

Course Title:	Preparing for the CCNA1 certification
Course Code:	CSE232
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Amina GHARSALLAH
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course identification

1. Credit hours:	3 (1.5-0-1.5)
2. Course type	
a. College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>	
b. Fundamental <input checked="" type="checkbox"/> Transversal <input type="checkbox"/> Optional <input type="checkbox"/>	
3. Level/year at which this course is offered:	1.2/3
4. Pre-requisites for this course (if any):	Knowledge of protocol layering, Basic computer and networking Fundamentals, Basic graph theory

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	Traditional classroom	34.5	79.5
2	Blended	45		
3	E-learning		
4	Distance learning		
5	Other ()		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	22.5
2	Laboratory/Studio	22.5
3	Tutorial	
4	Others (specify)	
	Total	45

B. Course Objectives and Learning Outcomes

Course Description

This course introduces the fundamentals of computer networking, preparing students for the CCNA 1 certification. It covers network components, communication protocols, IP addressing, subnetting, and basic router and switch configuration.

Students will learn how to set up and manage local networks (LANs), configure network devices using the Command Line Interface (CLI), and troubleshoot common network issues. The course also includes hands-on labs and network simulations to apply theoretical concepts in real-world scenarios.

By the end of this course, students will be able to design, configure, and troubleshoot small networks, understand network protocols, and be ready to take the CCNA 1 exam.

Course Main Objectives

This course aims to:

- ✓ Introduce fundamental networking concepts, including network components, topologies, and communication methods.
- ✓ Develop a deep understanding of the OSI and TCP/IP models, focusing on protocol layers and data encapsulation.
- ✓ Teach IPv4 and IPv6 addressing and subnetting, enabling students to efficiently design and manage network addressing schemes.
- ✓ Provide hands-on experience with router and switch configurations, including basic setup, VLANs, and CLI commands.
- ✓ Introduce basic routing and switching concepts, focusing on packet forwarding, MAC addressing, and dynamic/static routing.
- ✓ Develop troubleshooting skills, using network diagnostic tools such as ping, traceroute, and Wireshark.
- ✓ Prepare students for the CCNA 1 certification, ensuring they meet the required knowledge and skills to advance in networking careers.

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and understanding	
1.1	Understand the basic concepts of computer networks.	PLO.K1
1.2	Identify the different types of networks and their topologies.	
1.3	Introduction to routing concepts.	
2	Skills	
2.1	Create and manage networks.	PLO.S1
2.2	Learn how to configure basic routers and switches.	
2.3	Understand Ethernet technologies and their use in local networks.	
2.4	Know how to configure VLANs to segment networks.	

CLOs		Aligned PLOs
2.5	Master the OSI and TCP/IP reference models.	PLO.S5
2.6	Master the concept of IP addressing.	

C. Course Content

No	List of Topics	Contact Hours
1	Chapter 1: Introduction to computer networks 1. Basic concepts of networks 2. Network types and topologies	3
2	Chapter 2: Fundamentals of communication protocols 1. OSI and TCP/IP reference models 2. Understanding of communication layers	5
3	Chapter 3: IP addressing and subnets 1. IP addressing concepts 2. Creation and management of subnetworks	6
4	Chapter 4: Configuring network devices 1. Basic configuration of routers and switches 2. Using the Command Line Interface (CLI)	3
5	Chapter 5: LAN technologies 1. Understanding of Ethernet technologies 2. Configuration of VLANs	3
6	Chapter 6: Routing Introduction to routing concepts	2.5
	Practical workshops <ul style="list-style-type: none"> • Practical workshop1: Introduction to local networks • Practical workshop2: Computer network simulation • Practical workshop3: configuration and administration of switches VLANs • Practical workshop4: Configure and administer a network 	22.5
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding		
PLO.K1	<ul style="list-style-type: none"> ✓ Understand the basic concepts of computer networks. ✓ Identify the different types of networks and their topologies. ✓ Introduction to routing concepts 	<ul style="list-style-type: none"> - Lecturing - Class discussions - Work in group 	<ul style="list-style-type: none"> - Assignments - Quizzes - Exams
2.0	Skills		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
PLO.S1	<ul style="list-style-type: none"> ✓ Know how to create and manage networks. ✓ Learn how to configure basic routers and switches. ✓ Understand Ethernet technologies and their use in local networks. ✓ Know how to configure VLANs to segment networks. 	<ul style="list-style-type: none"> - Lecturing - Practice Projects - Work in group 	<ul style="list-style-type: none"> - Assignments, - Quizzes - Exams
PLO.S5	<ul style="list-style-type: none"> ✓ Master the OSI and TCP/IP reference models. ✓ Master the concept of IP addressing. 		

2. Assessment Tasks for Students

	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	25%
2	Quizzes, Homework assignments	Random	%
3	First mid Term	8	25%
4	Final Exam	16	50%

E. Student Academic Counselling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
1- Office hours 2- Blackboard interface

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. Odom, Wendell. <i>CCNA 200-301 Official Cert Guide, Volume 1.</i> Cisco Press, 2020. 2. Lammle, Todd. <i>CCNA Certification Study Guide, Volume 1.</i> Sybex, 2020.
Essential References Materials	1. Cisco Networking Academy – CCNA Course Materials ▪ https://www.netacad.com/courses/ccna 2. Packet Tracer Network Simulation Software ▪ https://www.netacad.com/courses/packet-tracer
Electronic Materials	1. NetworkChuck – CCNA Training ▪ https://www.youtube.com/c/NetworkChuck 2. David Bombal – CCNA & Networking Basics ▪ https://www.youtube.com/c/DavidBombal

Other Learning Materials	NA
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3. Facilities Required

Item	Resources
Accommodation	Classroom board Computer lab with the necessary software Internet access
Technology Resources	Data projector

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, Faculty, Program Leaders, Peer Reviewer	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, Peer Reviewer	Direct
Quality of Learning resources	Faculty, Program Leaders, Peer Reviewer	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders, Peer Reviewer	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2024

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