

Course : *INTERNETWORKING*

Course specification: theoretical & practical

Course code: CPT 215

Contact hours: 4 hours/wk

Theoretical: 2 hrs/wk

Practical : 2 hrs/wk

General objectives

1. IDENTIFY INTERNETWORKING CONCEPTS
2. OVERVIEW OF LAN TECHNOLOGIES REVIEW
3. UNDERSTAND INTER-NETWORKING DEVICES
4. UNDERSTANDING OF INTER-NETWORKING WITH ROUTING
5. ROUTING PROTOCOL EXAMPLES
6. UNDERSTAND CISCO ROUTERS
7. LAN and WAN concepts
8. Ethernet Basics
9. ISDN Basics

OBJECTIVES :-IDENTIFY INTERNETWORKING CONCEPTS						
week	Specific Learning Outcome:	Teachers Activities	Resources	Specific Learning Outcome:	Teachers Activities	Resources
1	Understand Networking with bridges, switches & routers	Explains the concepts of internetworking with bridges, switches & routers.	Capability to project the Desktop to all students	Recognition of different types of internetworking devices such as Repeaters, Routers, Bridges Hubs.	Supervise the laboratory and support students in their practical work	Communication lab equipped with Repeaters, Routers, Bridges,
2	Identify definition of, and forces behind, inter-networking Overview of devices and inter-networking concepts	Explains the internetworking concepts and discuss the specifications of internetworking devices (bridges, switches & routers)	A comprehensive workbook of internetworking		Supervise the laboratory and support students in their practical work	Small network, Personal Computers.
OBJECTIVES :-OVERVIEW OF LAN TECHNOLOGIES REVIEW						
week	Specific Learning Outcome	Teachers Activities	Resources	Specific Learning Outcome	Teachers Activities	Resources
3	Understand architecture (Ethernet- Token ring- FDDI)	Explain the architecture of the ETHERNET Explains Token ring architecture Explains FDDI architecture	Capability to project the Desktop to all students A comprehensive workbook of internetworking	- installing ETHERNET & TOKENRING AND FDDI networks	Supervise the laboratory and support students in their practical work	Communication lab equipped with Repeaters, Routers, Bridges, Small network, Personal Computers.
OBJECTIVES :-UNDERSTAND INTER-NETWORKING DEVICES						
week	Specific Learning Outcome	Teachers Activities	Resources	Specific Learning Outcome	Teachers Activities	Resources
4	To understand : The features of (repeater – bridge) Transparent bridging	Explains features of a repeater and bridge Explain bridging.	Capability to project the Desktop to all students A comprehensive workbook of internetworking	- design VLAN	Show and explain to students the various equipments and Supervise the laboratory practical work	Communication lab equipped with Repeaters, Routers, Bridges, Small network, Personal Computers.

5	spanning tree Identify Understand different switching modes . Introduction to routing Understand VLAN technology	Explain spanning tree Explains source routing Explains features of a switch and different switching modes Explains VLAN TECHNOLOGY	The described computer components.	design VLAN	Show and explain to students the various components and Supervise the laboratory practical work	computer Communication equipment
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OBJECTIVES:-UNDRSTANDING OF INTER-NETWORKING WITH ROUTING

week	Specific Learning Outcome	Teachers Activities	Resources	Specific Learning Outcome	Teachers Activities	Resources
6	List Features of a router Understand Network and MAC addressing Understand Address mapping	Explain the features of the router and MAC addressing Explain address mapping and routing tables	Capability to project the Desktop to all students	To be able to The Practices MAC addressing	Supervise the laboratory and support students in their practical work	Communication lab equipped with Repeaters.
7	Know Routing tables Understand Routing protocols (rip and ospf) Ip switching Know protocols, routed and non-routed Summary bridges vs routers	Explain routing protocols and IP switching Explain the routed protocols and non-routed protocols Give the students summery about bridges and routers	A comprehensive workbook of internetworking	Use mapping and routing tables Know the difference between routed protocols and non-routed protocols	Show and explain to students the various components and Supervise the laboratory practical work	Routers, Bridges, Small network, Personal Computers.

OBJECTIVES :-ROUTING PROTOCOL EXAMPLES

week	Specific Learning Outcome	Teachers Activities	Resources	Specific Learning Outcome	Teachers Activities	Resources
8	To understand OSI and TCP/IP models	Review OSI and TCP/IP models with students	Capability to project the Desktop to all students A comprehensive workbook of internetworking	To be able tounderstand the basics of the OSI, TCP/IP models	Supervise the laboratory and support students in their practical work	Communication lab equipped with Repeaters, Routers, Bridges, Small network, Personal Computers.
9	address classes a to e. IP addressing and subnetting	Discuss the TCP/IP addressing and subnetting		<ul style="list-style-type: none"> Learn the differences between connection-oriented and connectionless services. 		
10	What Is a LAN? LAN Protocols and the OSI Reference Model LAN	Discuss LAN components the OSI reference model	Components of LAN	Learn about different LAN protocols.	Supervise the laboratory and support students in their practical work	LAN components

	Media-Access Methods			<ul style="list-style-type: none"> Understand the different methods used to deal with media contention. Learn about different LAN topologies 	and practical work	
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OBJECTIVES :-NETWORK MANAGEMENT (SNMP)

week	Specific Learning Outcome	Teachers Activities	Resources	Specific Learning Outcome	Teachers Activities	Resources
11	What Is a WAN? Point-to-Point Links Circuit Switching Packet Switching	Give examples and explain: WAN, Point-to-Point Links, Circuit Switching and packet Switching	Make available components for Circuit and Packet Switching. Make also available a Network Simulation software eg CISCO, OPNET	Becoming familiar with WAN terminology. <ul style="list-style-type: none"> Learning about different types of WAN connections. Becoming familiar with different types of WAN equipment. Becoming familiar with packet switching 	Use software to demonstrate to students the working of WAN, its components, Switching.	CISCO, OPNET software.

OBJECTIVES :-UNDERSTAND Cisco routers

week	Specific Learning Outcome	Teachers Activities	Resources	Specific Learning Outcome	Teachers Activities	Resources
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12	<p>To understand :</p> <p>Cisco routers andCable the network Both LAN and WAN and connect the routers and configure related protocols .</p>	<p>Explains how to Execute the following on Cisco routers</p> <p>Cable the network Explain Both LAN and WAN and connect the routers.</p>	<p>Capability to project the Desktop to all students</p> <p>A comprehensive workbook of internetworking</p>	<p>To be able to :</p> <p>Execute the following on Cisco routers</p> <p>Cable the network Connect the routers.</p>	<p>Supervise the laboratory and support students in their practical work</p>	<p>Communication lab equipped with Repeaters, Routers, Bridges, Small network, Personal Computers. Network operating system like Microsoft windows NT</p>
13	<p>Ethernet—A Brief History</p> <p>Ethernet Network Elements</p> <p>Ethernet Network Topologies and Structures</p> <p>The Basic Ethernet Frame Format</p> <p>Frame Transmission</p>	<p>Explain the components and working of Ethernet. Design and explain the various topologies of Etherne Explain frame formatting and transmission.</p>	<p>Ethernet components</p>	<p>Understand the required and optional MAC frame formats, their purposes, and their compatibility requirements.</p> <p>List the various Ethernet physical layers, signaling procedures, and link media requirements/limitations.</p>	<p>Supervise the laboratory activities.</p>	<p>Computer Communication equipments .</p>
week	Specific Learning Outcome	Teachers Activities	Resources	Specific Learning Outcome	Teachers Activities	Resources
14	<p>Half-Duplex Transmission—The CSMA/CD Access Method , Frame Reception 10-Mbps Ethernet— 10Base-T , 100 Mbps— Fast Ethernet , 100Base-X ,100Base- T4, 100Base-T2 , 1000 Mbps—Gigabit Ethernet, 1000Base-T, 1000Base-X</p>	<p>Explain each concept as listed in the specific outcome</p>	<p>Make available the various transssion comonents</p> <p>A comprehensive workbook of internetworking</p>	<ul style="list-style-type: none"> Describe the trade-offs associated with implementing or upgrading Ethernet LANs— choosing data rates, operational modes, and network equipment. 	<p>Supervise the laboratory and support students in their practical work</p>	<p>The various network devices.</p>

15	<p>Integrated Services Digital Network</p> <p>Introduction to ISDN Devices, Services</p> <p>ISDN BRI Service, ISDN PRI Service, ISDN Specifications, Layer 1, Layer 2, Layer 3</p>	<p>Explain the concepts of ISDN. Discuss the ISDN devices, services, specification</p> <p>Discuss the layers</p>	<p>Components of digital network and telephoning</p>	<p>Explain what is ISDN</p> <p>Describe ISDN devices and how they operate.</p> <p>Describe the specifications for ISDN data transmittal for the peruthree layers at which ISDN transmits</p>	<p>Explain the concepts of ISDN. Discuss the ISDN devices, services, specification</p> <p>Discuss the layers</p>	<p>Supervise the laboratory and support students in their practical work</p>
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