PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Autonomous
Siddhartha Nagar, Vijayawada–520010
Re-accredited at 'A+' by the NAAC

Course Code				**23CGMAP234**			
Title of the Course				**COMPUTER NETWORKS LAB**			
Offered to: (Programme/s)				**B.Sc Hons (CSCS)**			
L	**4**	**T**	**0**	**P**	**0**	**C**	**3**
Year of Introduction:		**2024-25**		**Semester:**			**3**
Course Category:		**Major Practical**		**Course Relates to:**		**Global / National / Regional / Local**	
Year of Revision:				**Percentage:**			
Type of the Course:				**Skill Development / Employability**			
Crosscutting Issues of the Course :							
Pre-requisites, if any				**Knowledge in Computer Networking concepts and CISCO packet tracer**			

Course Category: Minor 1 **3L 0T 2P 4C**

Pre – requisite: Computer Fundamentals

Course Description:

This course provides students with an exploration of fundamental computer network concepts, including hardware, software, transmission media, addressing, and routing. It covers essential technologies and protocols necessary for effective comprehension and management of modern computer networks.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	Equip students with a thorough understanding of computer network concepts apart from developing comprehensive understanding of network architecture and protocols by providing hands on experience on Cisco Packet tracer software.
2	Ensure that students possess the ability to analyse network protocols, topologies and characteristics of various categories of transmission media.
3	Provide students with a foundational proficiency in IP addressing and understand the role of switches in network management.
4	Develop in students a robust comprehension of spanning tree protocol and explore network routing techniques.
5	Enable students to define the need of network monitoring and implementing WLAN standards apart from handling IP ACLs.

Course Outcomes:

At the end of the course, the student will / will be…

NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand the practical applications for basic network commands and network configurations by installing Cisco packet Tracer.	K2	**1,2,7**	**2**
CO2	Comprehend network protocols and topologies apart from identifying and analysing transmission media	K2	**1,2,7**	**2**
CO3	Utilize Cisco Packet Tracer to simulate and demonstrate routing algorithms and protocols effectively.	K3	**1,2,7**	**2**
CO4	Evaluate and analyse advanced routing protocols.	K4	**1,2,7**	**2**
CO5	Comprehend the purpose and management of IP ACLs apart from configuring and managing NAT.	K2	**1,2,7**	**2**

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO-PSO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**1**	**2**					**3**		**2**
CO2	**1**	**3**					**3**		**3**
CO3	**1**	**3**					**3**		**3**
CO4	**1**	**3**					**3**		**3**
CO5	**1**	**3**					**3**		**3**

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure:

Unit – I: Introduction to Computer Networks (15 Hrs.)

Description:

This course is tailored to provide a structured overview of the networking fundamentals, equipping students with the necessary knowledge to understand and work with various network types and models.

Exercises:

1. Install Cisco packet tracer and perform networking operations.
2. Basic network commands and network configurations.

Learning Outcomes:

By the end of the unit, students will have a comprehensive understanding of computer network fundamentals and hands-on experience with Cisco Packet Tracer for performing network operations.

Web Resources:

1. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai. “Download Cisco Packet Tracer – step – by – step instructions”, 2022.
2. https://www.youtube.com/watch?v=yjLTPBingE&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf

Unit – II: Transmission Media (15 Hrs.)

Description:
This unit provides an in-depth understanding of the fundamental components and configurations of computer networks. Students will explore various network protocols, topologies, and the different types of transmission media used in networking. The course covers both guided transmission media, and unguided transmission methods. Additionally, the unit examines the role and types of communication satellites, including geostationary, medium-Earth orbit, and low Earth-orbit satellites.

Exercises:

1. Creating and connecting networks using Cisco Packet Tracer.
2. Demonstrate creating network topologies.

Learning Outcomes:
By the end of this unit, students will be able to gain knowledge in network topologies and types of transmission media apart from hand – on experience in creating LAN connections using Cisco packet tracer..

Web Resources:

1. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, Creating simple network connection using different transmission media in Cisco Packet Tracer. https://www.youtube.com/watch?v=TB4kUZ9nrok&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=8
2. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, "Types of Topologies – Demonstrating Bus Topology using Cisco Packet Tracer". https://www.youtube.com/watch?v=RmDxQqr2h1I&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=13

Unit – III: IP Addressing and Switches (15 Hrs.)

Description:

This unit delves into advanced concepts of IP addressing, focusing on both IPv4 and IPv6, and provides a comprehensive understanding of subnetting and network traffic control using Cisco switches. The unit also covers the basics of subnetting, including IP address classes, subnet masks, and Variable Length Subnet Masks (VLSMs). Additionally, students will explore the purpose and functions of Layer 2 switches and gain hands-on experience in managing and controlling network traffic with Cisco switches.

Exercises:

1. Demonstrate connecting LAN using switches.
2. Perform operations on switches

Learning Outcomes:
By the end of this unit, students will be able to understand the role of switches in computer network and differentiate IPV4 and IPV6 addressing versions.

Web Resources:

Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai, "Differentiate Hub and switch".
https://www.youtube.com/watch?v=zZS3tYGtx3o&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf&index=9

Unit – IV: Network Routing (15 Hrs.)

Description:

This unit covers advanced networking protocols and routing techniques essential for managing complex networks. Students will learn about the Spanning Tree Protocol (STP) and its operation, the benefits and management of VLANs, and VLAN trunking. The unit also delves into network routing, exploring various routing protocols used in routing.

Exercises:
1. Performing an Initial Router Configuration.

2. Demonstrate Dynamic Routing protocols like
1. OSPF.
2. RIP
3. EIGRP.

Learning Outcomes:
By the end of this unit, students will be able to Apply Python function, classes and modules to solve engineering problems.

Resources:

1. Otom Gurutech Trainer, Kenya, 2023, "How to Configure RIP, EIGRP and OSPF using Cisco Packet Tracer".
https://www.youtube.com/watch?v=ggCmnt7cD_g

Unit – V: Monitoring Networks (15 Hrs.)

Description:
This unit focuses on the techniques and tools for monitoring networks, the standards and operation modes of Wireless Local Area Networks (WLANs), and the implementation of IP Access Lists (IP ACLs) and Network Address Translation (NAT)..

Exercises:

1. Configure SNAT using Cisco Packet Tracer.
2. Router Access Control List using Cisco Packet Tracer.

Learning Outcomes:
By the end of this unit, students will be able to handle ACL, configure and manage SNAT.

Resources:

1. Ramalingam Murugan, Vellore Institute of Technology, " Cisco Packet Tracer – SNAT", https://www.youtube.com/watch?v=p-t2qUNwFec
2. Er Sital Mandal, "Router Access Control List using Cisco Packet Tracer", 2021. https://www.youtube.com/watch?v=zH8MxRCBRko

Web Resources:

1. Dr. K. Sudha, Assistant Professor, SRM Institute of Science and Technology , Chennai. “Download Cisco Packet Tracer – step – by – step instructions”, 2022. https://www.youtube.com/watch?v=yjLTPBingE&list=PLnpr13oHoA7bF7yQTjMHB4mb8BtvGYyzf
2. DigiDev, Cisco Packet Tracer for Beginers, https://www.youtube.com/watch?v=ty0HMs48U1k
3. Free Online Courses for Cisco Packet Tracer
   - Getting Started with Cisco Packet Tracer
   - Exploring Networking with Cisco Packet Tracer
   - Introduction to Packet Tracer Exam

23CGMAP234 : **Computer Networks Lab**

Offered to: B. Sc. Hons. (CSCS) **Semester: V**
Max. Marks : 50 (CIA: 15 + SEE: 35) **Hrs/Week: 2**

Model Paper : Practicals

Time: 3 Hrs. **Max. Marks: 35**

Section – A

1. Experiment-1 15 M

2. Experiment-2 10 M

Section – B

Viva Voce 10 M

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