

Semester-V
Subject Name: Advance Computer Network
Subject Code: 09CE0508

Objective: To know the essential concept of network and data communication in computer network. This course provides basic knowledge of different aspect of networks as well awareness of current development in this area. This course especially useful to plan and implement network applications.

Credits Earned: 6 Credits

Course Outcomes: After completion of this course, student will be able to

- Describe the importance of computer networks and various protocols in layered architecture.
- Understand various topological and routing strategies for IP based networks.
- Compare various devices and protocols that builds computer network.
- Apply the concept of Scaling network and Wireless Network in the spanning tree protocol and wireless network.
- Develop program with Socket to demonstrate data communication as well Simulate static and dynamic routing protocols through simulation tools.

Pre-requisite of course: Basic knowledge of Computer Network

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
2	0	4	6	50	30	20	25	25	150



Unit	Topics	Contact Hours
1	Introduction of Computer Network Definition of computer network, application of computer network, Model (OSI and TCP/IP) with their layer functionality, comparison of OSI and TCP/IP model, summary of Network Devices, ATM	4
2	Network Layer Use of network layer, IP Protocol, IP V4, IP V6, difference of IP V4 and IP V6, IP addressing, masking, subnet and supernet masking, Integrated Service Architecture, Routing Algorithms, Resource Reservation Protocol, Multiprotocol Label Switching, Difference between unicast, broadcast and multicast, Internet Quality Services and architecture	6
3	Transport Layer Basics of Transport Protocol, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), difference between TCP and UDP, congestion control, Transport layer of TCP/IP	4
4	Application and Security DNS, E-Mail, HTTP, HTTPS, Firewall, File Transfer Protocol, Post Office Protocol (POP), Simple Mail Transfer Protocol (SMTP), Internet Message Access Protocol (IMAP), Asymmetric key cryptography, Symmetric key cryptography, Difference between symmetric and asymmetric key cryptography	6
5	Scaling Network Introduction, Spanning Tree: concept, protocol, configuration, First Hop Redundancy Protocol (FHRP), LAN switch type	4
6	Wireless Network Introduction, Wireless LAN, AdHoc Wireless Network, Energy Efficiency, Wireless Sensor Network, Introduction of CISCO.	4
	Total Hours	28

References:

1. Andrew S. Tanenbaum, "Computer Networks", Pearson Publications, 5th Edition.
2. Behrouz A. Forouzan, "Data Communication and networking", Tata McGraw Hill, fifth edition.
3. William Stallings, "Cryptography and Network Security", Pearson, Sixth Edition.
4. C. Siva Ram Murthi, B. S. Manoj, "Ad Hoc Wireless Networks: Architecture and Protocols", Prentice Hall
5. Wendell Odom, "CCNA Routing and Switching ICND2 200 -105 Official Cert Guide 1st Edition", CISCO Publication.

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
35%	35%	30%	0%	0%	0%

Suggested List of Experiments:

1. Study of Network devices in detail.
2. Study of Basic Network command and Network configuration command.
3. Implementation of Distance Vector routing protocol configuration and troubleshoot.
4. Implementation of Link State Vector routing protocol configuration and troubleshoot.
5. Implementation of Spanning Tree Protocol.
6. Install and test Network Operating System.
7. Install network file server and network print server.
8. Write a socket program with use of TCP.
9. Write a socket program with use of UDP.
10. Write a program to develop chat application.
11. Study of Wireless LAN configuration.
12. Implementation of VTP.
13. Implement Static and Dynamic routing by using CISCO packet tracer.
14. Study of NS-2 with basic commands.

Instructional Method:

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

1. https://www.tutorialspoint.com/data_communication_computer_network
2. <https://www.javatpoint.com/computer-network-tutorial>
3. <https://community.cisco.com/t5/technology-and-support/ct-p/technology-support>
4. <https://nptel.ac.in/courses/106105183>
5. <https://www.netacad.com/courses/networking/ccna-rs-introduction-networks>