

Branch Name:	Computer Engineering / Information technology
Semester/Year:	Semester VII / Final Year
Subject Title:	Advanced Computer Network (Elective-III)
Subject Code:	1ET1030709
Pre-requisite:	Computer Network

Course Objective:

- The course is aimed at providing basic understanding of Computer networks starting with OSI Reference Model, Protocols at different layers with special emphasis on IP, TCP & UDP and Routing algorithms.
- Some of the major topics which are included in this course are LANs/WANs, internetworking technologies, Routing and Addressing.
- Provide the mathematical background of routing protocols.
- Aim of this course is to develop some familiarity with current research problems and research methods in advance computer networks.
- The course also aims in the area of Advanced Concepts in Networks like Adhoc Networks, Mobile Adhoc Networks, Sensor Networks, Delay Tolerant Networks and cisco IOS.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
04	-	02	05	70	30	30	20	150

Subject Contents			
Sr. No	Topic	Total Hours	Weightage (%)
1	Fundamental of computer Network : Introduction, Protocols and standards: Definition and Uses of Computer Network, Classification of Computer network & Topology, Network Architecture, Internet Standards, Internet Administration; Overview of reference models: The OSI model, The OSI Reference Model, TCP/IP protocol Suite, The TCP/IP Reference Model, Comparison of the OSI & the TCP/IP Reference Models, Basic of IP versions & Addressing, Transceivers and Media converters, Network interface cards and PC cards, Repeaters, Hubs, Bridges, Switches, Routers and Gateways etc.	7	15
2	Optical Networking & Multiplexing: SONET/SDH standards, Dense Wavelength division multiplexing (DWDM), Performance and design Considerations, Multiplexing, Types of Multiplexing- FDM, TDM, SM; - Ethernet, token ring, FDDI; switching - circuit switching, packet switching, multicasting.	9	20
3	Packet Switching Protocol: X.25, theory of Operation and Network Layer functions, X.75, Internetworking protocols, SMDS, Subscriber Interface	7	15

	and Access Protocol, Addressing and Traffic Control Common Protocols and interfaces in upper Layer: TCP/IP suite, Network Layer, Transport Layer, Applications Layer, Addressing and routing design, Socket programming		
4	Routing in the Internet: Intra and interdomain routing; Unicast. Routing Protocols: RIP, OSPF, BGP; Multicast Routing Protocols: MOSPF, DVMRP, Drawbacks of traditional routing methods, Idea of TE, TE and Different Traffic classes. IP over ATM, Multi-protocol Label switching (MPLS), Storage Area Networks (SAN).	7	16
5	Network Management and Quality of Service: Introduction to Network Management, Standard Network Management Protocol, Applications and Quality of service, Queue Analysis, Queue Management Algorithms.	5	14
6	Advanced Concepts in Networks: Over View of Cellular Networks, Adhoc Networks, Mobile Adhoc Networks, Sensor Networks, Virtual Private Networks .Delay Tolerant Networks DTN,	5	10
7	Introduction to the Cisco IOS: The Cisco Router User Interface, Command Line Interface (CLI) Router and Switch Administrative Functions, Router Interfaces, Viewing, Saving, and Erasing Configurations	5	10

Course Outcome:

After learning the course, the students should be able to understand the basic concept of computer network. They should be able to identify the computer network topologies and its features. The student will be able to: Illustrate reference models with layers, protocols and interfaces. They should be able to identify and describe development history of routing protocols in real time environment. Students are also able to get the fundamental idea about some of the wireless networks like Cellular Networks, Adhoc Networks, Mobile Adhoc Networks, Sensor Networks, Virtual Private Networks. Delay Tolerant Networks they also gain the basic concept of Cisco IOS and its working.

List of Text Books:

- 1 Advance Computer Network, By Dayan and Ambawade, Dr. Deven Shah, Prof. Mahendra Mehra, Wiley India

List of Reference Books:

1. High-Speed Networks and Internets, Performance and Quality of Service, Second Edition, William Stallings, Pearson
2. TCP/IP Protocol Suite by Behrouz A. Forouzan
3. Computer Networks, Andrew Tanenbaum, 5th Edition, Pearson Education.
4. Computer Networks, Andrew S Tanenbaum, Edition 5, PHI, ISBN:-81-203-1165-5
4. Computer Networking Top Down approach 3rd edition By Jim Kurose and Keith Ross

List of Suggested titles of Experiments:

1. Introduction to SONET / SDH networks.
2. To study about IPV4 addresses.
3. Introduction and installation of Network Simulator (NS-2.30).
4. To study about simple TCL example in NS2.
5. To study about Bluetooth.
6. To study on Delay Tolerant Networks.
7. To study about different routing protocols.
8. To study and setup a small wireless network or sensor wireless network like Zigbee.
9. To study about Cisco IOS.
10. Configure a mail server for IMAP/POP protocols and write a simple SMTP client in C/C++/Java client to send and receive mails.

e-Resources:

1. <http://nptel.ac.in/>
2. www.isi.edu/nsnam/ns/
3. www.cisco.com
4. www.netacad.com