



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

COURSECONTENT

ADVANCED COMPUTER NETWORKS LAB								
II Semester: CSE								
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
2425837	Foundation	L	T	P	C	CIA	SEE	Total
		0	0	4	2	40	60	100
Contact Classes: Nil	TutorialClasses: Nil	PracticalClasses: 60			TotalClasses:60			
Prerequisites: Data communication, Basic networking principles, Computer Networks								

CourseOverview:

This is a practical, hands-on laboratory course designed to reinforce and extend the theoretical concepts of advanced data structures through implementation and experimentation. The course focuses on understanding complex data structures, analyzing their performance, and applying them to solve real-world problems efficiently.

Course Objectives:

1. To understand and analyze the working principles of advanced computer network protocols and communication mechanisms.
2. To develop practical skills in implementing networking algorithms such as IP fragmentation, forwarding, and TCP protocols.
3. To gain hands-on experience in configuring network devices, establishing communication, and troubleshooting network connections.
4. To learn the usage of network monitoring and packet analysis tools such as Wireshark for analyzing network traffic.
5. To enhance the ability to simulate, monitor, and evaluate network performance and protocol behavior in real-world scenarios.

Course Outcomes: After Completion of the Course, Students should be able to

1. Implement and analyze core network layer mechanisms such as IP fragmentation, reassembly and forwarding.
2. Simulate and evaluate transport layer mechanisms such as TCP sliding window protocol for reliable data transfer.
3. Configure, connect, and troubleshoot systems using switches and private IP addressing, and verify connectivity using diagnostic tools.
4. Apply network packet capturing tools (e.g., Wireshark) to analyze TCP/IP protocol behavior, including headers, three-way handshake and session teardown
5. Evaluate application layer protocol interactions (HTTP, Telnet) by measuring response times, connection setup and packet exchange through packet-captures

List of Programs.

1. Implement the IP fragmentation and reassembly algorithm.
2. Implement the IP forwarding algorithm.
3. Implement the simplest sliding window protocol of TCP.
4. Connect two systems using a switch and configure private IP addresses to the systems and ping them from each other. Using Wireshark, capture packets and analyze all the header information in the packets captured.
5. Install Telnet on one of the systems connected by a switch and telnet to it from the other system. Using Wireshark, capture the packets and analyze the TCP 3-way Handshake for connection establishment and tear down.
6. Start packet capture in wireshark application and then open your web browser and type in an URL of the website of your choice. How long did it take from when the HTTP GET message was sent until the HTTP OK reply was received for the web page you visited in yourwebbrowser.

TEXTBOOKS:

1. Computer Networking: A Top-Down Approach, James F. Kurose and Keith W. Ross, 8th Edition, Pearson Education.
2. Computer Networks, Andrew S. Tanenbaum and David J. Wetherall, 5th Edition, Pearson Education.
3. Data and Computer Communications, William Stallings, 10th Edition, Pearson Education.
4. TCP/IP Illustrated, Volume 1: The Protocols, W. Richard Stevens, 2nd Edition, Addison-Wesley.

REFERENCEBOOKS:

1. Computer Networks: A Systems Approach, Larry Peterson and Bruce Davie, 5th Edition, Morgan Kaufmann Publishers.
2. Wireless Communications and Networking, Vijay K. Garg, 1st Edition, Morgan Kaufmann Publishers.
3. Interconnections: Bridges, Routers, Switches, and Internetworking Protocols, Radia Perlman, 2nd Edition, Addison-Wesley Professional.

ELECTRONICRESOURCES:

1. https://onlinecourses.nptel.ac.in/noc26_cs60/preview
2. <https://www.classcentral.com/course/swayam-advanced-computer-networks-119393>
3. <https://www.netacad.com/courses/networking>
4. <https://www.geeksforgeeks.org/computer-network-tutorials/>

MATERIALSONLINE:

1. Course template
2. Open-ended experiments
3. Definitions and terminology
4. Lab Manual

