

# Certificate Course in Computer Networking

Course Duration: 60 hours

## Scheme of Course

Paper No.	Title of Paper	Maximum Marks	Passing Marks	Duration of Exam
	Computer Networking(Theory)	50	20	3 hours
	Lab based on Computer Networking	50	20	3 hours

### Program Outcome:

#### At the end of the program , student will be able to :

- Analyze, design, diagnose and document computer network specifications to meet client needs.
- Install and troubleshoot system hardware.
- Install, configure and troubleshoot client operating system.
- Disassemble, troubleshoot/debug, upgrade, replace basic components, and reassemble servers and client systems.
- Use proper computer system and networking terminology.
- Perform help desk functions to answer user questions and provide user training on application software and fundamental operating systems functions.

### Job Roles in Government Sector, IT Firm & Private Organizations:

- Network Engineer/ Junior Engineer
- Network Administrator
- Network System Manager
- Network Consultant
- Web Administrator
- Computer Network Technician
- System Engineer

### Objectives:

1. Build an understanding of the fundamental concepts of computer networking.
2. Resource sharing
3. Increase system performance as the work load increases (load balancing).
4. To understand issues relating to networking.
5. To study & employ network defense measures.
6. User Authorization to access resource in a computer network
7. Describe the general principles of data communication.
8. Describe how computer networks are organized with the concept of layered approach.
9. Describe how signals are used to transfer data between nodes.
10. Implement a simple LAN with hubs, bridges and switches.
11. Describe how packets in the Internet are delivered.

**Paper Code:**  
**Nomenclature: Computer Networking (Theory)**

**Maximum Marks: 50**

**Minimum Marks: 20**

**Time: 3 hours**

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

**Unit I**

Introduction to Data Communication and Computer Networks; Uses of Computer Networks; Types of Computer Networks and their Topologies; Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways;

Uses of computer networks ; Networks for companies, Networks for people, Social Issues: Classification of networks; Based on transmission technology, Based on the their scale,

Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; OSI Reference Model; TCP/IP Model; Comparison of the OSI & the TCP/IP Reference Models;

Networking Models: Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web-Based Model and Emerging File-Sharing Model;

**UNIT – II**

Analog and Digital Communications, data and signals Concepts: Analog and Digital data and signals; Bandwidth and Data Rate, Capacity, Baud Rate; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Modems and modulation techniques; ADSL and Cable Modems;

Data transmission modes: Serial & Parallel, Simplex, Half duplex & full duplex; Synchronous & Asynchronous transmission;

Network topologies: Linear Bus Topology, Ring Topology, Star Topology, Hierarchical or Tree Topology, Topology Comparison, Considerations when choosing a Topology;

**UNIT - III**

Data Link Layer Design issues; Error Detection and Correction; Sliding Window Protocols: One-bit, Go Back N and Selective Repeat; Media Access Control: ALOHA, Slotted ALOHA, CSMA, Collision free protocols; Introduction to LAN technologies: Ethernet, Switched Ethernet, Fast Ethernet, Gigabit Ethernet; Token Ring; Introduction to Wireless LANs and Bluetooth; VLANs

**UNIT – IV**

Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control; Traffic shaping; Choke packets; Load shedding; Elements of Transport Protocols; Application Layer: Introduction to DNS, E-Mail and WWW services;

Network Security Issues: Security attacks; Encryption methods; Digital Signature; Digital Certificate;

#### TEXT BOOKS:

- Andrew S. Tanenbaum, “Computer Networks”, Pearson Education.
- Michael A. Gallo, William M. Hancock, “Computer Communications and Networking Technologies”, CENGAGE Learning.

#### REFERENCE BOOKS:

- Behrouz A Forouzan, “Data Communications and Networking”, McGraw Hill.
- Bhushan Trivedi, “Computer Networks”, Oxford
- BCA-355: Programming Using Visual Basic

**Paper Code:**  
**Nomenclature: Lab based on Computer Networking (Practical)**

**M.M: 50**  
**Time: 3 hours**

**Distribution of Marks**  
Experiment: 25  
Practical Work Book: 15  
Viva Voce: 10

**Course Outcome:**

After learning the course the students will be able to:

- Demonstrate a basic understanding of components of computer networks.
- Present conclusions effectively, orally and in writing.
- Identify the different types of network devices and their functions within a network
- Install LAN and WAN Connections.
- Installation and configure of Server and Clients.
- Administer and maintain a Computer Network.

**List of Experiments**

<b>S.No</b>	<b>Experiment</b>
<b>1</b>	Overview of Networks and layered communications, understanding of Network equipment, wiring in details 5 2 CAT6 UTP EIA/TIA 568A/B straight and cross-over wiring
<b>2</b>	Study of different types of Network cables and Practically implement the cross-wired cable and straight through cable using clamping tool.
<b>3</b>	Study of Network Devices in Detail.
<b>4</b>	Study of network IP.
<b>5</b>	Exploring Different LAN Switch Options
<b>6</b>	Creating of a LAN and Connect the computers in Local Area Network.
<b>7</b>	Installation of LAN cards(Wired / Wi-Fi)
<b>8</b>	Installation of CAT5 cable and RJ 45 connectors
<b>9</b>	Study of basic Network command and Network configuration commands.
<b>10</b>	Installation and connection of switches

<b>11</b>	Installation of Server(Windows and Linux)
<b>12</b>	Installation of Client
<b>13</b>	Creation of users and policies
<b>14</b>	Assigning permissions
<b>15</b>	Sharing of resources (Printer, Drives, Scanner)
<b>16</b>	Configuring and Troubleshooting a switched network
<b>17</b>	Introduction to Packet Tracer
<b>18</b>	Configure a Network topology using packet tracer software.
<b>19</b>	Firewall Implementation, Router Access Control List (ACL)
<b>20</b>	Planning Network-based Firewalls

## **Hardware and Software Requirement**

### **Hardware Requirement**

RJ-45 connector, Clipping Tool, Twisted pair Cable

### **Software Requirement**

Command Prompt And Packet Tracer.

# Advertising & Marketing

## Value Added Course

### Course Contents:

#### Unit I: Introduction to Marketing

6 sessions

- Meaning, definition and scope of Marketing.
- Evolution of marketing and its role in the changing business environment.
- Various marketing management philosophies: the production concept, the product concept, selling concept and the marketing concept.

#### Unit II: Analyzing Marketing Opportunities

6 sessions

- Internal and External Marketing Environment Analysis
- Introduction to Marketing Information System
- Marketing Research- role and its significance

#### Unit III: Consumer Behaviour

7 sessions

- Buying Behaviour for Consumer Markets
- Comparison of Consumer Markets and Industrial Markets
- Buying Decision Process

#### Unit IV: Marketing Mix

8 sessions

- Segmenting, Targeting, Positioning
- Marketing mix
- Product Life Cycle
- Introduction to Brand Management

#### UNIT V: Advertising

8 sessions

- Advertising and marketing: Need, similarities and difference
- Advertising: Meaning, scope, objectives, functions and types □ Advertising Budget: Meaning, process and methods
- Creative aspects of advertising: message, advertising appeals
- Types of advertising media

#### Pedagogy:

Following pedagogical approaches are adopted:

- Lecture Method: This is for understanding of the concepts and various theories and trends and involves extensive use of audio visual stimuli and news articles.
- Group Presentations/ Case Studies: To develop teamwork abilities and problem solving skills by applying the conceptual framework to business problems.

#### Examination Scheme:

The details of the evaluation components are given below

	Internal Evaluation	External Evaluation
Components	Assessment & Presentation Skills	Written Exam
Weightage (%)	40	60