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

Course Specification
(Bachelor)

Course Title:	Routing and Switching
Course Code:	202CCN-3
Program:	Bachelor of Science in Computer Networks
Department:	Networks and Communications Engineering
College:	Computer Science and Information Systems
Institution:	Najran University
Version:	1.0
Last Revision Date:	2 Sep 2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 (3,1,0) [Theory, Lab, Tutorial])					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 5 / Year 2)					
4. Course general Description:					

ARP, Ethernet, IP Addressing, & Subnetting Review, CISCO IOS Basics, Bridge & Switch Operations Bridge Types, Bridge Enhancements, Bridging Loops & Spanning Tree Algorithm(802.1d) Network Layer/Routing Basics, Routing Tables Workstation Decision Process, ICMP & ICMP Redirect, Basic Router Configuration, Convergence, Static vs. Default Routes vs. Dynamic, Router Discovery Protocol, Routing Protocols, RIP Version 1, Routing Loops & Solutions – Count to Infinity, Maximum, Split Horizon, Poison Reverse, Hold Down Timers, Triggered Updates, RIP V2, Routing vs. Routed Protocols, Autonomous Systems, Exterior and Interior Gateway Protocols, OSPF, VLANs, VTP, STA implementation with VLANS, Trucking.

5. Pre-requirements for this course (if any)**:**

201CCN-4

6. Co-requisites for this course (if any)**:**

N/A

7. Course Main Objective(s):

Prepare the students with the basic concepts of routing and switching so that he can Understand fundamental principles of Implementation for a LAN and WAN-approved network design.

Therefore, after a successful completion of this course, students should be able to:

- **Understand fundamental principles of Implementation for a LAN and WAN-approved network design.**
- **Configure a switch with VLANs and inter-switch communication.**
- **Create and Implement access lists to permit or deny specified traffic.**
- **Implement WAN links.**
- **Configure routing protocols on network devices.**
- **Perform LAN, WAN, and VLAN troubleshooting using a structured methodology and the OSI mode.**

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	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**	[2 contact hours ´ 15 weeks]	30
2.	**Laboratory/Studio**	[2 contact hours ´ 15 weeks]	30
3.	**Field**		
4.	**Tutorial**	[1 contact hour 15 weeks]	15
5.	**Others (specify)**		
Total			75

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Describe the concepts Operation of IP Data Networks.	K2	Lecture	Tests, Quizzes, and Assignments
1.2				
2.0	**Skills**			
2.1	Configure a switch with VLANs and inter-switch communication.	S1, S2, S4	Lecture, Lab	Tests, Quizzes, Assignments, and Lab
2.2	Implement WAN links.	S2, S5	Lecture, Lab	Tests, Quizzes, Assignments, and Lab
2.3	Configure routing protocols on network devices.	S2, S5	Lecture, Lab	Tests, Quizzes, Assignments, and Lab
2.4	Apply the knowledge and methods of cloud computing and distributed systems in programming.	S3, S5	Lecture, Lab	Tests, Quizzes, Assignments, and Lab
2.5	Perform LAN, WAN, and VLAN troubleshooting using a structured methodology and the OSI mode.	S2, S3	Lecture, Lab	Tests, Quizzes, Assignments, and Lab
3.0	**Values, autonomy, and responsibility**			
3.1	Implement Network Device Security	C3	Lecture, Lab	Tests, Quizzes, Assignments, and Lab
3.2				

C. Course Content

No	List of Topics	Contact Hours
1.	Operation of IP Data Networks	10
2.	LAN Switching Technologies	10
3.	IP addressing (IPv4 / IPv6)	10
4.	IP Routing Technologies	15
5.	IP Services	10
6.	Network Device Security	10
7.	WAN Technologies	10
	Total	**75**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	2,4,7,9	8%
2.	Assignments or mini project (presentation)	3,5,8,9	12%
3.	Midterm Examination	6th week	20%
4.	Lab Activities	2-14th week	10%
5.	Lab Final Examination	15th week	10%
6.	Final Examination	16th,17th week	40%

*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	Cisco CCNA Routing and Switching 200-125 Official Cert Guide Library (2016)
Supportive References	1. Jeff Doyle, Routing TCP/IP, Volume I, 2nd Edition Cisco Press, 2016. 2. Jeff Doyle, Routing TCP/IP, Volume II, 2nd Edition Cisco Press, 2016.
Electronic Materials	Available in Blackboard
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture Room and Laboratory
Technology equipment (projector, smart board, software)	Data show, PCs.
Other equipment (depending on the nature of the specialty)	Routing and switching Lab

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	• Indirect (questionnaire) • University online questionnaire for evaluation the course by students. • Observing the students opinions recorded on the college student site. - Appeal & suggestions box
Effectiveness of students' assessment	Peer reviewer	Direct (review of the quality of the exam done by the course coordinator) -
Quality of learning resources	Faculty & students	- Lecturers prepare and create the learning resources before the class begins and make them more related to the course. Questionnaire
The extent to which CLOs have been achieved	Faculty	Student assessments reviewing
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	NETWORK AND COMMUNICATIONS ENGINEERING DEPARTMENT COUNCIL
REFERENCE NO.	**14450824-0482-00014**
DATE	**5/3/2024**