University: Benha University
Faculty: Faculty of Engineering at Shoubra
Department offering the program: Electrical Engineering Department
Department offering the course: Computer Systems Engineering Program

1- Course Data

Course Code: ECE 413C
Course Title: Computer Networks (1)
Semester/Year: First / Forth
Specialization: Computer Systems Engineering
Lecture: 3 **Practical/Practice:** 2
Total: 5

2- Course Aim

The aim of this course is to understand of the fundamental concepts and technology of computer networking and its components. In addition, the student will be familiar with the basic protocols of computer networks, and how they can be used to assist in network design and implementation. Moreover, understand the different error detection and correction algorithms.

3- Course Contents (As indicated in program Bylaw)

An introduction to the principles of communication networks, Network Standards, Phone Networks, ISDN and B-ISDN, Signals, LANS and WANS, Evaluating Networks performance.

4- Course Competencies (NARS)

Level (A) Engineering Competencies

A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.

Level (B) Electrical Engineering Competencies

B4. Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.

Level (C) Computer Engineering Competencies

C1. Apply the principles of computer programming, architecture, operating systems, networking, security, and embedded systems.

C2. Select and apply appropriate hardware and software tools, computing methods, design methodologies to develop computer systems.

5- Learning Outcomes (LO's)

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

	Cognitive Domain
LO1	Understand the fundamental concepts and technology of computer networking and its components, topologies, and protocols.
LO2	Define the layers of the OSI model and TCP/IP and the function(s) of each layer.
LO3	Identify the different types of network devices and their functions within a network
LO4	Differentiate the data encoding techniques and signal transmission models.
LO5	Apply the different error detection and correction algorithms.
LO6	Understand the concept of subnetting and supernetting.
	Psychomotor Domain
LO7	build networks with different devices using packet tracer simulation
LO8	Use packet tracer simulation for discussing the protocol message formate
	Affective Domain

LO9	Discuss the different routing algorithms

6- Mapping Learning Outcomes (LO's) with competences

LO's NARS	A3	B4	C1	C2
Cognitive Domain				
LO1			●	
LO2			●	
LO3				●
LO4			●	
LO5		●		
LO6	●			
Psychomotor Domain				
LO7				●
LO8				●
Affective Domain				
LO9		●		

7- Lecture Plan

a) Topics to be Covered weekly & Matrix of Competencies

Week	Topics	Planned Hours	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9
1	Introduction to computer networks	**5**	●	●							
2	Introduction to Application Layer	**5**				●					
3	HTTP-DNS Protocols	**5**	●		●						
4	Cash & Cookies	**5**		●							
5	P2P & Socket Programming	**5**							●		
6	Transport Layer Protocols	**5**		●							
7	Reliable Vs Unreliable	**5**		●						●	
8	Midterm										
9	Network Layer Protocols	**5**					●				
10	Routing Protocols	**5**			●				●	●	●
11	Data Link Layer	**5**		●							
12	Error Detection & Correction	**5**						●	●		
13	Ethernet & VLANS	**5**								●	●
14	Physical Layer	**5**		●					●	●	●

b) Additional private study/learning hours expected for students per week is Five hours

8- a) Teaching and Learning Methods

Course Competencies		Face-to-face Lecture	Online Education	Tutorial / Exercise	Group Discussions	Laboratory	Site Visit	Presentation	Mini Project	Research and Reporting	Brain Storming
Cognitive Domain	LO1	●								●	
	LO2	●								●	
	LO3	●									
	LO4	●									
	LO5	●									
	LO6	●		●	●						
Psychomotor Domain	LO7		●			●			●		
	LO8		●			●			●		
Affective Domain	LO9				●			●			

5- b) Teaching and Learning Methods of Disables

None

6- Student Academic Counseling and Support

- Students are directed to contact teaching staff for academic support during specific office hours.
- Regarding this course, I will be available for students for two hours a week as indicated on my time table declared for students from the beginning of the semester.

7- Student Assessment

a- Student Assessment Methods

	Course Competencies	Assessment Methods									
		Written Exams	Online Exams	Oral Exam	Quizzes	Lab Exam	Take-Home Exam	Research Assignments	Reporting Assignments	Project Assignments	In-class Questions
Cognitive Domain	LO1	●									
	LO2	●									
	LO3	●									
	LO4	●									
	LO5	●			●						
	LO6	●			●						●
Psychomotor Domain	LO7					●					
	LO8					●					
Affective Domain	LO9	●					●			●	

b- Assessment Schedule and Weight

Assessment	Week	Weight
Midterm Examination	8	20 %
Final Examination	(As Schedule)	60 %
Quizzes (2 times)	5,10	5 %
Home assignments, and Reports	4, 11	5%
Simulation project	15	10 %
Total		**100 %**

8- Facilities

The following facilities are needed for this course:
- ■ Classroom
- □ Lecture Hall
- □ Sound and Microphone
- □ Other: …………………

- □ Smart Board
- ■ White Board
- ■ Data Show

- ■ Computer with software
- ■ MIS system
- ■ Internet Access

9- List of References

a- Course Notes

Lectures Notes in PDF

https://benhashoubraeng.ekb.eg/courses/8210bb8b-8865-4367-ba73-56dec42cea00

b- Books

1. Computer Networking: A Top Down Approach 8th edition
2.

c- Extra Recommended Books

1. TCP/IP Protocol Suite (4th ed.) [Behrouz A. Forouzan]
2. Computer Networks a systems approach (5th ed.) [Larry L. Peterson and Bruce S. Davie]

d- Web Sites

https://benhashoubraeng.ekb.eg/courses/8210bb8b-8865-4367-ba73-56dec42cea00

- **Course Coordinator: Dr. Manal Mansour**   **Signature:**

- **Program Coordinator:**   **Signature:**