

Devi Ahilya University, Indore, India Institute of Engineering & Technology			MSc – I Year (Applied Mathematics) with Specialization in Computing & Informatics Semester- IV				
Subject Code & Name	Instructions Hours per Week			Credits			
AM4EC3: Computer Network/ Internet & Web Technology	L	T	P	L	T	P	Total
	3	1	-	3	1	-	4
Duration of Theory Paper: 3 Hours							

Learning Objectives:

- To provide an introduction to concepts of Computer Network
- To provide an understanding of its design issues as well as web technology.

Prerequisite(s): Communication System basics, Knowledge of Java Programming language (core).

COURSE OF CONTENTS

UNIT- I

Introduction: Overview, Goal and Applications of Computer Networks; Network Hardware -LAN, MAN, WAN and topologies; LAN components – File server, Workstations, Network Adapter Cards; Network Software - Protocol hierarchies, Design issues for the layers, Connection Oriented and Connection less services, Service primitives, Relationship between Services and Protocols; Switching Techniques – Circuit Switching and Packet Switching; Reference models – OSI and TCP/IP, comparison and critique of OSI and TCP/IP reference models.

UNIT- II

Data Link Layer: Design issues – Services, Framing, Error Control and Flow Control; Error Detection Techniques - Parity Check and Cyclic Redundancy Check (CRC); Error Correction Technique - Hamming code; Elementary Data Link Protocols - Unrestricted Simplex Protocol, Simplex Stop-and-Wait Protocol, Sliding Window Protocols : One-Bit Sliding Window Protocol, protocol using Go Back N and Selective Repeat; HDLC protocol; Data link layer in the Internet - SLIP and PPP.

UNIT- III

Network Layer: Internetworking: Concepts and Architecture. Routing: different routing algorithms, Congestion Control, Addressing- IP Addressing and subnet masking, CIDR , IPv6, IP protocol and other supporting protocols at IP layer: ARP, RARP, ICMP

Transport Layer: Transport Service; Elements of transport protocols - Addressing, Connection establishment, Connection release, Flow control and Buffering, Multiplexing; The Internet Transport Protocols - UDP and TCP, The TCP Service Model, The TCP Protocol.

Application layer: Client Server Architecture, DNS, WWW and HTTP, E-mail Protocols (SMTP, POP3, IMAP, MIME), FTP, TELNET. Overview of network security.

UNIT-IV

Introduction to HTTP, web Server and application Servers, Installation of Application servers, Config files, Web.xml. Java Servlet, Servlet Development Process, Deployment Descriptors, The Generic Servlet, Lifecycle of Servlet. Servlet Packages, Classes, Interfaces, and Methods, Handling Forms with Servlet.

UNIT -V

Various methods of Session Handling. Various elements of deployment descriptors. Java Database Connectivity: steps in process of connection to the database, types of JDBC Drivers. Introduction to Web Services, MVC Architecture, Struts and Hibernate.

Learning Outcomes:

Upon completing the course, students will be able to:

- Have a good understanding of the OSI Reference Model and in particular have a good knowledge of Layers.

- Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
- Have a basic knowledge of the use of cryptography and network security.
- Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols.
- Understand how the Internet works today.

BOOKS RECOMMENDED:

- [1] W.Stallings, Data and Computer Communications, Prentice-Hall, 5th Ed., 1997.
- [2] Conner Doughlous, Steven, Computer Networks and Internets, 5th Ed., Prentice-Hall, 2009.
- [3] A.S. Tanenbaum, Computer Network, 4th Ed., Pearson Education, 2007 .
- [4] D.E.Comer, Internetworking with TCP/IP Vol. I, 6th Pearson Education, 2013.
- [5] Umesh Kumar Singh, Internet and Web Technology, Images Publication, 2002.
- [6] Black Uyles, Computer Network, Prentice-Hall, 2nd Ed., 1993.