2023
TP-153

Course Specification
(Bachelor)

Course Title:	Computer Networks
Course Code:	**CIT1202**
Program:	**Bachelor in Information Technology**
Department:	**Information Technology**
College:	**Faculty of Computer and Information Technology**
Institution:	**University of Tabuk**
Version:	**1.0**
Last Revision Date:	**27 July 2022**

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A. General information about the course:

1. Course Identification

1. Credit hours:					
3 CHrs. (Three-Credit Hours)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: Level 4/2nd Year					
4. Course general Description:					
This course provides a comprehensive introduction to computer networks with focus on the functions performed at each layer of the network architecture and common layer protocol standards. Topics covered include: introduction to computer networks and layered architectures: connectivity, topology, circuit and packet switching, TCP/IP and ISO models; Application layer: standard Client-Server protocols: DNS, SMTP, FTP, HTTP, network management protocols, multimedia streaming, Peer-to-Peer Paradigm; Transport layer: TCP and UDP, error control, congestion and flow control; Network layer: Internetworking, addressing and routing algorithms and protocols; Data link layer: Framing, medium access control.					
5. Pre-requirements for this course (if any):					
Computer Organization and Assembly Programming (CSC 1202)					
6. Co-requisites for this course (if any):					
NA					
7. Course Main Objective(s):					
▪ Build an understanding of the fundamental concepts of computer networking.					

- Familiarize the student with the basic taxonomy and terminology of computer networks,
- Develop a solid conceptual understanding of the essentials and design issues underlying a wide spectrum of modern computer network technologies with focus on the Internet model.
- Provide students with an opportunity to gain practical insights and hands-on experience on using networking hardware, software and tools.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Describe how computer networks are organized with the concept of layered approach.**	**K2**	**Lectures, textbooks, handouts, references. .**	**Exams, quizzes, assignments.**
1.2	**Define and explain**	**K2**	**Lectures,**	**Exams, quizzes,**

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
	the different types and characteristics of a Computer Network		textbooks, handouts, references. .	assignments.
1.3	Distinguish between OSI and TCP/IP models	K3	Lectures, textbooks, handouts, references. .	Exams, quizzes, assignments.
1.4	Create network addressing schemes using subnetting	K3	Lectures, textbooks, handouts, references. .	Exams, quizzes, assignments.
1.5	Explain network fundamentals and technologies	K3	Lectures, textbooks, handouts, references. .	Exams, quizzes, assignments.
2.0	**Skills**			
2.1	Design and implement computer networks with routers and switches.	S2, S4	Lectures, textbooks, handouts, references	Exams, quizzes, assignments
2.2	Design logical sub-address blocks with a given address block.	S2, S4	Lectures, textbooks, handouts, references	Exams, quizzes, assignments
3.0	**Values, autonomy, and responsibility**			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to computer networks Lab: Introducing the Wireshark packet sniffing tool	4
2.	Layered architectures: ISO and Internet models Lab: Introducing Ping program	4

3.	Application layer overview Lab: Introducing Traceroute and DNS Lookup tools	4
4.	Standard Client-Server Protocols: Telnet, HTTP Lab: Investigating various aspects of the HTTP protocol: the basic GET/response communication, HTTP message formats, requesting large HTML files, retrieving HTML files that have embedded objects, and HTTP security and authentication	4
5.	SMTP, DNS, FTP Lab: Exploring the client side of DNS using Wireshark	4
6.	Network Management Protocols: SNMP, Peer-to-Peer Paradigm	4
7.	Multimedia: streaming stored audio/video, multimedia applications, compression and quality of service	4
8.	Transport Layer: Overview & process to process delivery, UDP Lab: Exploring the UDP transport protocol using Wireshark	4
9.	TCP and Congestion control, Error and flow control Lab: Exploring the TCP transport protocol using Wireshark	4
10.	Network Layer: Internetworking, Addressing and Routing, NAT Lab: Investigate the behavior of the NAT protocol using Wireshark	4
11.	Network layer protocols: IP, Unicast and multicast routing Lab: Investigating the IP protocol using Wireshark, focusing on the IP datagram, and analyzing a trace of IP datagrams sent and received by an execution of the Traceroute program, exploring the fields in the IP datagram, and studying IP fragmentation in detail.	4
12.	Network layer protocols: ICMP Lab: Capturing the ICMP packets generated by the Ping program and analyzing them using Wireshark	4
13.	Data link layer: Framing, medium access control, ARP, configure switches and routers Lab: Investigating the Ethernet protocol and the ARP protocol using Wireshark	4
14.	Setup and configure LAN, WLAN, WAN, and VLAN Lab: Investigating the 802.11 wireless network protocol using Wireshark	4
15.	Setup various servers such as DNS, DHCP Lab: Investigating the DHCP protocol using Wireshark that is used extensively in organization, university, and home-network wired and wireless LANs to dynamically assign IP addresses to hosts	4
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,13	10
2.	Mid-term 1	5 or 6	20
3.	Mid-term 2	10 or 11	20
4.	Assignments	15	10
5.	Final Exam	16 or 17	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	▪ Data Communications and Networking, Behrouz A. Forouzan, McGraw-Hill Higher Education, ISBN: 0072967757 ▪ Cisco Networking Academy Program CCNA 1 and 2 Lab Companion, Cisco Systems Inc., Cisco Press, ISBN: 1-58713-149-8
Supportive References	▪ Computer Communications and Networking Technologies, M. A. Gallo and W. M. Hancock, Brooks/Cole, ISBN: 0-534-37780-7. ▪ Data and Computer Communications, W Stallings, Prentice Hall, ISBN: 0-02-415425-3 ▪ Computer Networking: A Top-Down Approach, Kurose, J. F., and K. W. Ross. Eight Edition. Harlow. (2021), ISBN: 978-1292405469.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, laboratories
Technology equipment	Data show

Items	Resources
(projector, smart board, software)	
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Course Assessment Survey conducted	Quality Assurance Committee	Indirect
CLO Assessment Survey	Instructor	Indirect
Direct Outcomes Assessment	Quality Assurance Committee	Direct
Teaching Assessment Survey	Quality Assurance Committee	Indirect
Course report	Quality Assurance Committee	Indirect

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	