NETWORKING
[CORE COURSE]

Semester: IV	Credits: 3	Subject Code: BC42101	Lectures: 48

Course Outcomes:

At the end of this course, the learner will be able to,
- Acquire knowledge about Computer Networks concepts.
- Recognize working of networking models, addresses, transmission medias and connectivity devices.
- Acquire information about network security and cryptography.

Unit 1: Introduction to Computer Network	10

- Basics of Computer Network
- Definition
- Goals, Applications, Network Hardware –Broadcast, Point to Point
- Components of Data Communication
- Network Topologies
- Types of Networks
- LAN, MAN, WAN
- Internetwork, Wireless Network
- Modes of Communication
- Simplex, Half Duplex, Full Duplex
- Server Based LANs & Peer-to-Peer LANs
- Protocols and Standards
- Network Software
- Protocol Hierarchies, Layers, Peers, Interfaces
- Design Issues of the Layers
- Connection Oriented and Connectionless Service

Unit 2: Network Models	08

- OSI Reference Model: Functions of each Layer
- TCP/IP Reference Model,
- Comparison of OSI and TCP/IP
- TCP/IP Protocol Suite
- Addressing
- Connection oriented and connectionless services
- Physical Addresses, Logical Addresses, Port Addresses, specific Addresses ,IP Addressing
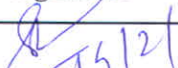- Classful Addressing
- Classless Addressing

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Unit 3: Transmission Media and LAN	8

- Introduction, Types of Transmission Media
  - Guided Media: Twisted Pair Cable- Physical Structure, Categories, Connectors &Applications
  - Coaxial Cable – Physical Structure, Standards, Connectors & Applications Fiber Optic Cable- Physical Structure, Propagation Modes, Connectors & Applications
  - Unguided Media
  - Electromagnetic Spectrum for Wireless Communication
  - Propagation Modes Ground, Sky, Line-of-Sight
  - Wireless Transmission: Radio Waves, Microwaves, Infrared
- Wired and Wireless LAN
  - IEEE Standards
  - Standard Ethernet MAC Sublayer, Physical Layer
  - Fast Ethernet – Goals, MAC Sublayer, Topology
  - Gigabit Ethernet – Goals, MAC Sublayer, Topology,
  - Virtual LANs Membership, IEEE standards advantages
  - Wireless LAN
  - IEEE 802.11 Architecture
  - Bluetooth Architecture (Piconet, Scatternet)

Unit 4: Network Devices and Security	14

- Network Connectivity Devices
  - Active and Passive Hubs
  - Repeaters
  - Bridges- Types of Bridges
  - Switches
  - Router
  - Gateways
- Need for Security
- Security Services: Message- -Confidentiality, Integrity, Authentication, Non repudiation.
- Entity (User)- Authentication.
- Types of Attack
- Cryptography, PlainText,Cipher Text, Encryption,Decryption, Symmetric Key and Asymmetric Key
  Cryptography
  SubstitutionTechniques, Caesar Cipher,and Transposition Cipher (Problems should be covered.)
- Firewalls- Packet Filter firewall, Proxy firewall Steganography,opyright

#12 hours for Library work, assignments practical or field work

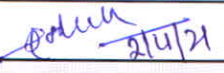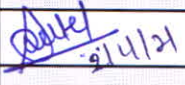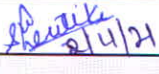| Board Of Studies	Name	Signature
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Recommended Text Books:
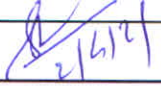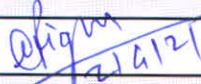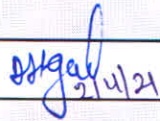
- Atul kahate ,*Cryptography and Network Security*,Mc Graw Hill Education,2013
- Douglas E. Comer *Computer Networks*, Person Eduction, 2008, (Fourth Edition)
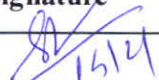- Behrouz A Forouzan ,*Cryptography and Network Security* ,Mc Graw Hill Eduction,2015

Reference Books:

- Andrew S.Tanenbaum , *Computer Networks:*,Person,2003(fourth Edition) .

Websites:

- https://www.tutorialspoint.com/
- www.w3schools.com

Board Of Studies	Name	Signature	
Head of the Department	Prof. Smita Borkar		2/4/21
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Subject Expert (Outside SPPU)	Prof Sachin Bohite		2/4/21
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