



Course Identification and General Information						
1	Course Title & Code:	Computer Network I				
2	Credit hours:	C.H			TOTAL	
		Th.	Seminar	Pr.		Tr.
		2	NA	2	NA	3
3	level/ semester at which this course is offered:	4 th level, 1 st and 2 nd semesters				
4	Program (s) in which the course is offered:	Electrical Engineering				
5	Language of teaching the course:	English/Arabic				
6	Lecture	Associate En /azaldeen. Algalal				

Syllabus

1. Overview of data communication and Networking:

Introduction; Data communications: components, data representation (ASCII, ISO etc.), direction of data flow (simplex, half duplex, full duplex); Networks: distributed processing, network criteria, physical structure (type of connection, topology), categories of network (LAN, MAN, WAN); Internet: brief history, internet today; Protocols and standards; Reference models: OSI reference model, TCP/IP reference model, their comparative study.

2. Physical layer:

Overview of data (analog & digital), signal (analog & digital), transmission (analog & digital), Bit Rate, Bit Length, Transmission Impairment, data rate



limits, Performance, Bandwidth, Throughput, Latency (Delay), Bandwidth-Delay Product

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Jitter, transmission media (guided & non-guided); Circuit switching, Datagram Networks, Virtual-Circuit Networks, structure of a switch, Internetworking & devices: Repeaters, Hubs, Bridges, Switches, Router, Gateway; Addressing types.

3. Data link layer:

Error Detection and Correction: introduction, BLOCK CODING, LINEAR BLOCK CODES, CYCLIC CODES, Checksum code

Data Link Control: framing (character and bit stuffing),; Flow control;

Protocols: Stop & wait ARQ, Go-Back- N ARQ, Selective repeat ARQ,

Medium access sub layer: RANDOM ACCESS: ALOHA, Carrier Sense Multiple Access (CSMA), Carrier Sense Multiple Access with Collision Detection (CSMA/CD), Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)- CONTROLLED ACCESS: Reservation, Polling, Token Passing.

Network layer

Logical Addressing, IPv4 Addresses, IPv6 Addressing, Transition From IPv4 to IPv6.

Routing : techniques, static vs. dynamic routing , routing table for classful address;

Address Mapping: ARP, RARP, BOOTP, and DHCP.

Error Reporting and Multicasting: ICMP, IGMP.

UNICAST ROUTING PROTOCOLS: Optimization, Intra- and Interdomain Routing, Distance Vector Routing, Link State Routing, Path Vector Routing.

Transport layer:

Process to process delivery; UDP; TCP; Congestion control algorithm.

Application layer:

DNS; Remote Logging, Electronic Mail, and File Transfer

Textbook:

B. A. Forouzan "Data Communications and Networking (5th Edition)
McGraw-Hill, 2013

Reference Books:

Kurose and Rose "Computer Networking -A top down approach
featuring the internet", 7th Edition, Pearson Education, 2017.

A. S. Tanenbaum, Computer Networks (5th Edition), Pearson
Education/PHI, 2014

B. A. Forouzan, TCP IP Protocol Suite, 4th Edition, McGraw-Hill,
2010

Electronics references:

Some notes will be prepared by lecturer

<https://ocw.mit.edu/courses>

<https://nptel.ac.in/courses/106/105/106105082/>

<https://www.networking-forums.com/>

تم الاشراف بواسطة الدكتور الفاضل

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خالد الصوفي

نائب العميد في كلية الهندسة جامعة اب



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