Course Code	**18CIPC501**					
Category	Engineering Science Courses : Professional Core					
Course title	**COMPUTER NETWORKS - THEORY**					
Scheme and Credits	No. of Hours/Week					Semester - V CSE/ISE
	L	T	P	SS	Credits	
	4	0	0	0	4	
CIE Marks: 50	SEE Marks: 50		Total Max. Marks: 100			Duration of SEE: 03 Hours
Prerequisites (if any): NIL						

COURSE OBJECTIVES:

The course will enable the students to

1. Get the idea of choosing the required functionality at each layer for a given application and Trace the flow of information from one node to another node in the network.
2. Understand the division of network functionalities into layers.
3. Learn the component required to build different types of networks and identify the solution for the functionalities in each layer.
4. Learn the working and functions of various protocols of all the layers.
5. Design a basic web page.

UNIT I: PHYSICAL LAYER **10 Hours**

Introduction: Uses of Computer Network, Network Hardware and Network Software, Reference Models. Physical Layer: Guided Transmission, Wireless Transmission, Digital Modulation and Multiplexing, Public Switched Telephone Network.

UNIT II: DATALINK LAYER **10 Hours**

Issues, Error Detection and Correction, Elementary Datalink Protocol, Sliding Window Protocol. Medium Access Control Sublayer: Channel Allocation Problem, Multiple Access Protocol, Ethernets, Datalink Layer Switching.

UNIT III: NETWORK LAYER **10 Hours**

Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of service, Internetworking, Network layer in the Internet-IPv4, IPv6.

UNIT IV: TRANSPORT LAYER **09 Hours**

Transport service, Elements of Transport Protocols, Congestion Control, Internet Transport Protocol- UDP, TCP.

UNIT V: APPLICATION LAYER **09 Hours**

DNS, Electronic Mail, World Wide WEB.

TEXT BOOKS:

1. Computer Networks, Andrew S Tannenbaum and David J Wetherall, Pearson, 5th edition, 2014.

2. Behrouz A Forouzan, Data and Communications and Networking, Fifth Edition, McGraw Hill, Indian Edition, 2013.

REFERENCE BOOKS:

1. Larry L Peterson and Brusce S Davie, Computer Networks, fifth edition, ELSEVIER.
2. Computer Networking-A Top-Down approach, James F Kurose, Keith W Ross, 5th edition, Pearson, 2016.
3. Mayank Dave, Computer Networks, Second edition, Cengage Learning.

e-BOOKS/ONLINE RESOURCES:

1. http://freecomputerbooks.com/networkComputerBooks.html.
2. https://www.pdfdrive.com/computer-networking-books.html.

MOOCs:

1. https://www.coursera.org/courses?query=computer%20network.
2. https://www.quora.com/Which-is-the-online-course-to-learn-computer-networks.
3. https://in.udacity.com/course/computer-networking--ud436.
4. https://swayam.gov.in/courses/5172-computer-networks.

COURSE OUTCOMES:

The students at the end of the course, will be able to

CO1: Analyze the need of for different protocols in data link layer and network layer of TCP/IP protocol suite.

CO2: Design network using internetworking concepts and related protocol by analysing the need for various routing protocols in different scenarios.

CO3: Apply the various routing algorithms for effective communication and congestion control algorithms to manage the network traffic.

CO4: Classify routers, IP and Routing Algorithms in network layer.

CO5: Design a web page and acquire the knowledge of working of DNS and Email.

SCHEME OF EXAMINATION:

<table>
<tr><td rowspan="2">CIE – 50 Marks</td><td>Test I (Any Three Units) - 20 Marks</td><td>Quiz I – 5 Marks</td><td>25 Marks</td><td rowspan="2">Total: 50 Marks</td></tr>
<tr><td>Test II (Remaining Two Units) - 20 Marks</td><td>Quiz II – 5 Marks</td><td>25 Marks</td></tr>
<tr><td rowspan="3">SEE – 100 Marks</td><td colspan="2">Q1 (Compulsory): MCQs or Short answer type questions for 15 Marks covering entire syllabus.</td><td>15 Marks</td><td rowspan="3">Total: 100 Marks</td></tr>
<tr><td colspan="2">Q2 & Q3 from Units which have 09 Hours are compulsory.</td><td>17 * 2 = 34 Marks</td></tr>
<tr><td colspan="2">Q4 or Q5, Q6 or Q7 and Q8 or Q9 from Units which have 10 Hours shall have Internal Choice.</td><td>17 * 3 = 51 Marks</td></tr>
</table>

Note: SEE shall be conducted for 100 Marks and the Marks obtained is scaled down to 50 Marks.

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