



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

COURSE CONTENT

ADVANCED COMPUTER NETWORKS								
II Semester:CSE								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2225820	Foundation	L	T	P	C	CIA	SEE	Total
		3	0	0	3	40	60	100
Contact Classes:45	Tutorial Classes: Nil	Practical Classes: Nil			TotalClasses:45			
Prerequisites: Data Communication, Basic Networking Principles, Computer Networks								

Course Overview:

This course aims to provide advanced background on relevant computer networking topics to have a comprehensive and deep knowledge in computer networks. The course covers topics such as advanced routing and switching, network protocols, congestion control, Quality of Service (QoS), wireless and mobile networks.

Course Objectives:

1. To understand the advanced concepts, architectures, and protocols used in modern computer networks.
2. To study routing, congestion control, and transport layer protocols for efficient data communication across networks.
3. To learn wireless, mobile, and multimedia networking technologies and their real-world applications.
4. To analyze network applications, client-server communication, peer-to-peer systems, and internet protocols such as HTTP, FTP, DNS, and TCP/IP.
5. To develop the ability to design, simulate, and evaluate advanced networking solutions and communication systems.

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

1. Apply data-link protocols, wireless standards, and routing algorithms to design efficient communication networks.
2. Analyze transport layer protocols such as TCP, UDP, and congestion control mechanisms to ensure reliable data transmission.
3. Implement client-server applications using socket programming and evaluate network monitoring tools to study packet flow and routing techniques.
4. Examine wireless technologies like CDMA, Wi-Fi, and mobility management principles to address challenges in mobile communication.
5. Configure multimedia networking applications such as video streaming and VoIP using real-time communication protocols.

UNIT I:

Data-link protocols: Ethernet, Token Ring and Wireless (802.11). Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs), Multiple access schemes

Routing and Internetworking: Network-Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intra-domain Routing Protocols, Inter-domain Routing Protocols, Congestion Control at Network Layer.

UNIT - II:

Transport and Application Layer Protocols: Client-Server and Peer-To-Peer Application Communication, Protocols on the transport layer, reliable communication. Routing packets through a LAN and WAN. Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Mobile Transport Protocols, TCP Congestion Control. Principles of Network Applications,

UNIT-III:

The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS), P2P File Sharing, Socket Programming with TCP and UDP, building a Simple Web Server Creating simulated networks and passing packets through them using different routing techniques. Installing and using network monitoring tools

UNIT - IV:

Wireless and Mobile Networks: Introduction, Wireless links and Network Characteristics - CDMA, Wifi: 802.11 Wireless LANS, Cellular internet access, Mobility management: Principles

UNIT - V:

Multimedia networking: Multimedia networking applications, streaming stored video, Voice-over-IP, Protocols for real-time conversational applications

TEXTBOOKS:

1. Computer Networking: A Top-Down Approach, James F. Kurosu and Keith W. Ross, Pearson, 6th Edition, 2012.
2. Computer Networks and Internets, Douglas E. Comer, 6th Edition, Pearson

REFERENCE BOOKS:

1. A Practical Guide to Advanced Networking, Jeffrey S. Beasley and Piyasat Nilkaew, Pearson, 3rd Edition, 2012
2. Computer Networks, Andrew S. Tanenbaum, David J. Wetherall, Prentice Hall

ELECTRONIC RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc26_cs60/preview
2. <https://www.classcentral.com/course/swayam-advanced-computer-networks-119393>
3. https://onlinecourses.nptel.ac.in/noc25_cs15/preview
4. <https://elearn.nptel.ac.in/shop/nptel/computer-networks-and-internet-protocol/>

MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk and Concept Videotopics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper–I
8. Model question paper–II
9. Lecture notes
10. E-Learning Readiness Videos (ELRV)