Course Code	PCA20C05J	Course Name	COMPUTER NETWORKS	Course Category	C	Professional Core Course	L	T	P	C
							3	0	2	4

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

Course Learning Rationale (CLR):	The purpose of learning this course is to,

CLR-1 :	*Understand the evolution of computer networks using the layered network architecture*
CLR-2 :	*Understand the addressing concepts and learn networks devices*
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:	Learning Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	*Acquire the basics of computer network and its architecture*	*3*	*80*	*70*
CLO-2 :	*Acquire the knowledge of various networks devices and addressing methods*	*3*	*85*	*75*
CLO-3 :	*Abilty to design the network routing methods*	*3*	*75*	*70*
CLO-4 :	*Acquire the various error codes and framing concepts*	*3*	*85*	*80*
CLO-5 :	*Ability to understand the physical layer functions and components*	*3*	*75*	*70*
CLO-6 :	*Ability to design a computer network using a switch and router*	*3*	*85*	*80*

Program Learning Outcomes (PLO)														
1 Disciplinary Knowledge	2 Critical Thinking	3 Problem Solving	4 Analytical Reasoning	5 Research Skills	6 Team Work	7 Scientific Reasoning	8 Reflective Thinking	9 Self-Directed Learning	10 Multicultural Competence	11 Ethical Reasoning	12 Community Engagement	13 ICT Skills	14 Leadership Skills	15 Life Long Learning
L	*H*	*H*	*H*	*H*	*M*	*-*	*H*	*M*	*H*	*-*	*H*	*H*	*-*	*M*
M	*M*	*H*	*H*	*H*	*-*	*-*	*M*	*M*	*M*	*-*	*H*	*M*	*-*	*L*
M	*M*	*H*	*H*	*H*	*-*	*-*	*M*	*M*	*L*	*-*	*H*	*M*	*-*	*H*
L	*L*	*H*	*H*	*H*	*M*	*-*	*M*	*L*	*H*	*M*	*H*	*M*	*-*	*-*
H	*H*	*H*	*H*	*H*	*L*	*-*	*M*	*H*	*L*	*L*	*H*	*-*	*L*	*-*
L	*H*	*H*	*H*	*H*	*H*	*-*	*M*	*M*	*L*	*H*	*H*	*-*	*L*	*-*

Duration (hour)		15	15	15	15	15
S-1	SLO-1	A Communications Model	*Transmission Terminology*	*Asynchronous Transmission*	*Frequency Division Multiplexing*	*Local Area Network Overview- Background*
	SLO-2	A Data Communications Model-Networks	*Frequency, Spectrum, And Bandwidth*	*Synchronous Transmission*	*Synchronous Time Division Multiplexing*	*Topologies And Transmission Media*
S-2	SLO-1	The Need For A Protocol Architecture	*Analog And Digital Data Transmission*	*Types Of Errors*	*Statistical Time Division Multiplexing*	*Bus And Tree Topologies- Ring Topology- Star Topology*
	SLO-2	The TCP/IP Protocol Architecture	*Analog And Digital Data- Analog And Digital Signals*	*Parity Check- Cyclic Redundancy Check (CRC)*	*Circuit Switching And Packet Switching- Switched Communications Networks*	*Choice Of Topology - Choice Of Transmission Medium*

S-3	SLO-1	Operation of TCP and IP	*Data And Signals- Analog And Digital Transmission-*	*Error Correction- Block Code Principles*	*Circuit-Switching Networks*	*IEEE 802 Reference Model*
	SLO-2	TCP and UDP	*Transmission Impairments*	*Flow Control*	*Circuit-Switching Concepts- Packet-Switching Principles*	*Logical Link Control- LLC Protocol- BRIDGES- Functions Of A Bridge- Bridge Protocol Architecture*
S-4to S-5	SLO-1 SLO-2	*Lab!:Familiarization with configuring and installing a LAN using packet tracer*	*Lab4: To study different types of transmission media*	Lab7: Error Detecting Code Using CRC-CCITT (16-bit)-Java /C/C++ Program	Lab10:Study of switches, bridges using Cisco packet tracer	Lab 13: Designing various topologies using cisco packet tracer
S-6	SLO-1	*TCP/IP Applications*	*Attenuation And Attenuation Distortion*	*Stop-And-Wait Flow Control*	*Comparison Of Circuit Switching And Packet Switching*	*Fixed Routing- The Spanning Tree Approach-*
S-7	SLO-1	*The OSI Model*	*Delay Distortion*	*Sliding-Window Flow Control*	*X.25*	*Frame Forwarding-*
	SLO-2	*Role play and activity based learning for understanding OSI model*	*Noise*	*Error Control*	*Frame Relay- Background*	*Electronic Mai*
S-8	SLO-1	*Standardization within a Protocol Architecture - Standardization within the OSI Framework*	*Guided Transmission Media*	*Stop-And-Wait ARQ*	*Frame Relay Protocol Architecture-*	*SMTP And MIME-*
	SLO-2	*Service Primitives and Parameters- Traditional Internet-Based Applications*	*Twisted Pair-Physical Description-Applications-Unshielded And Shielded Twisted Pair*	*Go-Back-N ARQ*	*User Data Transfer*	*Simple Mail Transfer Protocol (SMTP)*
S-9 to S-10	SLO-1 SLO-2	*Lab2:Experimenting with network protocols for achieving communication between computers using packet tracer*	*Lab 5: Interconnection software for communication between two different network architectures- using packet tracer*	Lab 8: Case study submission for: Sliding-Window Flow Control & Stop-And-Wait Flow Control	*Lab 11:To configure network security using two routers by blocking ICMP ping request.- CISCO packet tracer*	*Lab 14 :To configure Internet Access/Implementation using CISCO packet tracer*
S-11	SLO-1	*Multimedia-Media Types*	*Coaxial Cable- Physical Description-Applications- Transmission Characteristics*	*HDLC*	*Routing In Switched Networks*	*Basic Electronic Mail Operation-*
	SLO-2	*Multimedia Applications*	*Optical Fiber- Physical Description Applications-Transmission Characteristics*	*High-Level Data Link Control (HDLC)*	*Routing Strategies*	*SMTP Overview-*
S-12	SLO-1	*Standardization within a Protocol Architecture*	Noise- Guided Transmission Media	*Basic Characteristics*	*Fixed Routing*	*Connection Setup-*
	SLO-2	*Standardization within the OSI Framework*	Wireless Transmission-	*Frame Structure*	*Flooding*	*Mail Transfer*
S-13	SLO-1	*Service Primitives and Parameters*	Antennas-	Address Field-	Random Routing	*Multipurpose Internet Mail Extensions (MIME)*

	SLO-2	*Traditional Internet-Based Applications*	Terrestrial Microwave- Physical Description-Applications	Control Field	Adaptive Routing	Request Messages- Response Messages
S-14 to S-15	SLO-1 SLO-2	*Lab 3:Creating a LAN using packet tracer*	*Lab 6: Using packet tracer to connect a network with different types of media connection*	Lab 9: SIMULATION OF STOP AND WAIT PROTOCOL using NS/2 or any other tool	*Lab 12: Case study submission for routing*	*Lab15 :Web programming using HTML*

Learning Resources	1. "Data And Computer Communications" - William Stallings -Eighth Edition 2. "DataCommunicationsandNetworking"BehrouzA.Forouzan,"5thedition,July1,2010,ISBN:9780073376226.

Learning Assessment

Level	Bloom's Level of Thinking	Continuous 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 Understand	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
Level 2	Apply Analyze	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Level 3	Evaluate Create	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
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