



University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Computing & Information Technology
Program: B. Sc. in Computer Science

Course title	Introduction to Networks
Course code	CE231

Form no. (11A)
Knowledge and skills matrix for a course

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
Introduction	1	<ul style="list-style-type: none"> Define a Computer Network Define Network Protocol Discuss Computer network components 		<ul style="list-style-type: none"> Use ipconfig to determine the IP and network connection information 	Verify theory with practice
Computer Networks and Internet: Part 1	2	<ul style="list-style-type: none"> Discuss layered network architecture. Discuss OSI reference Model (Theoretical Model) Discuss TCP/IP model 	<ul style="list-style-type: none"> Compare between OSI and TCP/IP model Differentiate between the services offered by each layer 	<ul style="list-style-type: none"> Experiment with wireshark (packet sniffer) 	Verify theory with practice
Computer Networks and Internet: Part 2	3	<ul style="list-style-type: none"> Illustrate packet transmission through circuit switching and packet switching Define the delay, loss and throughput in packet-switching networks Discuss the protocol layers and their service models. 	<ul style="list-style-type: none"> Analyze different delays and throughput in packet-switched networks Compare between packet switching and circuit switching 	<ul style="list-style-type: none"> Experiment with wireshark (packet sniffer) 	Verify theory with practice

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
Application Layer: DNS, FTP and email	4	<ul style="list-style-type: none"> Define DNS tasks Illustrate how DNS works Discuss DNS records and messages Define FTP Illustrate how FTP works Illustrate how SMTP works 	<ul style="list-style-type: none"> Differentiate between the different internet applications and their underlying transport protocols Differentiate between iterative and recursive resolution 	<ul style="list-style-type: none"> Use wireshark packet sniffer to view DNS traffic Use nslookup to query DNS 	<ul style="list-style-type: none"> Verify theory with practice
Application Layer: HTTP	5	<ul style="list-style-type: none"> Illustrate an overview of the HTTP Define persistent and non-persistent HTTP connections Define Web caching 	<ul style="list-style-type: none"> Compare between persistent and non-persistent connections 	<ul style="list-style-type: none"> Use wireshark packet sniffer to view HTTP traffic 	<ul style="list-style-type: none"> Verify theory with practice
Transport Layer: Introduction and UDP	6	<ul style="list-style-type: none"> Discuss the Transport Layer services Discuss the Connection-less Transport: UDP 	<ul style="list-style-type: none"> Distinguish between the connection-oriented and connectionless transport layer protocols 	<ul style="list-style-type: none"> Use wireshark packet sniffer to view UDP traffic 	<ul style="list-style-type: none"> Verify theory with practice
7th week Exam	7				
Transport Layer: TCP	8	<ul style="list-style-type: none"> Discuss the Connection-oriented Transport: TCP 	<ul style="list-style-type: none"> Compare between and TCP and UDP Compute TCP acknowledgement number 	<ul style="list-style-type: none"> Use wireshark packet sniffer to view TCP traffic 	<ul style="list-style-type: none"> Verify theory with practice
The Network layer: The Internet Protocol	9	<ul style="list-style-type: none"> Discuss the network layer services Illustrate how IP addressing works 	<ul style="list-style-type: none"> extract network address and subnet address 	<ul style="list-style-type: none"> Use wireshark packet sniffer to view ICMP traffic 	<ul style="list-style-type: none"> Verify theory with practice
The Network layer:	10	<ul style="list-style-type: none"> Discuss Routing algorithms basics 	<ul style="list-style-type: none"> Analyze how different routing algorithms work 	<ul style="list-style-type: none"> Design and Implement a TCP/UDP network 	<ul style="list-style-type: none"> Verify theory with practice

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
Routing		<ul style="list-style-type: none"> Illustrate how routing in the internet works 		application	
The Network layer: Multicast	11	<ul style="list-style-type: none"> Discuss Multicast routing 	<ul style="list-style-type: none"> Compare between broadcasting and multicasting routing 	<ul style="list-style-type: none"> Design and Implement a TCP/UDP network application 	<ul style="list-style-type: none"> Verify theory with practice
12 th week exam	12				
The Link layer - Part I	13	<ul style="list-style-type: none"> Illustrate what is the link layer and its services 	Differentiate between multiple access protocols	<ul style="list-style-type: none"> Use wireshark packet sniffer to view ARP traffic 	<ul style="list-style-type: none"> Verify theory with practice
The Link layer - Part II	14	<ul style="list-style-type: none"> Illustrate what is the link layer and its services 			
Multimedia Networking	15	<ul style="list-style-type: none"> Discuss what is multimedia networking and its applications Demonstrate the streaming of audio and video 	<ul style="list-style-type: none"> Compare between the different audio and video compression techniques 	<ul style="list-style-type: none"> Design and Implement a multimedia networking application 	Verify theory with practice

Course Instructor

Name: **Dr Waleed Fakhr**

Signature:

Head of Department

Name: **Dr. Samah Senbel**

Signature: