



| Sr. No | Subject Code | Subject Name | Teaching Hours/Week | | | | Credits | Evaluation Scheme/Semester | | | | | | | |
|--------|--------------|------------------------------|---------------------|----|----|-------|---------|----------------------------|-----|-----------------|-----|-----------|----|------|-------------|
| | | | Th | Tu | Pr | Total | | Theory | | | | Practical | | | Total Marks |
| | | | | | | | | Sessional Exam | | University Exam | | Internal | | Uni. | |
| | | | | | | | | Marks | Hrs | Marks | Hrs | Pr | TW | Pr | |
| 3 | 4CS04INE1 | Networkin g Essentials | 4 | - | - | 4 | 4 | 30 | 1.5 | 70 | 3 | - | - | - | 100 |

Objectives:

The student would be able

- 1) To become familiar with the fundamentals of data communication and networking.
- 2) To understand different network technologies.
- 3) To get insights into different advanced network technologies that can be used to connect different networks.

Pre-requisites: Student should have knowledge about computer

Course Outline:

| Chapter No | Chapter Name | Topics Covered | No of Lectures |
|------------|---|---|----------------|
| 1 | Introduction to Data communications and Networking | Introduction Fundamental concepts Data communications Protocols Standards Signal propagation Analog and digital signals Bandwidth of a signal and a medium Analog and Digital transmission Introduction Analog signal, Analog transmission Digital signal, Digital transmission Digital signal, Analog transmission Baud rate and bits per second Analog signal, Digital transmission (excluding: Adaptive and Delta modulation) Modes of data transmission Introduction | 13 |

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|---|---|---|----|
| | | <p>Parallel and Serial communication</p> <p>Asynchronous, Synchronous communication</p> <p>Simplex, half duplex and full-duplex communication</p> | |
| 2 | Multiplexing and Demultiplexing | <p>Multiplexing and Demultiplexing</p> <p>Types of multiplexing</p> <p>FDM versus TDM</p> <p>WDM</p> <p>Transmission errors: Detection and correction</p> <p>Introduction</p> <p>Error classification</p> <p>Types of Error</p> <p>Error Detection (Checksum, VRC, LRC, CRC)</p> <p>Recovery from errors</p> | 10 |
| 3 | Transmission Media | <p>Introduction</p> <p>Guided media</p> <ul style="list-style-type: none"> ○ Twisted pair ○ Coaxial cable ○ Optical fiber <p>Unguided media</p> <ul style="list-style-type: none"> ○ Microwave ○ Satellite communication ○ Cellular telephones | 10 |
| | Network topologies and Switching | <p>Introduction</p> <p>Topologies</p> <ul style="list-style-type: none"> ○ Mesh ○ Star ○ Tree ○ Ring ○ Bus ○ Hybrid <p>Basics of switching</p> <p>Types of switching</p> <ul style="list-style-type: none"> ○ Circuit ○ Packet ○ Message | 10 |
| 4 | Network protocols, OSI, TCP/IP model | <p>Network protocols, OSI, TCP/IP model 10 hours</p> <p>Introduction</p> <p>Protocols in computer communications</p> <p>OSI model and layer functions</p> <p>TCP/IP</p> | 12 |

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|--|--|---|-----------|
| | | <ul style="list-style-type: none"> ○ Introduction ○ TCP/IP basics LAN and WAN Introduction LAN Ethernet ○ Introduction ○ Properties of Ethernet ○ CSMA/CD Introduction to VLAN, Fast and Gigabit Ethernet Token ring ○ Basics of Token ring FDDI ○ Introduction ○ Properties ○ Operation ○ Self healing mechanism Introduction to WAN ISDN, Architecture, Channel types, interfaces Bluetooth Infrared communication Wireless LAN Internetworking devices ○ Repeaters ○ Bridges ○ Routers ○ Gateway | |
| | | Total | 55 |

Textbook:

Data Communications and Networks, 2nd Edition

Publisher: McGraw Hill By Achyut S Godbole, Atul Kahate

Reference Books:

1. Business data communication Publisher: Cengage publications, By Selly Cashman
2. Data communications and networking, Publisher: McGraw Hill By Behrouz Forouzan
3. Computer networks Publisher: Pearson By Andrew S. Tanenbaum