

Course Code	PCS21C03J	Course Name	COMPUTER NETWORKS	Course Category	C	Professional Core Course	L	T	P	C
							3	0	4	5

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards			

Course Learning Rationale (CLR):		The purpose of learning this course is to,	Learning			Program Learning Outcomes (PLO)														
CLR-1 :	Understand the evolution of computer networks using the layered network architecture		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	Understand the addressing concepts and learn networks devices		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Disciplinary Knowledge	Critical Thinking	Problem Solving	Analytical Reasoning	Research Skills	Team Work	Scientific Reasoning	Reflective Thinking	Self-Directed Learning	Multicultural Competence	Ethical Reasoning	Community Engagement	PSO 1	PSO 2	PSO 3
CLR-3 :	Design computer networks using subnetting and routing concepts																			
CLR-4 :	Understand the error types , framing, flow control																			
CLR-5 :	Understand the various Medium Access Control techniques and also the characteristics of physical layer functionalities																			
CLR-6 :	Understand basic network administration																			
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:																		
CLO-1 :	Acquire the basics of computer network and its architecture		3	80	70	L	H	H	H	H	M	-								
CLO-2 :	Acquire the knowledge of various networks devices and addressing methods		3	85	75	M	M	H	H	H	-	-								
CLO-3 :	Ability to design the network routing methods		3	75	70	M	M	H	H	H	-	-								
CLO-4 :	Acquire the various error codes and framing concepts		3	85	80	L	L	H	H	H	M	-								
CLO-5 :	Ability to understand the physical layer functions and components		3	75	70	H	H	H	H	H	L	-								
CLO-6 :	Ability to design a computer network using a switch and router		3	85	80	L	H	H	H	H	H	-								

Duration (hour)	21	21	21	21	21
S-1	SLO-1 A Communications Model	Transmission Terminology	Asynchronous Transmission	Frequency Division Multiplexing Synchronous	Local Area Network Overview- Background
	SLO-2 A Data Communications Model- Networks	Frequency, Spectrum, And Bandwidth	Synchronous Transmission	Time Division Multiplexing	Topologies And Transmission Media
S-2	SLO-1 Operation of TCP and IP	Data And Signals- -	Error Correction-	Circuit-Switching Networks	IEEE 802 Reference Model
	SLO-2 TCP	Analog And Digital Transmission	Block Code Principles	Circuit-Switching Concepts	Logical Link Control- LLC-
S-3	SLO-1 UDP Overview	Transmission Impairments	Flow Control	Packet-Switching Principles	Protocol- BRIDGES
	SLO-2 TCP/IP Applications	Attenuation And Attenuation Distortion	Stop-And-Wait Flow Control	Advantage of Packet Switching	Functions Of A Bridge
S 4-7	SLO-1 Laboratory 1: Familiarization with configuring and installing a LAN using packet tracer	Laboratory 4: To study different types of transmission media	Laboratory 7: Error Detecting Code Using CRC-CCITT (16-bit)- Java /C/C++ Program	Laboratory 10: Study of switches, bridges using Cisco packet tracer	Laboratory 13: Designing various topologies using cisco packet tracer
	SLO-2				
S-8	SLO-1 The OSI Model	Delay Distortion	Stop-And-Wait Flow Control Delay Distortion	Comparison Of Circuit Switching And Packet Switching,X.25	Fixed Routing- The Spanning Tree Approach- Frame Forwarding-
	SLO-2 Role play and activity based learning for understanding OSI model, Standardization within a Protocol	Noise, Guided Transmission Media	Error Control	Frame Relay- Background	Electronic Mail

Duration (hour)		21	21	21	21	21
S-9	SLO-1	Architecture - Standardization within the OSI Framework, Service Primitives and	Twisted Pair-Physical Description-Applications-Unshielded And Shielded Twisted Pair	Stop-And-Wait ARQ	Frame Relay Protocol Architecture-User Data Transfer	SMTP And MIME- Simple Mail Transfer Protocol (SMTP)
	SLO-2	Parameters- Traditional Internet-Based Applications Multimedia-Media Types	Coaxial Cable- Physical Description-Applications-Transmission Characteristics	Go-Back-N ARQ HDLC	Routing In Switched Networks	Basic Electronic Mail Operation
S-10	SLO-1	Multimedia Applications, Standardization within a Protocol	Optical Fiber- Physical Description Applications-Transmission Characteristics	High-Level Data Link Control (HDLC)	Routing Strategies	SMTP Overview- Connection Setup-
	SLO-2	Architecture Standardization within the OSI Framework	Noise- Guided Transmission Media Wireless Transmission	Basic Characteristics Frame Structure	Fixed Routing Flooding	Mail Transfer
S 11-14	SLO-1	Laboratory 2: Experimenting with network protocols for achieving communication between computers using packet tracer	Laboratory 5: Interconnection software for communication between two different network architectures-using packet tracer	Laboratory 8: Case study submission for: Sliding-Window Flow Control & Stop-And-Wait Flow Control	Laboratory 11: To configure network security using two routers by blocking ICMP ping request.-CISCO packet tracer	Laboratory 14 :To configure Internet Access/Implementation using CISCO packet tracer
	SLO-2					
S-15	SLO-1	Service Primitives Parameters	Antennas-Transmission Media control	Address Field- Data Field	Random Routing Switched Networks	Multipurpose Internet Mail Extensions (MIME) Benefits MIME
	SLO-2	Internet based	Wireless connection	Basic Characteristics data	Example	Advantage MIME
S-16	SLO-1	Traditional Internet-Based Applications	Terrestrial Microwave- Physical Description-Applications	Control Field	Adaptive Routing	Messages transmission
	SLO-2	Introduction of network layers	Feature of Optical Fiber	Error - detection	Hub, switch	Request Messages
S-17	SLO-1	OSI reference model	Feature of Transmission Media	Error Correction- code	Repeater	Response Messages
	SLO-2	Layers in the OSI Model, Comparison of Layers	Advantage coaxial cable	Over view of Frame work Advantage frame work	Gateway routers	Protocol Architecture Bridge Protocol Architecture
S 18-21	SLO-1	Laboratory 3: Creating a LAN using packet tracer	Laboratory 6: Using packet tracer to connect a network with different types of media connection	Laboratory 9: SIMULATION OF STOP AND WAIT PROTOCOL using NS/2 or any other tool	Laboratory 12: Case study submission for routing	Laboratory 15: Web programming using HTML
	SLO-2					

Learning Resources	1. "Data And Computer Communications" - William Stallings -Eighth Edition	3. "Data Communications and Networking" Behrouz A. Forouzan, "5th edition, July 1, 2010, ISBN: 9780073376226
	2. Behrouz A. Forouzan, (2010), "Data Communications and Networking", 5th Edition	4. William Stallings, (2010), "Data and Computer Communications", Ninth Edition

Learning Assessment											
Bloom's Level of Thinking		Continous Learning Assessment(50% Weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4# (10%)			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
	Create										
	Total	100 %		100 %		100 %		100 %		100%	

CLA – 4 can be from any combination of these: Assignments, Seminars, Scientific Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications etc.,

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr. S. Karthik, Assistant Consultant, Tata Consultancy Services	Dr. S. Sasikala, Associate Professor and Head, Dept. of Computer Science, University of Madras	Dr. Sabeen
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