IPV4 andIPV6

UNIT V

Routing Protocols 1: Routing and Forwarding, Distributing Routing Information,Computing Paths, Routing Information Paths, Open Shortest Path First.

UNIT VI

Routing Protocols 2: Intermediate System to Intermediate System (IS-IS), ChoosingBetween IS-IS and OSPF, Border Gateway Protocol 4, Multicast Routing, Other Routing Protocols.

UNIT VII

IP Service Management: Choosing how to manage Services, Differentiated Services,Integrated Services, Reserving Resources using RSVP.

UNIT VIII

Transport OverIP: What is a Transport Protocol, User Datagram Protocol (UDP),Transmission Control Protocol(TCP), Stream Control Transmission Protocol (SCTP), The Real -Time Transport Protocol(RTP)

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Learning Resources

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Text Book:

The Internet And Its Protocols (A Comparative Approach) by ADRIAN FARREL Morgan Kaufamann Elsevier 2004.