King Saud University

College of Computer and Information Sciences

Department of Computer Engineering

1. Course number and name: **CEN441, Computer Networks**

2. Credits and contact hours: **3 (3, 0, 1)**

3. Instructor's or course coordinator's name: Ridha Ouni

4. Text book, title, author, and year:

Computer Networking: A Top-Down Approach, J. Kurose and K. Ross, Pearson.

a. other supplemental materials:

Computer Networks, A. Tanenbaum, Pearson.

5. Specific course information

a. Course description (catalog)

Introduction to computer networks; Network architecture with respect to OSI and TCP/IP reference models; Ethernet, 802.11 technologies, Bluetooth, and cellular systems; Frame Switching and VLANs; Bridges and spanning trees; Basic network protocols: IPv4, ARP, DHCP, ICMP. Interior routing protocols. Transport layer protocols: UDP, TCP, and RTP.

This course introduces students to computer networks. It covers the concepts and algorithms used in medium access control of the link layer. In addition, it provides various concepts, technologies, and algorithms used in network and transport layers.

b. prerequisites or co-requisites: CEN341 (prerequisite).

c. Required, elective, or selected elective course: Required.

6. Specific goals for the course

a. Course Learning Outcomes: This course requires the student to demonstrate the following

1. Identify the essential network terminologies, devices, architecture and performance metrics.
2. Describe the Ethernet LAN protocol and the major wireless systems standards.
3. Demonstrate VLAN and spanning trees.
4. Compare virtual circuits and datagram networks.
5. Apply and conduct routing algorithms and packet forwarding protocols.
6. Apply and evaluate IP and addressing structure.
7. Apply and analyze the transport layer protocols TCP, UDP.

b. Relationship of Course to Student Outcomes:

Outcome	Student Outcome Description	Contribution
(a)	an ability to apply knowledge of mathematics, science, and engineering	√
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	√
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	√
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	√

7. Brief list of topics to be covered and schedule in weeks

Topic	Weeks
Identify the essential network terminologies, devices, architecture and performance metrics.	2
Describe the Ethernet LAN protocol and the major wireless systems standards.	2
Demonstrate VLAN and spanning trees.	2
Compare virtual circuits and datagram networks.	1
Apply and conduct routing algorithms and packet forwarding protocols.	2
Apply and evaluate IP and addressing structure. IP control protocols	3
Apply and analyze the transport layer protocols TCP, UDP.	2
Review and evaluation	1

8. Assessment Plan for the Course

Homework, Project, Quizzes	20%	
Lab	15%	
Midterm	25%	3 October 2022
Final exam	40%	Wednesday 22 / 04 / 1444 (16 Nov 2022)
	(including 5% Lab)	

9. Tentative out of class assignments and dates

Homework 1:   Familiarize with performance metrics application and measurements.
Homework 2:   Discover LAN and wireless LAN scenarios and evaluate performance.
Homework 3:   Apply spanning tree algorithm & VLANs.
Homework 4:   Apply routing algorithms.
Homework 5:   Apply IP subnetting. Discover IP, ARP, ICMP and DHCP protocols.
Homework 6:   Discover transport layer protocols: TCP & UDP.

- Lecture notes will be posted in LMS page.
- Homework assignments must be done individually and submitted no later than the specified date.
- A set of 4 to 5 quizzes have to be achieved within the semester.

10. Current Instructor, Department, office hours and date:

Dr. Ridha Ouni
Department of Computer Engineering
Bldg: 31, room: 2193
Online Office hours: by appointment via email.
Email: rouni@ksu.edu.sa
Office Phone: 0114698671
Date. 17-1-2021