



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

KAKINADA – 533 003, Andhra Pradesh, India

### DEPARTMENT OF INFORMATION TECHNOLOGY

III Year – I Semester		L	T	P	C
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<b>COMPUTER NETWORKS</b>					

#### Course Objectives:

The main objectives of this course are

- Study the basic taxonomy and terminology of the computer networking and enumerate the layers of OSI model and TCP/IP model
- Study data link layer concepts, design issues, and protocols

#### Course Outcomes:

At the end of the course, the students will be able to:

- Illustrate the OSI and TCP/IP reference model
- Analyze MAC layer protocols and LAN technologies

#### UNIT I

Introduction: Data Communication, components, data representation, data flow; Networks: network criteria, physical structures, network models, categories of network, inter connection of networks; The Internet: brief history, internet today, Standard organization, internet standards, Protocol Layering, TCP/IP Protocol Suite, The OSI model.

#### UNIT II

Physical layer: Data & Signals, Transmission Impairment, Data Rate Limits, Performance, Multiplexing, Spread Spectrum, Transmission Media: Guided Media, Unguided Media, introduction to switching: Circuit Switched Networks, Packet Switching.

#### UNIT III

Data Link Layer: Introduction, Link layer Addressing, Error Detection and Correction: Types of Errors, Redundancy, Detection vs Correction, Coding, block coding, cyclic codes: cyclic redundancy check, polynomials, cyclic code analysis, advantages, hard ware implementation, Checksum, Forward Error Correction, DLC Services, Data Link Layer Protocols

#### UNIT IV

Data Link layer: HDLC: configuration and transfer modes, framing, Point to Point protocol( PPP): services, framing, transition phase, multiplexing  
Random Access: ALOHA, CSMA, CSMA/CD, CSMA/CA, Controlled Access: Reservation, Polling, Token Passing, Channelization: FDMA, TDMA, CDMA.

#### UNIT V

Ethernet Protocol, Standard Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, IEEE-802.11: Architecture, MAC sub layer, addressing mechanism, Physical Layer  
Bluetooth: Architecture, bluetooth layers, WiMax, Cellur Telephony, Satellite Networks.  
Connecting Devices, Virtual LANS



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**Text Books:**

- 1) Data Communication and Networking , Behrouz A. Forouzan, McGraw Hill, 5th Edition, 2012
- 2) Computer Networks , Andrew S. Tanenbaum, David J. Wetherall, Pearson Education India; 5 edition, 2013

**Reference Books:**

- 1) Computer networks, Mayank Dave, CENGAGE.
- 2) Computer Networks: A Systems Approach, LL Peterson, BS Davie, Morgan-Kauffman , 5th Edition, 2011.
- 3) Computer Networking: A Top-Down Approach JF Kurose, KW Ross, Addison-Wesley , 5th Edition, 2009

**e-Resources:**

- 1) <https://nptel.ac.in/courses/106/105/106105183/>