

Name of the Programme: MCA

Course Code: CSA-503

Title of the Course: Internet Technologies

Number of Credits: 3 (3L-0T-0P)

Effective from AY: 2022-23

<u>Prerequisites for the course</u>	Programme requisites	
<u>Objectives:</u>	The objective of the course is to introduce the TCP/IP architecture and allied protocols of the Internet by following a top-down approach.	
<u>Content:</u>	Computer Networks and the Internet: Networking and Inter-networks, Internetworking devices, Internet: Network edge, and the Network core. TCP/IP protocol stack: Protocol stack, Connection-oriented, connectionless services, Packet switching, circuit switching, Delay, Loss, and Throughput in Packet-Switched Networks.	6 hours
	Application layer: Principles of Application Layer Protocols, the Web and HTTP, MIME, mail access protocols, DNS, Peer to Peer Applications, Video Streaming, and Content Distribution Networks.	8 hours
	Transport layer: Transport-layer services, Multiplexing and demultiplexing, UDP protocol, Principles of reliable data transfer, Connection-oriented transport - TCP protocol, Principles of congestion control, TCP congestion control.	8 hours
	Network layer: Packet switching: virtual circuit & datagram networks, Forwarding and Routing (Network Data and control planes). The Internet Protocol (IP): IPv4 Datagram format, fragmentation, IPv4 Addressing in the Internet, route aggregation, subnetting, CIDR, Network Address Translation, DHCP, ICMP. Control Plane: Routing protocols- shortest path, link state routing algorithm, distance vector routing. Autonomous Systems (AS), Intra-AS Routing in the Internet: OSPF, Internet routing: RIP, OSPF, BGP, Address Resolution Protocol (ARP), and RARP.	12 hours
	Wireless and Mobile Networks: WiFi (802.11 Wireless LAN), Bluetooth, and Cellular Internet Access.	5 Hours
	Security in Computer Networks: Basic cryptography concepts, Secure Socket Layer (SSL), Internet Security Protocol (IPSec), Virtual Private Network (VPN).	6 hours
<u>Pedagogy:</u>	lectures/ tutorials/assignments/self-study/ flipped classroom	
<u>References/ Readings</u>	1. Forouzan, Behrouz A., and Firooz Mosharraf. "Computer networks: a top-down approach". McGraw-Hill, 2012. 2. Andrew S. Tanenbaum., "Computer Networks", (5th Edition) Prentice Hall of India. 3. James F. Kurose, Keith W. Ross, "Computer Networking: A Top-Down Approach" Pearson, Sixth Edition 2017.	
<u>Course Outcomes</u>	After completion of this course, students will be able to • Have a good understanding of layered communication architecture (TCP/IP) and knowledge of some of the important networking protocols • Understand the concepts of reliable data transfer and how TCP implements these concepts. • Basic knowledge of routing algorithms. • Basic knowledge of security in computer networks.	