



### Future Academy Higher Future Institute for Specialized Technological Studies

# **Course Specification**

## 1- Course information:

Course Code:	CSC431
Course Title:	Computer Network (2)
Year/level	4 <sup>th</sup>
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical = 2, Practical = 2, Total = 4)

### 2- Course aims:

The aim of the course "Computer Networks 2" is to complement the course "Computer Networks I", in order to deepen students' knowledge in Computer Networks and their functions. In particular, through this course the students will get familiar with the operation of the data link layer, the Medium Access Control (MAC) sub-level and the Logical Link Control (LLC) sub-level. Difference between LANs/MANs and WANs; Transmission media; LAN/MANs topologies The transport and session layers: Transport protects design issues, interconnection of packet-switching networks. The presentation layer: network security and privacy, text compression, virtual terminal protocols, file transfer protocols. Wireless and mobile networks: Propagation modes; Line of sight transmission: Impairments; Fading in wireless environment and error compensation methods. Cellular networks: Architecture; Organization; Frequency reuse; Operation; Functions- First generation mobile networks: AMPS (FDMA) – Second generation mobile networks: GSM (TDMA), IS-95 (CDMA); Third generation mobile networks (CDMA); Wireless LANs, etc.

## 3- Intended learning outcomes of the course (ILOs):

#### a- Knowledge and understanding:

## On successful completion of this course, the student should be able to:

al- Demonstrate deep knowledge of OSI & TCP/IP Models and different types of networking.

a2- Explain the various concept of data communication and techniques such as transmission media, data encoding/framing, error detection and correction, DLL protocols, IPv4, IPv6, TCP, UDP and routing and addressing.

a3- Explore the network requirements of components, transmissions medium and communication protocols to meet desired need.

a4- Compare between OSI model & TCP/IP protocols.

a5- Employ the various concept of data communication, techniques tools and equipment to build or

simulate a small network with acceptable levels of simplification.

a6- Implement different scenarios of computer network using simulation tools (packet trace or OPNET).

a7- Work effectively as a member of a group or individually to accomplish a common goal.

#### **b- Intellectual skills:**

#### On completing this course, the student should be able to:

b1- Explore the network requirements of components, transmissions medium and communication protocols to meet desired need.

b2- Compare between OSI model & TCP/IP protocols.

b3- Construct the bandwidth adjustment for small networks.

b4- Formulate the VLAN topologies for AdHoc networks.

#### c- Professional and practical skills:

#### At the end of this course, the student will be able to:

c1- Implement different scenarios of computer network using simulation tools (packet trace or OPNET).

c2- Employ the various concept of data communication, techniques tools and equipment to build or simulate a small network with acceptable levels of simplification.

#### d- General and transferable skills:

#### On successful completion of this course, the student should be able to:

d1- Work effectively as a member of a group or individually to accomplish a common goal.

#### 4- Course contents

Week	Topics/units	Number	of hours	ILO's		
No.	•	Lecture	Practical			
1.00		hours	hours			
1	Introduction	3	2	a1		
2	Network Models	3	2	a1		
3	Transmission Media	3	2	a2, c1		
	LAN/MANs topologies	3	2	a3, a4, b1, b2, c1		
4	Networks (LAN, MAN &					
	WAN)Data Link Layer +					
	Quiz 1					
5	Logical link control (LLC)	3	2	a3, a4, b1, b2, c2, d1		
5	Medium access control					
6	Flow control & Error control	3	2	a5, b1, b2, d1		
7	Midterm Exam	3				
8	Network layer protocols	3	2	a5, b1, b2, d1		

9	Wireless Network	3	2	a5, b1 ,b2, d1
10	Review and project discussion	3	2	a6, b1 , b2, b3, d1
11	Building LANs networks + Quiz 2	3	2	a7, b4 , c2
12	Networks setting and enhancement	3	2	a7, b4 , c2
13	Protocols used in VLANs	3	2	a7, c1
14	Final Revision	3	2	

# **5-** Teaching and learning methods

Methods	ILOs													
	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	c1	c2	d1
Lectures	V	V	√	V	V	V	V	V		V	V	√	√	
Practical sections									V	V	V	V	V	V
Self-learning														
Problem solving							V	V	V	V	V	V	√	
Assays and reviews														
Discussion groups								V						
Brainstorming														
Blended-learning														
E-learning														

# 6- Teaching and learning methods for Low-achieving students

- Additional teaching office hours for those who need help.
- More assignments to assess their ability for understanding the course.
- Encourage the teamwork for those students with other advanced ones to increase their participation and understanding.

## 7-Student assessment

Assessment method	Time	Grade weight (%)	Week	ILOs		
Course Work (	Through the	10	Every Week	a3, a4, a5, a6, a7, b2,		

Tutorial Exercise and Assignments)	semester			b3, b4, c1, c2, d1
Quiz 1	Through the lecture	5	Week#4	a1, a2,c1
Mid-term exam	1 hours	10	Week#7	a3, a5, c1, c2
Quiz 2	Through the lecture	5	Week#11	a3, a4 a5, a6, b3
Practical exam	2 hours	10	Week#14	b2, c1, c2, a7
Final Written exam	2 hours	60	Week# 15-16	a1, a2, a3, a4, a5, a6, a7, c1, c2

## **8-List of references**

#### 8.1. Student notebooks:

Comprehensive instructor notes ("PowerPoint slides") are available on the course web page ("Google Classroom")

#### 8.2. Essential textbooks:

- Computer Networks: A Systems Approach, Larry Peterson, Princeton University, Second edition ISBN: 888-876221908, 2015
- Computer Networking: A Top-Down Approach, James Venneris, ISBN: 201-9090023454, 2009

#### 8.3. Recommended textbooks:

 Network Programmability & Automation, Matt Oswalt, Fourth Edition, ISBN: 808-0774631928, 2008

#### 8.4. Journals, Periodical and Reports ......etc.

### 8.5. Websites

- https://www.javatpoint.com/computer-network-tutorial
- https://www.w3schools.com/whatis/default.asp

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