

## COMPUTER NETWORKS

<b>V Semester:</b> CSE (AI&ML)																				
Course Code	Category	Hours / Week			Credits	Maximum Marks														
AITC06	Core	L	T	P	C	CIA	SEE	Total												
		3	1	0	4	30	70	100												
<b>Contact Classes: 45</b>		<b>Total Tutorials: 15</b>		<b>Total Practical Classes: Nil</b>			<b>Total Classes: 60</b>													
<b>Prerequisite: There is no prerequisite to take this course</b>																				
<p><b>I. COURSE OVERVIEW:</b>            The main emphasis of this course is on the organization and management of local area networks (LANs) wide area networks (WANs). The course includes learning about computer network organization and implementation, obtaining a theoretical understanding of data communication and computer networks. Topics include layered network architectures, addressing, naming, forwarding, routing, communication reliability, the client-server model, and web and email protocols. The applications of this course are to design, implement and maintain a basic computer networks.</p> <p><b>II. COURSE OBJECTIVES:</b>            The students will try to learn:</p> <ul style="list-style-type: none"> <li>I How computer network hardware and software operate</li> <li>II Investigate the fundamental issues driving network design</li> <li>III The data transmission through protocols across the network in wired and wireless using routing algorithms.</li> </ul> <p><b>III. COURSE OUTCOMES:</b>  <b>After successful completion of the course, students should be able to:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">CO 1 <b>Outline the basic concepts of data communications including the key aspects of networking and their interrelationship, packet, circuit and cell switching as internal and external operations, physical structures, types, models, and internetworking</b></td> <td style="width: 20%;">Understand</td> </tr> <tr> <td>CO 2 <b>Make use of different types of bit errors and the concept of bitredundancy for error detection and error correction.</b></td> <td>Understand</td> </tr> <tr> <td>CO 3 <b>Identify the suitable design parameters and algorithms for assuring quality of service and internetworking in various internet protocols</b></td> <td>Understand</td> </tr> <tr> <td>CO 4 <b>Interpret transport protocols (TCP,UDP) for measuring the network performance</b></td> <td>Evaluate</td> </tr> <tr> <td>CO 5 <b>Illustrate the various protocols (FTP, SMTP, TELNET, EMAIL, and WWW) and standards (DNS) in data communications among network.</b></td> <td>Analyze</td> </tr> <tr> <td>CO 6 <b>Compare various networking models (OSI, TCP/IP) in terms of design parameters and communication modes.</b></td> <td>Analyze</td> </tr> </table> <p><b>IV. SYLLABUS:</b></p> <p><b>MODULE –I: INTRODUCTION (08)</b>            Introduction: Networks, network types, internet history, standards and administration; Network models: Protocol layering, TCP/IP protocol suite, the OSI model Transmission media: Introduction, guided media, unguided media; Switching: Introduction, circuit switched networks, packet switching.</p> <p><b>MODULE –II: DATA LINK LAYER (09)</b>            Introduction: Link layer addressing; Error detection and correction: Cyclic codes, checksum, forward error correction; Data link control: DLC services, data link layer protocols, media access control: Random access, virtual LAN.</p> <p><b>MODULE –III: NETWORK LAYER (10)</b>            Network layer design issues, routing algorithms, congestion control algorithms, quality of service, and internetworking.</p> <p>The network layer in the internet: IPv4 addresses, IPv6, internet control protocols, OSPF(Open Shortest Path First), IP (Internet Protocol).</p> <p><b>MODULE –IV: TRANSPORT LAYER (09)</b>            The transport service, elements of transport protocols, congestion control; The internet transport protocols: UDP (User Datagram Protocol), TCP (Transport Control Protocol), performance problems in computer networks, network performance measurement.</p>									CO 1 <b>Outline the basic concepts of data communications including the key aspects of networking and their interrelationship, packet, circuit and cell switching as internal and external operations, physical structures, types, models, and internetworking</b>	Understand	CO 2 <b>Make use of different types of bit errors and the concept of bitredundancy for error detection and error correction.</b>	Understand	CO 3 <b>Identify the suitable design parameters and algorithms for assuring quality of service and internetworking in various internet protocols</b>	Understand	CO 4 <b>Interpret transport protocols (TCP,UDP) for measuring the network performance</b>	Evaluate	CO 5 <b>Illustrate the various protocols (FTP, SMTP, TELNET, EMAIL, and WWW) and standards (DNS) in data communications among network.</b>	Analyze	CO 6 <b>Compare various networking models (OSI, TCP/IP) in terms of design parameters and communication modes.</b>	Analyze
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**MODULE-V: APPLICATION LAYER(09)**

Introduction, client server programming, WWW (World Wide Web) and HTTP (Hyper Text Transfer Protocol), FTP (File Transfer Protocol), E-mail, telnet, DNS (Domain Naming System), SNMP (Simple Network Management Protocol).

**V. TEXT BOOKS:**

1. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, 5<sup>th</sup> Edition, 2012.
2. Andrew S. Tanenbaum, David.j.Wetherall, "Computer Networks", Prentice-Hall, 5<sup>th</sup> Edition, 2010.

**VI. Reference Books:**

1. Douglas E. Comer, "Internetworking with TCP/IP ", Prentice-Hall, 5<sup>th</sup> Edition, 2011.
2. Peterson, Davie, Elsevier, "Computer Networks", 5<sup>th</sup> Edition,2011
3. Comer, "Computer Networks and Internets with Internet Applications", 4<sup>th</sup> Edition, 2004.

**VII. WEB REFERENCES:**

1. <http://computer.howstuffworks.com/computer-networking-channel.htm>
2. <https://www.geeksforgeeks.org/layers-osi-model/>
3. [https://www.wikilectures.eu/w/Computer\\_Network](https://www.wikilectures.eu/w/Computer_Network)
4. <https://technet.microsoft.com/en-us/network/default.aspx>