

Course code	Course Name	L-T-P - Credits	Year of Introduction
CS306	Computer Networks	3-0-0-3	2016
Prerequisite: Nil			
Course Objectives			
<ul style="list-style-type: none"> • To build an understanding of the fundamental concepts of computer networking. • To introduce the basic taxonomy and terminology of computer networking. • To introduce advanced networking concepts. 			
Syllabus			
Concept of layering, LAN technologies (Ethernet), Flow and error control techniques, switching, IPv4/IPv6, routers and routing algorithms (distance vector, link state), TCP/UDP and sockets, congestion control, Application layer protocols.			
Expected Outcome			
The students will be able to			
<ol style="list-style-type: none"> i. Visualise the different aspects of networks, protocols and network design models. ii. Examine various Data Link layer design issues and Data Link protocols. iii. Analyse and compare different LAN protocols. iv. Compare and select appropriate routing algorithms for a network. v. Examine the important aspects and functions of network layer, transport layer and application layer in internetworking. 			
Text Books			
<ol style="list-style-type: none"> 1. Andrew S. Tanenbaum, Computer Networks, 4/e, PHI. 2. Behrouz A. Forouzan, Data Communications and Networking, 4/e, Tata McGraw Hill. 3. Larry L. Peterson & Bruce S. Dave, Computer Networks-A Systems Approach, 5/e, Morgan Kaufmann, 2011. 			
References			
<ol style="list-style-type: none"> 1. Fred Halsall, Computer Networking and the Internet, 5/e. 2. James F. Kurose, Keith W. Ross, Computer Networking: A Top-Down Approach, 6/e. 3. Keshav, An Engineering Approach to Computer Networks, Addison Wesley, 1998. 4. Request for Comments (RFC) Pages - IETF -https://www.ietf.org/rfc.html 5. W. Richard Stevens. TCP/IP Illustrated volume 1, Addison-Wesley, 2005. 6. William Stallings, Computer Networking with Internet Protocols, Prentice-Hall, 2004. 			
Course Plan			
Module	Contents	Hours	End Sem. Exam Marks
I	Introduction – Uses – Network Hardware – LAN –MAN – WAN, Internetworks – Network Software – Protocol hierarchies – Design issues for the layers – Interface & Service – Service Primitives. Reference models – OSI – TCP/IP.	07	15%
II	Data Link layer Design Issues – Flow Control and ARQ techniques. Data link Protocols – HDLC. DLL in Internet. MAC Sub layer – IEEE 802 FOR LANs & MANs, IEEE 802.3, 802.4, 802.5. Bridges - Switches – High Speed LANs - Gigabit Ethernet. Wireless LANs - 802.11 a/b/g/n, 802.15.PPP	08	15%
FIRST INTERNAL EXAMINATION			

III	Network layer – Routing – Shortest path routing, Flooding, Distance Vector Routing, Link State Routing, RIP, OSPF, Routing for mobile hosts.	07	15%
IV	Congestion control algorithms – QoS. Internetworking – Network layer in internet. IPv4 - IP Addressing – Classless and Classfull Addressing. Sub-netting.	07	15%
SECOND INTERNAL EXAMINATION			
V	Internet Control Protocols – ICMP, ARP, RARP, BOOTP. Internet Multicasting – IGMP, Exterior Routing Protocols – BGP. IPv6 – Addressing – Issues, ICMPv6.	07	20%
VI	Transport Layer – TCP & UDP. Application layer –FTP, DNS, Electronic mail, MIME, SNMP. Introduction to World Wide Web.	07	20%
END SEMESTER EXAM			

Question Paper Pattern

1. There will be *five* parts in the question paper – A, B, C, D, E
2. Part A
 - a. Total marks : 12
 - b. Four questions each having 3 marks, uniformly covering modules I and II; Allfour questions have to be answered.
3. Part B
 - a. Total marks : 18
 - b. Three questions each having 9 marks, uniformly covering modules I and II; Two questions have to be answered. Each question can have a maximum of three subparts.
4. Part C
 - a. Total marks : 12
 - b. Four questions each having 3 marks, uniformly covering modules III and IV; Allfour questions have to be answered.
5. Part D
 - a. Total marks : 18
 - b. Three questions each having 9 marks, uniformly covering modules III and IV; Two questions have to be answered. Each question can have a maximum of three subparts
6. Part E
 - a. Total Marks: 40
 - b. Six questions each carrying 10 marks, uniformly covering modules V and VI; four questions have to be answered.
 - c. A question can have a maximum of three sub-parts.
7. There should be at least 60% analytical/numerical questions.