Course Syllabus

Course ID	0902507
Course Title	**Computer Networks**
Prerequisite	
Time & Date	**13:00qm – 14:00pm (Room)**
Coordinator	-
Instructor	**Assistant. Prof. Dr. Takialddin Al-Smadi** Faculty of Engineering E-mail:dsmadi@rambler.ru Telephone: ext.
Office hours	
Course Description	Data communications and ISO Model. Open system standard. Circuit switching and packet switching he physical layer and the electrical interface. Transmission media types. Attenuation and distortion sources. Noise signal delay and bandwidth. Data transmission. Error detection and control. LAN topologies and types. The Internet. Bridges and repeaters. Routers and switches. Introduction to WAN and internet. The X-25protocol. TCP/IP suite and applications.
Course Objectives	

1. Learn the computer networking concepts, basic terminology, and applications.	10%
2. Understand the Internet architecture, components, services, and measures of performance.	10%
3. Understand the application-layer concepts, protocol principles, transport-layer interfaces, and network applications such as the W E B and H T T P and the FTP.	10%
4. Understand the transport-layer concepts, relationship with the network- and application-layers, and services such as the principles of Reliable Data Transfer.	15%

	5. Understand the network-layer concepts and routing principles, algorithms, and protocols.	25%
	6. Understand the data link-layer concepts, protocols, and services such as error-detection and correction, addressing, and multiple-access techniques.	25%
	7. Learn the main concepts of wireless and mobile networks.	5%

Course Outcomes

1	Use the basic computer networking terminology to describe the different components, services, and applications provided of the Internet.
1, 2	Describe the main design issues related to network engineering such as scalability, reliability, efficiency, and cost-effectiveness.
1, 2	Identify the potential methodologies that can be used to resolve the network design issuessuch as statistical multiplexing, multiple access, and and forwarding.
1, 2	Define the roles of the major components of the computer networks and the Internet such as the host, router, network application, protocol, and network services.
1, 2	Define the major functions of the layers in the network stack such Internet stack.
3 - 6	Describe the operation of the major Internet protocols such as the HTTP, DNS, DHCP, TCP, UDP, IP, and ICMP.
3 - 6	Calculate the major network measure of performance metrics such as packet delay, link utilization, and throughput.
3	Differentiate between the application layer protocol and the network application.
3	Write basic network applications using sockets.
4	Describe the main principles of reliable data transfer, the algorithms used, how the TCP, for example, employs such principles to provide reliable data transfer service.
3 – 6	Differentiate between the addressing information used in each network and their corresponding functions such as port numbers, IP addresses, and MAC addresses.
5, 6	Differentiate between internetworking devices and their functions such

			switches, and routers.
		4	Describe the major internal components of a packet router and their corresponding functions and identify the role each performance of the router.
		5	Describe the operation of the IP protocol and how the hierarchical of IP addresses facilitates the routing of the packets across the network.
		5	Differentiate between the virtual-circuit networks and the datagram and describe the operation principles of each.
		6	Differentiate between the multiple-access techniques and protocols, the principle of operation for each, and the advantages and disadvantages of
		7	Describe the main components of a wireless network.
		7	Describe the operation of the known WLAN, WPAN, and cellular protocols.
		1 - 7	Design a cost-effective network layout for an organization needs and the expected traffic behaviors. The design includes dividing the network into subnets and LAN segments, acquiring, and managing static and dynamic IP addresses, using DHCP server(s), proxy servers, using NAT, etc.

Course Topics

Week	Topics	Chapter in Text
1+2	Design issues related to computer networks and the Internet	Slides
3	Introduction to computer networks and the Internet	Chapter 1
4+5	The application-layer concepts, services, and protocols	Chapter 2
6+7	The transport-layer concepts, services, and protocols	Chapter 3
8+9+10	The network-layer concepts, services, and protocols	Chapter 4
11+12+13	The data link-layer concepts, services, and protocols	Chapter 5
14+15	The wireless and mobile networks	Chapter 6
16	Review and evaluations	Exams

Text Book	l-Data **Communications, Computer** Networks, **and Open Systems (Electronic Systems Engineering Series) (ISBN: 0201565064)** Fred **HalsallAddison-Wesleyl992** **2-Corrspyter network architectures** (Electrical engineering communications and signal processing series) **(ISBN:0273017098)** Anton **MeijerComputer Science Press, 1983.** **3-Imp!ementing Wireless Networks** (Mcgraw-HUI **Series on Computer Communications) (ISBN: 0070463778)** Martin A. W. **NemzowMcgraw-Hill (Tx), 1995** 4-Computer **Networks (ISBN: 0131756052)** Uyless **BlackPrentice Hall, 1993** ***5*- Computer Networks &** Internets- **(ISBN0130836176:** Douglas E. Comer Ralph E. Dromss
Course References	Data Communications & Networking, Behrouz A. Forouzan, McGraw-Hill http://wps.aw.com/aw_kurose_network_3
Course delivery	Lectures Tutorial Lab Homework Project Computer Internet Industrial Visit
Course Assessment	**First Exam : 20%** **Second Exam: 20%** **Quizzes : 10%** **Final Exam : 50%** **Total : 100%**
Updated	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12
CO1											
CO2											
CO3											
CO4											

CO5											
CO6											
CO7											
CO8											
CO9											

	a	b	C	D	e	f	g	h	i	j	K
CO1											
CO2											
CO3											
CO4											
CO5											
CO6											
CO7											
CO8											
CO9											

ABET a-k Engineering and Technology program outcome

(a) An ability to apply knowledge of mathematics, science, and engineering
(b) An ability to design and conduct experiments, to analyze and interpret data
(c) An ability to design a system, component, or process to meet desired needs
(d) An ability to function on multi-disciplinary 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 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

Plagiarism

Deliberate plagiarism is a serious act of academic misconduct. Students may be suspended from the University if they are found to have plagiarized their course work. Whether inadvertent or deliberate, plagiarism includes the following:

(a) word-for-word copying of sentences or whole paragraphs or presenting of substantial extracts from either paper-based or electronic sources the work or data of others that are published or unpublished (such as books, internal reports, and lecture notes or tapes) without clearly indicating their origin;
(b) using very close paraphrasing of sentences or whole paragraphs without due acknowledgement in the form of reference to the original work;
(c) submitting another student's work in whole or in part;
(d) using of another person's ideas, work or research data without acknowledgement;
(e) copying computer files, algorithms or computer code without clearly indicating their origin;
(f) submitting work that has been written by someone else on the student's behalf; and
(g) submitting work that has been derived, in whole or in part, from another student's work by a process of mechanical transformation (e.g., changing variable names in computer programs).