

Course Code MNC241 **Course Name** Networks Fundamentals

**Pre-Requisite** 

Year of Study 2<sup>nd</sup> / 2<sup>nd</sup>

**Course Type** Major Elective

**Level of Course** BSc/1st Cycle ECTS Credit 7.5

**Language of Instruction** English

Mode of Delivery On Campus

# **Course Objectives:**

This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.

#### Learning Outcomes:

Upon successful completion of the course, students should be able to:

- Identify and describe the devices and services used to support communications in data networks and the Internet
- · Describe the role of protocol layers in data networks

• Explain the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments

- Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks
- Explain fundamental Ethernet concepts such as media, services, and operations
- Build a simple Ethernet network using routers and switches
- · Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations
- · Employ common network utilities to verify small network operations and analyze data traffic

#### **Teaching Methodology:**

Lectures 42 Hours

Labs 30 Hours

## **Course Content**

Exploring the Network: Globally Connected, LANs, WANs, and the Internet, The Network as a Platform, The Changing Network Environment

Configuring a Network Operating System: IOS Bootcamp, Getting Basic, Addressing Schemes

Network Protocols and Communications: Rules of Communication, Network Protocols and Standards, Moving Data in the Network

Network Access: Physical Layer Protocols, Network Media, Data Link Layer Protocols, Media Access Control

Ethernet: Ethernet Protocol, Address Resolution Protocol, LAN Switches

Network Layer: Network Layer Protocols, Routing, Routers, Configuring a Cisco Router

Transport Layer: Transport Layer Protocols, TCP and UPD IP

Addressing: IPv4 Network Addresses, IPv6 Network Addresses, Connectivity Verification

Subnetting IP Networks: Subnetting an IPv4 Network, Addressing Schemes, Design Considerations for IPv6

Application Layer: Application Layer Protocols, Well-Known Application Layer Protocols and Services, The Message Heard Around The World

It's a Network: Create and Grow, Keeping the Network Safe, Basic Network Performance, Managing IOS Configuration Files, Integrated Routing Services

### **Assessment Methods:**

Final Exams

Assignment

Labs/Mid term

## **Required Textbooks/Reading:**

Title	Author(s)	Publisher	Year
Network Fundamentals, CCNA	Mark Dye, Rick		
Exploration Companion Guide	McDonald and		
	Antoon Rufi		
Network Fundamentals, CCNA			
Exploration Labs and Study Guide			
CCNA Cisco Certified			
CCNA Cisco Certified Network	Antoon Rufi, Priscilla		
Associate Study Guide	Oppenheimer, Belle		
	Woodward, Gerlinde		
	Brady, Todd Todd		
	Lammle		
CCNA IOS Commands Survival Guide	Todd Lammle's		
Todd Lammle			