Module (Computer Network and Security) Catalogue

2022-2023

College/ Institute	Erbil Technology College	
Department	ICT	
Module Name	Computer Networks and Security	
Module Code	CNS402	
Degree	Technical Diploma [x] Bachelor [ ] High Diploma [ ] Master [ ] PhD [ ]	
Semester	4rd	
Qualification	Master degree in computer science	
Scientific Title	Lecture	
ECTS (Credits)	6	
Module type	Prerequisite [ ] Core [x] Assist. [ ]	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(91)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	(71)Total hrs Workload
Number of Weeks	12	
Lecturer (Theory)	Shereen Abdullah Anwar	
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Lecturer (Practical)	Shereen Abdullah Anwar-Mohammad Ali	
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Websites	-------	

Course Book

Course Description	The objective of this course is to provide students with knowledge about the basic concepts and techniques used in computer networks; they will learn how the internet works and understand how network infrastructure and services can be put in place and managed. Students will learn the internals of the TCP/IP protocol suite and its implementation in computers and other equipment and: Explain the following terms: computer network, LAN, WAN, MAN, internet, protocol, topology, media, peer-to-peer network, server based network. Describe the roles a computer can play in a computer network. Give an overview of the main types of media used in local area networks. Describe how the different devices used to communicate through a network work and in what, circumstances they are used.Also in the lab we will introduce our student how to design a virtual network using Packet trace program.
Course objectives	1. This course to learn students to be able to an understanding of the physical properties and performance characteristics of communication media; specifically cable and wireless networks, type of computer network, including appreciation of protocol layer models an enhancements to those standards. To be able to demonstrate an appreciation of the theory and practice of common local area networks including wireless LANs WAN and later discuss the software needed. The network hardware is made up of two basic components: the entities that want to share the information or resources. Such as servers and workstations, and the medium that enables the entities to communicate, which is a cable or a wireless medium and learn students to be able to an understanding definition of OSI,E-mail, network security, what are the main devices that are needed for Network and how configured TCP/IP.
Student's obligation	▪ Students attending classes regularly. ▪ Group work. ▪ Doing assignments. ▪ Class activities.
Required Learning Materials	Lecture halls with data show equipment for lecture presentations, white board, overhead projector, posters.

Evaluation	**Task**		**Weight (Marks)**	**Due Week**	**Relevant Learning Outcome**
	Paper Review		0		
	Assignments	Homework	5		
		Class Activity	2		
		Report	0		
		Seminar	5		
		Essay	0		
		Project	10		
	Quiz		4		
	Lab.		14		
	Midterm Exam		20		
	Final Exam		40		
	Total				
Specific learning outcome:	1- To be able to an understanding of the physical properties and performance characteristics of communication media; specifically cable and wireless networks, type of computer network, including appreciation of protocol layer models an enhancements to those standards. 2- The medium that enables the entities to communicate, which is a cable or a wireless medium and learn students to be able to an understanding definition of OSI. How to design a virtual network using Packet trace program.				
Course References:	1- Dr. Bashar M. Ne'mA, ComputerNetworks2013-2014 , Department of Computer Science Semester (1). 2- William stallings ``Data and Computer Communications ``. 3- B. A. Forouzan, "TCP/IP Protocol Suite", Tata McGraw Hill edition, Third Edition. 4- N. Olifer, V. Olifer, "Computer Networks: Principles, Technologies and Protocols for Network design", Wiley India Edition, First edition. 5- W. Richard Stevens, "TCP/IP Volume1, 2, 3", Addison Wesley. 6- Andrew S. Tanenbaum, Computer Networks, Pearson Education Web Site: 1- www.4electron.com. 2- http://kluweronline.com 1. www.uotechnology.edu.iq/dep-cs. .				

Course topics (Theory)	Week	Learning Outcome
Introduction to computer Networks Basic network Network classification Network categories according to - Geographical coverage - architecture Identifying network topologies	1-2	LAN,WAN,MAN Peer – to – peer Server-client. Bus topology - Star topology - Ring topology Mesh topology
Access Methods Networking components	3-4	CSMA/CD CSMA/CA Token Passing Network interface cards MAC address Hubs- Repeaters Bridges-Switches Routers
The OSI model (1)	5-6	physical layer data link layer network layer transport layer
The OSI model (cont….)	7	session layer presentation layer application layer
TCP/IP Model (1)	8	Understanding Binary Address Classes
IOT	9	Introduction to IOT
Network Security	10-11	Introduction to Network security and IP address…hacking
Wireless network Security, mobile network Security	12	Introduction about wireless network

Practical Topics	Week	Learning Outcome
What computers need to be a part of networks	1	
Network media and connectors IP address	2	Coaxial cable Twisted –config/ Design peer to peer network then Share data between two device

3- IP configration		
4- Practical Application for network device(Activity)		
Packet Tracer	5	Introduction to Packet Tracer
Packet Tracer	6	-Design & Configuring LAN Topology.
Packet Tracer	7,8,9	- Connect Two PC,PC to HUB, PC to Switch ,PC to Router AND Switch to PC, Switch to Switch, Switch To Router AND Router to Router, Router To Switch……and so on
Packet Tracer	10	- Connect Two LAN
Packet Tracer	11,12	- Router's Initial Configurations. Configuring Router's LAN, wireless router

Questions Example Design

Q1: What is the OSI reference. What are the layers of OSI ,Then Describe two of these layers

Answer:

7.Application, 6 Presentation,5 Session, 4 Transport,3 Network,2 Data-Link,1 Physical(The Physical Layer)

The Physical layer (layer 1) controls how the digital information is transmitted between nodes. In this layer, the *encoding* technique, the type of connector used**.**

Q2) compare between Lan and wan?

Q3)design a network for lab (using ip class B)

Extra notes:

Making the topics covered in the semester compatible with reality of the educational . Covering more than 80% of the prescribed subjects to improve the scientific level of students and preserve the standardization of diploma programs.