

Department of Computer Engineering			
Computer Networks I (66454)			
Total Credits		3	
major compulsory			
Prerequisites		P1 : Computer Architecture I (66323)	
Course Contents			
1. Introduction to Computer Networks Historical Background Protocols, Layers, and Interface. Models: ISO/OSI and TCP/IP Internet Models. LANs, WANs and the Internet Reliable and Unreliable Service Connection Oriented Versus Connectionless Oriented protocols Overview of network layers, protocols, and services 2. Application Layer Network and Internet Applications. Application Paradigms: Client/server and P2P Web and HTTP File Transfer and SMTP Electronic mail: SMTP, POP3 and other email protocols. Domain Name System (DNS). Socket Interface and Programming. 3. Transport Layer Transport Layer Services. UDP Protocol TCP Protocol. Error Control: Error Detection and Corrections. Flow Control: Stop and wait, sliding window Congestion Control 4. Network Layer Network Layer Services overview: Addressing and Routing. Virtual Circuits and Datagram Networks. IP Protocol: IPV4, IPV6. IP Addressing and Subnets ICMP Protocol DHCP and NAT Routing Protocols: IGP, EGP Protocols Distance Vector Routing. Link State Routing. Exterior Gateway Routing Protocol : BGP 5. Link Layer and LANs Link Layer Services: Framing, addressing, error detection, error correction. Error Detection and Correction: CRC, Hamming codes. Multiple Accesses Protocols. CSMA/CD, CSA/CA Local Area Networks Overview: Ethernet, Token Ring. LAN: Ethernet Details and Wireless LANs. LAN Switches. ARP Protocol 6. Physical Layer Media: Copper, Wireless, and Fiber Coding Nyquist Theorem Shannon Theorem.			
Intended Learning Outcomes (ILO's)		Student Outcomes (SO's)	Contribution
1	Acquire Fundamental knowledge of computer networks technologies, applications, data transmission & switching, network layers and protocols.	C	30 %
2	Acquire knowledge and skills in network analyses, design of network applications, and network programming at the application and transport layer with emphasis on the TCP/IP Stack.	E	25 %
3	Acquire advanced knowledge of computer network addressing, routing, switching, congestion control and various aspects of network and transport layer functions and protocols.	K	25 %
4	Acquire knowledge of network encoding, framing, data-link layer functions and Local Area Networks.	K	20 %
Textbook and/ or References			
Textbook: James F.Kurose &Keith W. Ross, Computer Networking- A Top down Approach Other references: Andrew Tannenbaum, Computer Networks. Comer: Computer Networks and Internets.			
Assessment Criteria		Percent (%)	
First Exam		20 %	
Second Exam		20 %	
Projects		15 %	
Final Exam		45 %	
Course Plan			

Week	Topic
1	Introduction to Computer Networks, Protocols, Layers, and Services
2	Protocols, Layering, ISO and TCP/IP models. Application Layer Introduction.
3	Application Layer: Paradigms, Web, HTTP, Email, Ftp, DNS, P2P applications.
4	Socket Programming and Network Programming
5	Transport Layer: TCP and UDP Protocols.
6-7	Transport Layer: Error control, Flow Control, congestion control. Midterm Exam1
8	Addressing, Forwarding, Virtual circuits and Datagrams, IPV4, IPV6
9	ICMP, DHCP, NAT
10	Routing Protocols: IGP, EGP Protocols
11	Distance Vector and Link State Routing Protocol
12	Exterior Gateway Routing Protocol : BGP
13	Midterm Exam 2 Link Layer Services, Framing, Addressing and Error control
15	Multiple Access Protocols, LANs, Ethernet and Token Ring LAN switching and ARP
16	Physical Layer