GOVERNMENT OF TAMILNADU
DIRECTORATE OF TECHNICAL EDUCATION,CHENNAI
STATE PROJECT COORDINATION UNIT
(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	ROUTING AND SWITCHING
Course Code	CSE/2020/026
Course Duration	80 Hours
Minimum Eligibility Criteria and Pre-requisites (if any)	ITI/10th/+2/Diploma /Graduates
Course Objectives	The objectives of the training module is to ● Study the architecture, components, and operations of routers and switches in a small network. ● Configure and troubleshoot a router and a switch for basic functionality ● Resolve common issues with Routing protocols in networks.
Course Outcomes	At the end of training, the participants will be able to ● Configure and troubleshoot basic operations of a small switched network ● Describe how VLANS create logically separate networks and how routing occurs between them ● Configure and verify static routing and default routing
Expected Job Roles	Network Administrator, Network Engineer

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
CSE/2020/026	Routing and Switching	Theory	25	10	20	3 Hours
		Practical	55	40	80	
		Total	80	50	100	

CSE/2020/026 - ROUTING AND SWITCHING

DETAILED SYLLABUS

UNIT NO	MODULES	NO.OF.HOURS THEORY
I	NETWORKING FUNDAMENTALS	
1.1	IP v4 and IPv6 Address Resolution Protocol (ARP) DHCP and DNS Configuration TCP and UDP protocols ICMP error messages NAT ,ACL	6
II	SWITCHING	
2.1	Basics of switching, Need for MAC addresses. Use of VLANs to separate traffic. Spanning-tree to create loop-free topologies. Protect switches against a variety of attacks. Overview of VTP, RSTP	6
III	ROUTING PROTOCOLS	
3.1	Describe the purpose and operations of a route, routing metric, routing tables, and the router lookup process Static Routing Dynamic Routing Dynamic Routing Protocols	5
IV	ROUTING INFORMATION PROTOCOL (RIP)	
4.1	Introduction Routing metric Distance Vector Routing RIP Timers Configuring RIP on router RIP Default route configuration	4
V	OPEN SHORTEST PATH FIRST (OSPF)	
5.1	Introduction Routing metric Link state routing OSPF Area OSPF Message types Configuring OSPF Additional features OSPF Default route configuration Redirection between OSPF and RIP	4
	Total Theory Hours	**25**
	Total Practical Hours	**55**
	Total Hours	**80**

PRACTICAL (55 HOURS)

1. Configure and Troubleshoot Network Address Translation operations
2. Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6
3. Configure and verify DHCP
4. Configure and verify DNS
5. Configure and troubleshoot basic operations of a small switched network
6. Configure and Troubleshoot VLAN
7. Configure and verify Spanning Tree Protocol
8. Configure Port security on a Cisco Switch
9. Configure and troubleshoot basic operations of routers in a small routed network:
10. Configure and troubleshoot Static routing
11. Configure and troubleshoot. Routing Information Protocol(RIP)
12. Configure default route in RIP
13. Configure and troubleshoot Open Shortest Path Protocol(OSPF)
14. Configure route summarization
15. Configure redistribution between RIP and OSPF
16. Installing Hadoop in Standalone mode
17. Installing Hadoop in Psuedo Distributed Mode
18. File management tasks in Hadoop
19. Implementation of Map Reduce program using Wordcount mapreduce.
20. Implementation of Map Reduce program using Temperature analysis
21. Implementation of Map Reduce program using Matrix multiplication
22. Working with Hive.
23. Creating managed tables in Hive.
24. Creating external tables in Hive.
25. Working with table properties, managing tables in Hive.

HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1	Network Switch, Router
2	Computer with internet connection

SOFTWARE REQUIREMENT

S.NO	LIST OF SOFTWARE
1	Network Simulation software

REFERENCE BOOKS

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Cisco routing and Switching Guide	Vendell odom	Cisco
2	Cisco routing and Switching Guide	Scott Empson	PEARSON INDIA

ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training , Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnic.

END EXAMINATION

ALLOCATION OF MARKS

S.No	Description	Max.Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Procedure	10
	b)Execution	30
	c)Output	20
	d)Record	20
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

CSE/2020/026 - ROUTING AND SWITCHING

(Maximum Marks : 20)

(N.B: Answer any **twenty** questions) **20 x 1 = 20 Marks**

1. Write any two differences between IPv4 and IPv6.
2. Name any two ICMP error messages.
3. Expand TCP and UDP.
4. What is the need for NAT?
5. What is the use of Access Control List (ACL)?
6. Name the protocol which converts IP address into MAC address.
7. What is the need for MAC address?
8. Write any uses of VLANs.
9. Write any two mechanisms to protect a switch from attacks.
10. What is RSTP?
11. What is VLAN Trunking Protocol (VTP)?
12. What is Routing?
13. Name any two routing metrics.
14. Write any two differences between static and dynamic routing.
15. Name any two dynamic routing protocols.
16. What is the purpose of a routing table?
17. Which protocol uses distance vector routing?
18. What is the routing metric used in RIP?
19. Name any two timers used in RIP.
20. Write any advantages of RIP.
21. What is the difference between RIP and OSPF?
22. What is Link state routing?
23. What is meant by area in OSPF?
24. Name any OSPF messages.
25. What is meant by Default route?