Ramgarhia Polytechnic College, Phagwara

Electronics and Communication Engineering Department

Head of Department: Er. Simranjit Singh Kahlon

Name of the Faulty: Er. Sangita Salhan

Discipline: ECE Department

Semester: 5th

Subject: Computer Networks

Lesson Plan Duration: 16 Weeks

RATIONALE

The future of computer technology is in computer networks. Global connectivity can be achieved through computer networks. A diploma holder in electronics and communication engineering should therefore understand the function of networks. Knowledge about hardware and software requirements of networks is essential.

Course Outcomes

After completion of the course, the learner should be able to

CO1. Recognize the physical topology and cabling (coaxial, OFC,   UTP, STP) of a network

CO2. Recognize various types of connectorsRJ-45, RJ-11,BNC and SCST

CO3. Demonstrate various types of networking models and protocol   suites

CO4. Install and configure a network interface card in a workstation

CO5. Identify the IP address of a workstation and the class of the   address and configure the IP Address on a workstation

CO6. Configure the routers

CO7. Demonstrate sub netting of IP address

CO8. Identify connectivity troubleshooting using PING, IPCONFIG, IFCONFIG

CO9. Explain concepts of wireless networking

PO ⟹ CO ⬇	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1		🚩		🚩			
CO2		🚩		🚩			
CO3		🚩					
CO4			🚩			🚩	
CO5		🚩	🚩				
CO6			🚩				
CO7			🚩	🚩			

CO8		🚩				
CO9	🚩					

Syllabus

Units	Details	Hours
1.	Networks Basics What is network Peer-to –peer Network Server Client Network LAN, MAN and WAN Network Services Topologies Switching Techniques	(06 hrs)
2.	OSI Model - Standards - OSI Reference Model - OSI Physical layer concepts - OSI Data-link layer concepts - OSI Networks layer concepts - OSI Transport layer concepts - OSI Session layer concepts - OSI presentation layer concepts - OSI Application layer concepts	(08 hrs)
3.	Introduction to TCP/IP Concept of physical and logical addressing Different classes of IP addressing, special IP address Sub netting and super netting Loop back concept IPV4 and IPV6 packet Format	(07 hrs)

	Configuring IPV4 and IPV6	
4.	Cables and Connectors Types of Cables(Coaxial, Twisted Pair), Shielded and Unshielded Pair of Cables (Straight wire Cable, CrossOver Cables) with colour coding. Ethernet Specification and Standardization: 10 Mbps (Traditional Ethernet), 100 Mbps (Fast Ethernet) and 1000 Mbps (Gigabit Ethernet),Leased lines. Use of RJ45, RJ11, BNC,SCST.	(06 hrs)
5.	Network Connectivity Network connectivity Devices NICs Hubs Repeaters Switches Routers and Routing Protocols. Configuring of Routers. VOIP and Net-to-Phone Telephony	(6 hrs)
6.	Network Administration / Security Client/Server Technology Server Management RAID management and mirroring Cryptography Ethical Hacking	(06 hrs)
7.	Network Trouble Shooting Techniques Trouble Shooting process Trouble Shooting Tools: PING,IPCONFIG, IFCONFIG, NETSTAT, TRACEROOT, Wiresharp/ Dsniffer/ Pcop	(05hrs)

8.	Wireless Networking	(04 hrs)
	Basics of Wireless: Wireless MAN, Networking, Wireless LAN, Wi-Fi, WiMax (Broad-band Wireless) and Li-Fi.	

LIST OF PRACTICALS

1. Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network.

2. Recognition and use of various types of connectors RJ-45, RJ-11,BNC and SCST

3. Making of cross cable and straight cable.

4. Install and configure a network interface card in a workstation.

5. Identify the IP address of a workstation and the class of the address and configure theIP Address on a workstation

6. Configuring of router using simulator (Example - Cisco Packet Tracer).

7. Study and demonstration of sub netting of IP address

8. Use of Netstat and its options.

9. Connectivity troubleshooting using PING, IPCONFIG, and IFCONFIG

10. Configuring of IP addresses using simulator (Example - Cisco Packet Tracer).

Reference Books:

1. Computer Networks by Tanenbaum, Prentice Hall of India, New Delhi
2. Data Communications and Networking by Forouzan, (Edition 2nd and 4th),Tata McGraw Hill Education Pvt Ltd , New Delhi
3. Data and Computer Communication by William Stallings, Pearson Education, New Delhi
4. Local Area Networks by Peter Hudson
5. Understanding Local Area Network by Neil Jenkins
6. Area Networks by Stan Schatt, Prentice Hall of India, New Delhi
7. Network+ Lab manual,- BPB Publications -by Tami Evanson
8. Networking Essentials – BPB Publications New Delhi
9. Computer Network and Communications By V.K. Jain and Narija Bajaj, Cyber Tech Publications, New Delhi.

10. Linux – The complete Reference by Richard Peterson, Tata McGraw Hill Education Pvt Ltd, New Delhi.
11. Linux – Install and Configuration Black Book by Dee Annleblanc and Issac Yates, IDG Books India Private Limited, Delhi.
12. Computer Network by J.S. Katre, Tech-Max Publication, Pune

Delivery/Instructional Methodologies

Sr.No.	Description
1.	Chalk and Talk
2.	PowerPoint Presentation

Assessment Methodologies

Sr. No.	Description	Type
1.	Student Assignment	Direct
2.	Test	Direct
3.	Board Examination	Direct
4.	Student Feedback	Direct

Gaps in the syllabus - to meet industry/profession requirements

S.NO.	DESCRIPTION	PROPOSED ACTIONS	PO MAPPING
	N/A	N/A	N/A

Topics beyond syllabus/advanced topics

Units	Details	Hours
N/A	N/A	N/A

Web Source References

Sr. No.	URL
1.	

Lesson Plan

Week	Theory		Practical	
	Lecture Day		Practical Day	
1st	1st	Networks Basics	1.	1. Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network.
	2nd	What is network Peer-to –peer Network Server Client Network LAN, MAN and WAN		
	3rd			
2nd	4th	Network Services	2.	Revision 1st Practical
	5th	Topologies		
	6th	Switching Techniques		

3rd	7th	OSI Model Standards OSI Reference Model OSI Physical layer concepts OSI Data-link layer concepts	3.	2. Recognition and use of various types of connectors RJ-45, RJ-11,BNC and SCST
	8th			
	9th	**SEMINAR**		
4th	10th	OSI Networks layer concepts OSI Transport layer concepts OSI Session layer concepts OSI presentation layer concepts OSI Application layer concepts	4.	Revision 2nd Practical
	11th			
	12th			
5th	13th	Introduction to TCP/IP Concept of physical and logical addressing Different classes of IP addressing, special IP address	5.	3. Making of cross cable and straight cable.
	14th			
	15th			
	16th	**REVISION**		Revision 3rd Practical
	17th	**PTM**	6.	

6th	18th	**1st Sessional Test (Tentative)**		
7TH	19th	Sub netting and super netting Loop back concept	7.	4. Install and configure a network interface card in a workstation.
	20th	IPV4 and IPV6 packet Format		
	21th	Configuring IPV4 and IPV6		
8th	22th	Cables and Connectors Types of cables, Straight wire Cable, CrossOver Cables) with colour coding.	8.	Revision 4th Practical
	23th			
	24th			
9th	25th	Ethernet Specification and Standardization: 10 Mbps (Traditional Ethernet), 100 Mbps (Fast Ethernet) and 1000 Mbps ,Leased lines. Use of RJ45, RJ11, BNC,SCST.	9.	5. Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation
	26th			
	27th			

10th	28th	Network Connectivity Network connectivity Devices NICs Hubs	10.	Revision 5th Practical
	29th			
	30th			
11th	31st	Repeaters Switches Routers and Routing Protocols. Configuring of Routers. VOIP and Net-to-Phone Telephony	11.	6. Configuring of router using simulator (Example - Cisco Packet Tracer).
	32nd			
	33th			
12th	34th	**REVISION**	12.	Revision 6th Practical
	35th	**PTM**		
	36th	**2nd Sessional Test (Tentative)**		
	37th	Network Administration / Security Client/Server Technology Server Management RAID management and mirroring Cryptography Ethical Hacking	13.	7. Study and demonstration of sub netting of IP address
	38th			

13th	39th			
14th	40th	Network Trouble Shooting Techniques Trouble Shooting process	14	8. Use of Netstat and its options
	41st	Trouble Shooting Tools: PING,IPCONFIG, IFCONFIG, NETSTAT		
	42nd	TRACEROOT, Wiresharp/ Dsniffer/ Pcop		
15th	43th	Wireless Networking Basics of Wireless: Wireless MAN, Networking Networking, wireless LAN, Wi-Fi,WiMax,(Broad band Wireless) and Li-Fi	15.	9. Connectivity troubleshooting using PING, IPCONFIG, IFCONFIG
	44th			
	45th			
16th	46th	**REVISION**	16.	10. Configuring of IP addresses using simulator (Example - Cisco Packet Tracer).
	47th	**PTM**		
	48th	**3rd Sessional Test (Tentative)**		

NBA has defined the following seven POs for an Engineering diploma graduate:

i) **Basic and Discipline specific knowledge**: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

ii) **Problem analysis:** Identify and analyze well-defined engineering problems using codified standard methods.

iii**)** **Design/ development of solutions**: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

iv) **Engineering Tools, Experimentation and Testing**: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

v) **Engineering practices for society, sustainability and environment**: Apply appropriate technology in context of society, sustainability, environment and ethical practices.

vi) **Project Management**: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

vii) **Life-long learning**: Ability to analyze individual needs and engage in updating in the context of technological changes.

Program Specific Outcomes (PSOs)

PSOs are a statement that describes what students are expected to know and be able to do in a specialized area of discipline upon graduation from a program. Program may specify 2-4 program specific outcomes, if required.

These are the statements, which are specific to the particular 11 program. They are beyond POs. Program Curriculum and other activities during the program must help in the achievement of PSOs along with POs.