هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	**Networks Support**
Course Code:	**253 CIS-4**
Program	**Technical support**
Department	**Computer Department**
College:	**Applied College**
Institution	:Najran University
Version	: 3
Last Revision Date:	1-10-2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4 hours)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (4rd semester.)					
4. Course General Description:					
This course covers essential topics from basic concepts to advanced troubleshooting techniques. Students will explore network topologies, types, and key models like OSI, while gaining practical skills in IP addressing, routing, and switching management. The curriculum includes an in-depth look at network devices, services, and remote access methods. A significant focus is placed on network troubleshooting, teaching students' systematic approaches and the use of industry-standard software tools. By course completion, students will have developed a robust understanding of network architectures and operations, preparing them for real-world networking challenges.					
5. Pre-requirements for this course (if any):					
Computer Networks 165 CIS-3					
6. Co-requisites for this course (if any):					
NO					
7. Course Main Objective(s):					
• **Develop a comprehensive understanding of network architectures, including wired and wireless topologies, types, and the OSI model.** • **Master the fundamentals of IP addressing, routing, and switching in diverse network environments.** • **Gain proficiency in identifying and configuring various network devices, services, and remote access methods.** • **Acquire advanced troubleshooting skills using systematic procedures and industry-standard software tools.** • **Apply theoretical knowledge to practical scenarios, preparing students for real-world networking challenges and professional certifications.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4 hours per week	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain the fundamental concepts and principles of computer networking, including network topologies, types, protocols, and models such as the OSI model.	K1	Lecture Individual and group discussion	Exams Assignments
1.2	Describe the functions and	K2	Lecture Individual and group discussions	Exams

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	characteristics of various network devices, services, and remote access methods used in modern network infrastructures.			Assignments
...				
2.0	**Skills**			
2.1	Configure and manage IP addressing, routing, and switching in both wired and wireless network environments	S2	Lecture Brainstorming Lecture Small group work	Exams Group reports Exams Assignment
2.2	Apply systematic troubleshooting procedures and utilize appropriate software tools to diagnose and resolve common network issues.	S1	Lecture Brainstorming Lecture Small group work	Exams Group reports Exams Assignment
...				
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate projects and assignments in team work to assemble computer and operate it.	V2	Small group work Group Presentation Projects	Group report
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours

1.	• Wired and Wireless Network Topologies
	  ○ Main topologies
	  ○ Hybrid Topology
	Ad Hoc Wireless Topology, Wireless mesh networks (*lab*)
		4

2.	• Network Types and Characteristics ○ To Server or Not LAN, WAN, MAN, CAN, PAN, and SAN	3

3.	• Network Links and Concepts
	  ○ Internet Access
	  ○ DSL, Cable Broadband, PSTN, Leased Lines
	  ○ Metro-Optical
	  ○ Satellite Internet Access
	Virtual Networking (*lab*)
		5

4.	• The OSI Networking Model ○ Physical, Data Link, Network, Transport, Session, Presentation, and Application Layers Mapping Network Devices to the OSI Model	3
5.	• Ports and Protocols ○ Connection-Oriented Protocols vs Connectionless Protocols IP, TCP, UDP, ICMP (*lab*), IPSec, Telnet (*lab*), SSH, FTP (*lab*), SFTP, TFTP, HTTP (*lab*), SMTP (*lab*), POP3 (*lab*), IMAP4, NTP (*lab*), TLS	11
6.	• Network Services DNS (*lab*), DHCP (*lab*),	6

7.	• IP Addressing
	  ○ IPv4 and IP Address Classes
	  ○ Subnet Mask Assignment, Subnetting (*lab*)
	  ○ IPv4 Public and Private Networks, Classless Interdomain Routing CIDR
	  ○ Default Gateways (*lab*), Virtual IP, IPv4 Address Types
	  ○ IPv6 Addressing, IPv6 Address Types (*lab*)
	  ○ Neighbor Discovery Protocol NDP,
	  ○ Comparing IPv4 and IPv6 Addressing
	  ○ Assigning IPv6 Addresses (*lab*)
	Identifying MAC Addresses (*lab*), Network and Port Address Translation NAT and PAT (*lab*)
		13

8.	• Managing Routing and Switching
	  ○ Routing Tables
	  ○ Static Routing (*lab*), Default Route (*lab*)
	  ○ Packet Switching, Circuit Switching
	  ○ Distance-Vector Routing (*lab*), Link-State Routing, Routing Metrics
	  ○ Virtual Local-Area Networks (*lab*)
	  ○ MDI-X, MAC Address Table
	Access Control Lists (*lab*)
		18

9.	• Network Devices
	  ○ Firewall (*lab*), Intrusion Detection System IDS
	  ○ Multilayer Switch, Access Point, Media Converter, Voice Gateway
	Load Balancer, Proxy Server, reverse proxy server
		3

10.	• Remote-Access Methods	3

	Virtual private network (VPN) (*lab*)	
11.	• Network Troubleshooting Steps and Procedures Identify the Problem, Establish a Theory of Probable Cause, Test the Theory to Determine the Cause, Establish a Plan of Action, Implement the Solution or Escalate, Verify Full System Functionality, Document Findings, Actions, Outcomes, and Lessons	2
12.	• Network Troubleshooting Software Tools ○ Wi-Fi Analyzer (*lab*) ○ Protocol Analyzer (*lab*) ○ Port Scanner Command-Line Tools (*lab*)	4
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignment	4, 7, 11	10%
2.	Mid Monthly Exam	8	20%
3.	Practical exam	15	20%
4.	Final exam	16	50%
5.			

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Emmett Dulaney, B CompTIA® Network+ N10-008 Exam Cram, 2022, ISBN-13: 978-0-13-737576-9
Supportive References	Mike Chapple and Craig Zacker, CompTIA Network+ CertMike: Prepare. Practice. Pass the Test! Get Certified! Exam N10- 008, 2023, (ISBN 9781119898153)
Electronic Materials	• https://www.comptia.org/training/by-certification/network • https://www.comptia.org/certifications/network https://www.udemy.com/course/comptia-network-certification-training/
Other Learning Materials	Manuals of Network simulators and network managements software

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Computer Lab with 25 seats + A Lecture room with 30 seats per section
Technology equipment (projector, smart board, software)	25 PCs, Data show, Cisco Packet Tracer Software, Network Simulators, Software to manage networks.
Other equipment (depending on the nature of the specialty)	Networks cabling tools, Switches and routers

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Direct: Questioners
Effectiveness of Students assessment	Teacher Audit and review committees	Direct: CW & HW Exercises and short quizzes Projects Mid and final paper exams.
Quality of learning resources	Teachers and course description committees	Indirect: Benchmarking Self-evaluation External evaluation
The extent to which CLOs have been achieved	Teacher	Direct: Measuring the learning outcomes
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	