Module (Course Syllabus) Catalogue

2025-2026

College/ Institute	**Technical College of Computer and Informatic Engineering**	
Department	**Information System engineering**	
Module Name	**Internet Technology(CCNA1)**	
Module Code	**INT501**	
Degree	**Technical Diploma** ☐ **Bachelor** ☒ **High Diploma** ☐ **Master** ☐ **PhD** ☐	
Semester	**5**	
Qualification		
Scientific Title		
ECTS (Credits)	**6**	
Module type	**Prerequisite** ☐ **Core** ☒ **Assist.** ☐	
Weekly hours	**4**	
Weekly hours (Theory)	**(2)hr Class**	**(24)Total hrs Workload**
Weekly hours (Practical)	**(2)hr Class**	**(24)Total hrs Workload**
Number of Weeks	**12 weeks**	
Lecturer (Theory)	**Omar Shirko Mustafa**	
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Course Book

Course Description	This networking course offers a comprehensive overview of fundamental and advanced networking concepts, starting with modern network technologies and basic configurations of switches and end devices. It covers Ethernet concepts, including physical layer components, number systems, data link layer operations, and Ethernet switching. You'll learn about communication between networks by configuring routers, managing IP addressing with both IPv4 and IPv6, and utilizing ICMP for diagnostics. The course also explores network application communications through transport and application layers, and culminates in building and securing a small network, applying security fundamentals to protect and manage network infrastructure. Overall, it provides a solid foundation in networking principles, configuration, and security practices.
Course objectives	The objective of this networking course is to equip students with a comprehensive understanding of fundamental networking concepts and practical skills necessary for designing, configuring, and securing small networks. Students will learn the principles of modern networking, including the operation and configuration of network devices such as switches and routers. The course will cover essential networking protocols and models, including Ethernet, IP addressing, and ICMP, while providing an in-depth understanding of Ethernet technology, the physical and data link layers, and Ethernet switching. Students will also explore the network layer, address resolution, and basic router configuration for effective inter-network communication. Additionally, the course will focus on IP addressing schemes for both IPv4 and IPv6, network application communications, and the transport and application layers. By the end of the course, students will be able to design, build, and secure a small network, with a strong emphasis on network security fundamentals to protect against potential threats. This course is ideal for beginners in networking, including students and professionals seeking foundational knowledge and hands-

	on experience.
Student's obligation	**Arrive on time and prepared for all classes**, meetings, academic activities, and special events. Give attention to quality and excellence in completing assignments.
Required Learning Materials	

Evaluation

Task		Weight (Marks)	Due Week	Relevant Learning Outcome
Paper Review				
Assignments	Homework	5		
	Class Activity	2		
	Report	10		
	Seminar			
	Essay			
	Project			
Quiz		8		
Lab.		10		
Midterm Exam		25		
Final Exam		40		
Total		100		

Specific learning outcome:	The specific learning outcomes of this course are that students will be able to understand and explain the fundamental concepts of networking, including the function and configuration of devices such as switches and routers. They will demonstrate the ability to configure basic network devices, manage IP addressing for both IPv4 and IPv6, and explain the operation of key networking protocols within the OSI and TCP/IP models. Students will gain in-depth knowledge of Ethernet technology, including the physical and data link layers, and will be proficient in configuring routers for inter-network communication. They will also be able to use ICMP tools to diagnose network issues and understand the roles of the transport and application layers in supporting

	network services. Additionally, students will identify and implement basic network security measures to protect against common threats, and they will be capable of designing and building a small network that meets specific needs while ensuring security and reliability.
Course References:	For CCNA1 (Introduction to Networks) study, a highly recommended reference is Cisco's own learning resources and documentation. The Cisco Networking Academy provides comprehensive materials for CCNA1. You can find these resources at: • **Cisco Networking Academy**: Cisco Networking Academy Additionally, Cisco offers a free digital version of the CCNA 1 textbook: • **CCNA 1 v7.0 - Introduction to Networks (Textbook)**: Cisco CCNA 1 v7.0 Textbook

Course topics (Theory)	**Week**	**Learning Outcome**
Basic Network connectivity and communications:1-networking today2-Basic switch and end device configuration.3-Protocols and models.	**Week 1,2**	
- Ethernet concepts:4-Physical layer,5-Number systems,6-Data Link layer, 7-Ethernet switching.	**Week 3,4**	
- Communication between networks:8-Network layer,9-address resolution,10-basic router configuration.	**Week 5,6,7**	
- IP addressing:11-IPv4 addressing ,12- IPv6 addressing,13-ICMP	**Week 8,9**	
-Network application communications:14-Transport layer,15-application layer.	**Week 10,11,12**	
-Building and securing a small network:16-network security fundamentals,17-Building and a small network	**Week 13,14**	
Practical Topics	**Week**	**Learning Outcome**

Start with **networking today** by exploring modern hardware and configuring basic **switches and end devices**. Understand **protocols and models** through hands-on setups and testing. Dive into **Ethernet concepts** by working with physical layer components, number systems, data link layer settings, and Ethernet switching techniques. Learn **communication between networks** by configuring **network layer** settings, resolving addresses, and setting up basic router configurations. Master **IP addressing** with IPv4 and IPv6, and understand **ICMP** for network diagnostics. Explore **network application communications** by configuring and testing transport and application layer protocols. Finally, focus on **building and securing a small network** by implementing security fundamentals and designing a functional network with necessary services.	Week1- Week14	to provide a comprehensive understanding of networking concepts and practical skills, including configuring modern network hardware, setting up and managing switches and end devices, and applying networking protocols and models. You'll master Ethernet concepts by working with physical and data link layers, and gain expertise in Ethernet switching. You'll learn to manage inter-network communication through IP routing and address resolution, configure and troubleshoot both IPv4 and IPv6 addressing, and use ICMP for network diagnostics. Additionally, you'll test and manage network application communications across transport and application layers, and design, build, and secure a small network to apply security fundamentals effectively. This hands-on experience prepares you for real-world networking scenarios by integrating setup, management, and security skills.

Q2) *Multiple choices:*

1- When a server wants to respond to a client, it sends messages to the outgoing queue, using the source port number specified in the
A) Port B) Request C) Data Frame D) Packets

2- UDP is used for management processes such as
A) SMTP B) TCP/IP C) SNMP D) TCP

3- The Network layer is responsible for

A) Node-to-Node delivery
B) Host-to- host delivery
C) Process to Process delivery
D) Source to Host Delivery

Solution: B, C and B

Extra notes: