**TCP/IP**

| **Course Code** | | **Year** | III | **Semester** | II |
|---|---|---|---|---|---|
| **Course Category** | Honors | **Branch** | CSE | **Course Type** | Theory |
| **Credits** | 4 | **L-T-P** | 4-0-0 | **Prerequisites** | Computer Networks |
| **Continuous Evaluation :** | 30 | **Semester End Evaluation:** | 70 | **Total Marks:** | 100 |

| **Course Outcomes** | | |
|---|---|---|
| Upon successful completion of the course, the student will be able to | | |
| **CO1** | Understand the fundamental concepts of TCP/IP architecture and protocols, with emphasis on the network layer and transport layer of the suite. | **L2** |
| **CO2** | Apply the concepts of flow control, error control and congestion control in the protocols of network layer and transport layer of the suite | **L3** |
| **CO3** | Analyze the network architecture and assign suitable network addresses. | **L4** |
| **CO4** | Analyze various services and features of Transport Layer Protocols. | **L4** |

**Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations**

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | √ | | | | | | | | | | | | | |
| **CO2** | √ | | | | | | | | | | | | √ | |
| **CO3** | √ | | | | | | | | | | | | √ | |
| **CO4** | | √ | | | | | | | √ | √ | | | √ | √ |

| Syllabus | | Mapped CO |
|---|---|---|
| **Unit No.** | **Contents** | |
| **I** | TCP/IP Protocol suite and Addressing, Delivery and forwarding of IP packets.<br>IPV4 Addresses- Introduction, Classful and Classless Addressing, Special address, Network Address Translation (NAT).<br>Internet Protocol Version4(IPv4) – Datagrams, Fragmentation, Options, Checksum, Security, IP Package. | **CO1, CO3** |
| **II** | IPv6 Addressing – Introduction, Address Space Allocation, Global Unicast Addresses, Auto configuration and Renumbering.<br>IPv6 Protocol - Introduction, Packet Format, Transition from IPv4 to IPv6. *ICMPv6* - Introduction, Error Messages, Informational Messages, Neighbor Discovery Messages, Group Membership Messages. | **CO1, CO2, CO3** |
| **III** | Introduction to the Transport Layer – Transport Layer Services, Features, Segment, TCP Connection, Windows in TCP. | **CO1, CO2, CO4** |
| **IV** | Transmission Control Protocol – II: Flow Control, Error Control, Congestion Control, TCP Timers, Options and TCP Package. | **CO1, CO2, CO4** |
| **V** | Stream Control Transmission Protocol: Services, Features, Packet format, Association, STD, flow control, error control, congestion control,<br>Internet Security: Network Layer security, Transport Layer Security | **CO1, CO2, CO4** |

| **Learning Resources** |
|---|
| **Text Books** |
| 1. TCP/IP Protocol Suite , Behrouz A. Forouzan, 4th Edition, Tata McGraw-Hill Edition, 2017. |
| **References** |
| 1. Internetworking with TCP/IP: Principles, Protocols and Architecture, 6th Edition, Douglas E Comer. Pearson, 2013.<br>2. TCP/IP Illustrated, Volume 1: The Protocols (computing Series), Kevin Fall and W. Stevens, Second Edition, Addison-Wesley,2011<br>3. TCP/IP Illustrated: The Implementation, Vol. 2, W. Richard Stevens and Gary R. Wright, First Edition, 2011 |
| **e-Resources & other digital material** |
| 1. https://www.geeksforgeeks.org/engineering-mathematics-tutorials/<br>2. https://www.tutorialspoint.com/discrete_mathematics/index.htm<br>3. http://www.alas.matf.bg.ac.rs/~mi10164/Materijali/DS.pdf<br>4. https://nptel.ac.in/courses/111107058/ |