ICT 4255: Computer Network

Course Details

Course Code: ICT 4255
Course Title: Computer Networks
Course Type: Core Course
Academic Session: January-June,2023
Course Teacher: Md. Toukir Ahmed
Pre-requisite: Data Communication
Credit Value: Credit Hours: 3.00
Contact Hours: 3.00
Total Marks: 100

Rationale of the Course:

This course is designed to understand the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks. Resource sharing, high Reliability, increase in system performance, and security in network are the main objectives.

Course Objectives:

1. To describe the major computer networks components and How Internet works?
2. To understand how HTTP, Email, Web, and DNS work.
3. To understand the transport layer
4. To design and implement IP and routing protocol

Mapping of Course Outcomes (COs) with the Program Outcomes (POs):

No.	Course Learning Outcome	Program Outcome											
		1	2	3	4	5	6	7	8	9	10	11	12
CO1	Describe the major computer networks components and How Internet works.	Y											
CO2	Illustrate TCP/IP protocol (Application, Transport, Network, Link and Physical) used in internetworking to develop network application		Y										
CO3	Design and implement network routing for IP networks selecting different routing protocol.			Y									
CO4	Develop the communication skill by presenting topics on Computer networking.										Y		

Course Plan:

Week	Lecture	Topics	**Teaching-Learning Strategy**	**Assessment Strategy**	**Corresponding COs**
1	1	Introduction, Computer network and the Internet.	Lecture, Tutorials, Discussion	CT1	CO1
	2	OSI reference model			
	3	TCP/IP model and terminology	Lecture, Tutorials, Discussion		
2	4	Hubs, Bridges, Repeater	Lecture, Tutorials, Discussion		
	5	Router and Switches,	Lecture, Tutorials, Discussion		
	6	Circuit switching and Packet switching	Lecture, Tutorials, Discussion		
3	7	Frame relay and Cell relay	Lecture, Tutorials, Discussion	CT2	CO2, CO3
	8	ATM reference model.	Lecture, Tutorials, Discussion		
	9	Internet address, classfull address	Lecture, Tutorials, Discussion		
4	10	subnetting	Lecture, Tutorials, Discussion		
	11	VLSM	Lecture, Tutorials, Discussion		
	12	ARP, RARP, IP, ICMP.	Lecture, Tutorials, Discussion	MID	CO2, CO3
5	13	Pure and slotted ALOHA	Lecture, Tutorials, Discussion		
	14	Persistent and Non persistent CSMA	Lecture, Tutorials, Discussion		
	15	CSMA with collision detection	Lecture, Tutorials, Discussion		
6	16	collision free protocols	Lecture, Tutorials, Discussion		
	17	IEEE standard 802.3 and Ethernet	Lecture, Tutorials, Discussion		
	18	Types of errors, framing	Lecture, Tutorials, Discussion		
7	19	error detection & correction methods Flow control, Stop & wait ARQ	Lecture, Tutorials, Discussion		
	20	Go-Back- N ARQ,	Lecture, Tutorials, Discussion		

	21	Selective repeat ARQ	Lecture, Tutorials, Discussion		
	22	UDP	Lecture, Tutorials, Discussion		
	23	TCP	Lecture, Tutorials, Discussion		
	24	Connection management, Addressing, Establishing and Releasing Connection,	Lecture, Tutorials, Discussion		
9	25	Congestion control algorithm	Lecture, Tutorials, Discussion		
	26	Flow control and Buffering	Lecture, Tutorials, Discussion	CT3	
	27	Multiplexing	Lecture, Tutorials, Discussion		CO2, CO3
10	28	Data Compression techniques, Frequency Dependent Coding	Lecture, Tutorials, Discussion		
	29	Context Dependent Encoding	Lecture, Tutorials, Discussion		
	30	Internet and intranets, Internet services and goals	Lecture, Tutorials, Discussion		
11	31	DNS, SMTP	Lecture, Tutorials, Discussion		
	32	FTP, Telnet, HTTP	Lecture, Tutorials, Discussion		
	33	World Wide Web (WWW), DHCP	Lecture, Tutorials, Discussion		
12	34	shortest path algorithm, flooding	Lecture, Tutorials, Discussion		
	35	distance vector routing	Lecture, Tutorials, Discussion		CO2, CO3
	36	link state routing	Lecture, Tutorials, Discussion		
13	37	Name servers; Email and Its privacy, Network security	Lecture, Tutorials, Discussion		
	38	Authentication; Digital signatures, Principles of Reliable Data Transfer FTP	Lecture, Tutorials, Discussion		

	39	Proxy server, FTP server, E-mail server, web server, DB server	Lecture, Tutorials, Discussion		
14	40	NAT	Lecture, Tutorials, Discussion		
	41	Firewall	Lecture, Tutorials, Discussion		
	42	**Review Class**	Discussion		
Final Exam					CO1, CO2
Learning Materials					
Reference books					
1. Computer Networking: A Top-Down Approach by James F. Kurose and Keith W. Ross. 7th /8th Edition 2. Data Communications and Networking by Behrouz A.Forouzan, 4th / 5th Edition					
Reference Site					