Course Code: IT430

Course Level UG

Course Title Dynamic Routing and Troubleshooting

Course Description :

Credit Units

L	T	P/S	SW	AS/DS	FW	No. of PSDA	Total Credit Unit
3	0	2	0	0	0	0	4

Course Objectives :

SN.	Objectives
1	This course describes the architecture, components, and operations of routers and switches in larger and more complex networks. Participants learn how to configure routers and switches for advanced functionality. By the end of this course, participants will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, and STP in both IPv4 and IPv6 networks. Participants will also develop the knowledge and skills needed to implement a WLAN in a small-to-me

Pre-Requisites : General

SN.	Course Code	Course Name

Course Contents / Syllabus :

SN.	Module	Descriptors / Topics	Weightage
1	Module I: Introduction to Scaling Networks	Introduction, implementing a Network Design, Switch Hardware, Router Hardware, Managing Devices, Network Security, ACL, NAT	20.00
2	Module II: LAN Redundancy & Link Aggregation	Introduction, Spanning Tree Concepts, Purpose of Spanning Tree, STP Operation, Varieties of STP, Spanning Tree Configuration, First Hop Redundancy Protocols, Link Aggregation Concepts, Link Aggregation Configuration, Troubleshooting Link Aggregation.	20.00
3	Module III: Wireless LANs	Wireless LAN Concepts, Wireless LAN Standards, Wireless LAN Security, Wireless LAN Configuration, WAN, VPN & IP Sec, QoS, Network Design & Management.	20.00
4	Module IV: Adjust and Troubleshoot Single-Area OSPF & Multi area OSPF	Characteristics of OSPF, Configuring Single-Area OSPFv2, Configuring Single-Area OSPFv3, Advanced Single-Area OSPF Configurations, Troubleshooting Single-Area OSPF, Multi-Area OSPF Operation, Configuring Multi-Area OSPF	20.00
5	Module V: Advanced Configurations and Troubleshooting	Cloud Computing, Optimize, Monitor and Troubleshoot Networks, Emerging Network Technologies. Network Virtualization, Network Automation	20.00

Course Learning Outcomes :

SN.	Course Learning Outcomes
1	• Identify, configure and troubleshoot enhanced switching technologies such as VLANs, Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Plus Protocol (PVST+), and Ether Channel
2	• Identify, configure, and troubleshoot first hop redundancy protocols (HSRP) in a switched network
3	• Identify, configure, and troubleshoot wireless routers and wireless clients
4	• Configure and troubleshoot routers in a complex routed IPv4 or IPv6 network using single-area OSPF, multi area OSPF.
5	• Manage Cisco IOS® Software licensing and configuration files

Pedagogy for Course Delivery :

SN.	Pedagogy Methods
1	The class will be taught using classroom teaching methodology. Students' learning and assessment will be on the basis of four quadrants and flipped class method. E-content will be also provided to the students for better learning. The class will be taught using theory, practical and case-based method.

Theory /VAC / Architecture Assessment (L,T & Self Work): 75.00 Max : 100

Attendance+CE+EE : 5+35+60

SN.	Type	Component Name	Marks
1	Attendance		5.00
2	End Term Examination (OMR)		60.00
3	Internal	CLASS QUIZ	10.00
4	Internal	MID TERM EXAM	15.00
5	Internal	INTEGRATED PROJECT	10.00

Lab/ Practical/ Studio/Arch. Studio/ Field Work Assessment : 25.00 Max : 100

Attendance+CE+EE : 5+35+60

SN.	Type	Component Name	Marks
1	Attendance		5.00
2	External	PRACTICAL	30.00
3	External	VIVA VOCE	30.00
4	Internal	VIVA VOCE	10.00
5	Internal	PRACTICAL / LAB RECORDS	10.00
6	Internal	PERFORMANCE	15.00

Lab/ Practical details, if applicable :

SN.	Lab / Practical Details
1	Application of Cisco Router and Switches in Enterprise Network with example design. 2. Enterprise level switching techniques. 3. Creating LAN with switch and preventing loops with example. 4. Creating, Managing and deleting different VLAN. 5. Wireless LAN Configuration 6. Configuring router with Single-Area OSPF Protocol. 7. Configuring router with Multi-Area OSPF Protocol. 8. Troubleshooting Single-Area OSPF 9. Configuring router with EIGRP Protocol. 10. Configuring EIGRP for IPv6

List of Professional skill development activities :

No.of PSDA : 0

SN.	PSDA Point

Text & References :

SN.	Type	Title/Name	Description	ISBN/ URL
1	Book	CCNA-Routing & Switching, Scaling Networks, Cisco Certified Networking Academy		
2	Book	• Behrouz Forouzan ,Data Communications and Networking ; Tata McGraw-Hill ;Edition 5; 2012		
3	Book	• Andrews S. Tanenbaum, David J Wetherall; Computer Networks; Pearson Education; Edition 5, 2012		
4	Book	• William Stallings, Data & Computer Communications, PHI, Edition 6, 2012		
5	Book	• Jerry Fitzgerald and Alan Dennis, Business Data Communications & Networking, John Wiley & Sons Inc		