

<b>DATA COMMUNICATION</b> [As per Choice Based Credit System (CBCS) scheme] (Effective from the academic year 2016 -2017) <b>SEMESTER – IV</b>			
Subject Code	15CS46	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03
CREDITS – 04			
<b>Course objectives:</b> This course will enable students to <ul style="list-style-type: none"> <li>Comprehend the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.</li> <li>Explain with the basics of data communication and various types of computer networks;</li> <li>Illustrate TCP/IP protocol suite and switching criteria.</li> <li>Demonstrate Medium Access Control protocols for reliable and noisy channels.</li> <li>Expose wireless and wired LANs along with IP version.</li> </ul>			
Contents			Teaching Hours
<b>Module 1</b>			
<b>Introduction:</b> Data Communications, Networks, Network Types, Internet History, Standards and Administration, <b>Networks Models:</b> Protocol Layering, TCP/IP Protocol suite, The OSI model, <b>Introduction to Physical Layer-1:</b> Data and Signals, Digital Signals, Transmission Impairment, Data Rate limits, Performance, <b>Digital Transmission:</b> Digital to digital conversion (Only Line coding: Polar, Bipolar and Manchester coding).			10 Hours
<b>Module 2</b>			
<b>Physical Layer-2:</b> Analog to digital conversion (only PCM), Transmission Modes, <b>Analog Transmission:</b> Digital to analog conversion, <b>Bandwidth Utilization:</b> Multiplexing and Spread Spectrum, <b>Switching:</b> Introduction, Circuit Switched Networks and Packet switching.			10 Hours
<b>Module 3</b>			
<b>Error Detection and Correction:</b> Introduction, Block coding, Cyclic codes, Checksum, Forward error correction, <b>Data link control:</b> DLC services, Data link layer protocols, HDLC, and Point to Point protocol (Framing, Transition phases only).			10 Hours
<b>Module 4</b>			
<b>Media Access control:</b> Random Access, Controlled Access and Channelization, <b>Wired LANs Ethernet:</b> Ethernet Protocol, Standard Ethernet, Fast Ethernet, Gigabit Ethernet and 10 Gigabit Ethernet, <b>Wireless LANs:</b> Introduction, IEEE 802.11 Project and Bluetooth.			10 Hours
<b>Module 5</b>			
<b>Other wireless Networks:</b> WIMAX, Cellular Telephony, Satellite networks, <b>Network layer Protocols :</b> Internet Protocol, ICMPv4, Mobile IP, <b>Next generation IP:</b> IPv6 addressing, The IPv6 Protocol, The ICMPv6 Protocol and Transition from IPv4 to IPv6.			10 Hours
<b>Course Outcomes:</b> After studying this course, students will be able to <ul style="list-style-type: none"> <li>Illustrate basic computer network technology.</li> <li>Identify the different types of network topologies and protocols.</li> <li>Enumerate the layers of the OSI model and TCP/IP functions of each layer.</li> <li>Make out the different types of network devices and their functions within a network</li> </ul>			

<ul style="list-style-type: none"> <li>Demonstrate the skills of subnetting and routing mechanisms.</li> </ul>
<b>Graduate Attributes</b>
<ol style="list-style-type: none"> <li>Engineering Knowledge</li> <li>Design Development of solution(Partly)</li> <li>Modern Tool Usage</li> <li>Problem Analysis</li> </ol>
<b>Question paper pattern:</b>
<p>The question paper will have ten questions.  There will be 2 questions from each module.  Each question will have questions covering all the topics under a module.  The students will have to answer 5 full questions, selecting one full question from each module.</p>
<b>Text Book:</b>
<p>Behrouz A. Forouzan, Data Communications and Networking 5E, 5<sup>th</sup> Edition, Tata McGraw-Hill, 2013. (Chapters 1.1 to 1.5, 2.1 to 2.3, 3.1, 3.3 to 3.6, 4.1 to 4.3, 5.1, 6.1, 6.2, 8.1 to 8.3, 10.1 to 10.5, 11.1 to 11.4, 12.1 to 12.3, 13.1 to 13.5, 15.1 to 15.3, 16.1 to 16.3, 19.1 to 19.3, 22.1 to 22.4)</p>
<b>Reference Books:</b>
<ol style="list-style-type: none"> <li>Alberto Leon-Garcia and Indra Widjaja: Communication Networks - Fundamental Concepts and Key architectures, 2nd Edition Tata McGraw-Hill, 2004.</li> <li>William Stallings: Data and Computer Communication, 8th Edition, Pearson Education, 2007.</li> <li>Larry L. Peterson and Bruce S. Davie: Computer Networks – A Systems Approach, 4th Edition, Elsevier, 2007.</li> <li>Nader F. Mir: Computer and Communication Networks, Pearson Education, 2007</li> </ol>

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**H.O.D.**

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