COURSE STRUCTURE

Course Code	BCA20060
Course Category	**Program Major**
Course Title	**Computer Networks**

Teaching Scheme	Lectures	Tutorial	Laboratory / Practical	Project	Total	
Weekly load hours	3	-	-	-	3	
Credits	3	-	-	-	3	

Assessment Scheme Code	TT1

Pr-requisites:
1. Basic knowledge of computers

Course Objectives:
1. To understand the concept of computer networks
2. To be familiar with components required to build different types of networks.
3. To enumerate the layers of OSI model and TCP/IP model.

Course Outcomes:
Student will able to
1. Describe the organization and functioning of computer networks
2. Understand and describe functions of each layer of OSI and TCP/IP model.
3. Describe the data communication at physical layer
4. Describe the frame format, protocols used at data link layer
5. Describe the protocols used at medium access control sublayer
6. Understand and explain the IPV4 addresses, format of IP datagram used at network layer
7. Describe TCP and UDP protocols used at transport Layer
8. Explain the communication protocols used at Application Layer
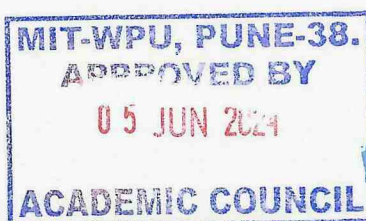
Course Contents:

Unit 1 : Introduction to Computer Networks: 6
Computer Networks -goals and applications, Data Communication : Data Flow, Networks : point-to-point connections, multipoint connections, Network topologies, Categories of Networks :LAN, WAN, MAN, protocols and standards

Unit 2 : Network Models: 6
OSI Reference Model, TCP/IP Reference Model, Comparison of OSI and TCP/IP model, Addressing : Physical, Logical and Port addresses

Unit 3 : The Physical Layer: 6
Signals, Transmission Modes : Parallel Transmission, Serial Transmission, Digital data transmission : Line coding schemes, Analog data transmission : Types of digital-to, analog conversion, Types of analog-to-analog modulation, Physical Layer Devices : Repeaters, Hubs- active hub Passive hub.

Unit 4 : The Data Link Layer: 5
Design Issues–Services provided to the Network Layer Framing–Concept, Methods–Character Count, Flag bytes with Byte Stuffing, Starting & ending Flags with Bit Stuffing and Physical Layer Coding Violations, Flow and Error Control Error detection, code CRC.

Unit 5: The Medium Access Sub layer: 5
Random Access Protocols ALOHA ,CSMA, CSMA/CD,CSMA/CA, Controlled Access Reservation, Polling and Token Passing Channelization FDMA, TDMA , CDMA

Unit 6: The Network Layer: 7
Store-and-forward packet switching Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of Connection, Oriented Service Comparison of Virtual Circuit and Datagram IPV4, IPV6 Addresses – Address Space, Notations, Classful Addressing, Subnetting, Supernetting,Classless Addressing, Datagram Format, Fragmentation, Checksum, Options.

Unit 7: The Transport Layer: 5
The Transport Services, Elements of Transport Protocols, Congestion Control, The Internet Transport Protocol - UDP, The Internet Transport Protocol – TCP, Performance Issues.

Unit 8: The Application Layer: 5
Domain Name System (DNS), Electronic Mail, The World Wide Web, Streaming Audio and Video, Content Delivery
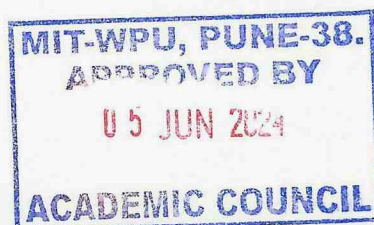
Learning Resources:

Text Books/Reference Books:

1. Computer Networks by Andrew Tanenbaum, Pearson Education. [4ᵗʰ Edition]

2. Computer Networking: A Top-Down Approach by James F. Kurose, Keith W. Ross [6th Edition]

3. Data Communication and Networking by Behrouz Forouzan, TATA McGraw Hill. [4ᵗʰ Edition]

Supplementary Reading:

1. Networking All In One Dummies Wiley Publication. [5th Edition]

2. Data Communications and Networks: An Engineering Approach, Irvine, Wiley Publication.

Web Resources :

Weblinks:

1. http://www.computernetworkingnotes.com

2. https://www.geeksforgeeks.org/last-minute-notes-computer-network/

3. https://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm

MOOCs: Online courses for self-learning

Courses by NPTEL and MIT Open Courseware etc

Pedagogy:

- Participative Learning,
- discussions,
- problem solving,
- assignments,
- Lab Assignment