**Bachelor of Technology (Computer Science and Engineering)**

**Semester-V**

L-2 T-1 P-0 C-3

**CSE190TR1 : Computer Network**

**Course Objectives**

* To describe the simple file transfer between two systems by opening socket connection to out server on one system and sending a file from one system to another.
* To get familiarized with the basic protocols of computer networks.
* To describe the technical issues related to the local Area Networks

**Course Outcomes (COs)**

1. Understand the different components in a Communication System and their respective roles.
2. Understand the fundamental concepts on data communication and the design of computer networks.
3. Analyze network devices and layer protocols to synthesize effective network designs
4. Understand TCP/UDP protocols, process-to-process delivery, congestion management, and Quality of Service principles.
5. Analyze the hierarchical structure and distribution of the domain name space within the Application Layer

**Articulation Matrix**

*(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)*

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO/PO/PSO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | **3** | **2** | **1** | **-** | **-** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **2** |
| **CO2** | **3** | **2** | **1** | **-** | **-** | **-** | **1** | **-** | **1** | **-** | **-** | **2** | **-** | **2** | **1** |
| **CO3** | **2** | **3** | **2** | **1** | **-** | **-** | **1** | **-** | **-** | **2** | **-** | **1** | **-** | **2** | **1** |
| **CO4** | **1** | **3** | **2** | **1** | **1** | **1** | **2** | **-** | **-** | **-** | **-** | **2** | **2** | **1** | **2** |
| **CO5** | **3** | **2** | **1** | **1** | **-** | **1** | **1** | **-** | **-** | **-** | **-** | **1** | **2** | **2** | **1** |

### High-3 Medium-2 Low-1

### UNIT I: Introduction to Network 9 Hours

### Definition, Applications, line configuration, Network topologies, Transmission mode, Types of Networks (LAN, WAN, MAN), Protocols,Network models: The OSI model, TCP/IP Protocol Suite. Physical Layer: Signals –Analog signals, Digital signals, Transmission media - Guided & Un- Guided.

### UNIT II: Network LAN Technologies 9 Hours

### Network LAN Technologies: Ethernet, Fast Ethernet, Gigabit Ethernet, and Wireless LAN’s Data Link Layer: Error Detection and correction - Types of Errors, Error Detection, Error correction. Data link Protocols – Stop-and-wait ARQ, Go-back-n ARQ, Automatic Repeat Request (ARQ).

### UNIT III: Network Devices: 9 Hours Network Devices: Modem, Hub, Switch, Router, Repeaters, bridges, Gateway Network Layer: Internetwork Protocol (IP), Addressing (Classes, Dotted-decimal notation, Sample Internet), Subnet mask, Network layer Protocols – ARP, IPv4, and IPv6.

### UNIT IV: Transport Layer 9 Hours

Transport Layer: TCP protocol, UDP protocol, Process-to-Process delivery, Congestion: Congestion control, congestion avoidance, congestion discarding, Quality of Service (QOS).

### UNIT V: Application Layer 9 Hours

Application Layer: Domain Name System (DNS) - domain name space, distribution of name space, DNS in the Internet, SMTP, SNMP, FTP, POP3, HTTP, WWW.

 **Total: 45 Hours**

**Reference(s):**

* 1. Computer Networking- A Top-Down approach (6th edition), Kurose and Ross, Pearson
	2. Computer Networks- A Top-Down approach, Behrouz Forouzan, McGraw Hill
	3. Computer Networks (5th edition), Andrew Tanenbaum, Prentice Hall
	4. Computer Networking and the Internet (5th edition),Fred Halsall, Addison Wesley
	5. Data Communications and Networking (5th edition), Behrouz Forouzan, McGraw Hill
	6. TCP/IP Protocol Suite (4th edition), Behrouz Forouzan, McGraw Hill

**List of e-Learning Resources:**

1. https://nptel.ac.in/
2. <https://www.coursera.org/>
3. <https://www.netacad.com/courses/packet-tracer>

**Subject Tr. Academic Coordinator HoD Sr. Faculty Nominated by DOAA**