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| **https://lh3.googleusercontent.com/LDBH0Mxv8ERA4XaYff0ayw6_p0mBadusK0ZMLMSfUX2m9KEGtSM-_-Vmgy8saNzVueBfh6to61pZdqwk9oqURhxQPGpKiIhw4fRuREBx4s0e9RjOECPDKnHsLTQVdtO6C4Qs1-mQ** | **https://lh5.googleusercontent.com/3hL_T1tL5_VZVSAX6r6mzmjYvt6EWdL86xv8tnOS2JJJISh55VeQ41Hr6PxVAC6lufzS-vJfClBx13eAimLiJ_eerZYhCweSXmDn5XTmV2j5vOgBlccjE6HHOig7Sjd60Mgi0DzPSAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES**  **SAVEETHA SCHOOL OF ENGINEERING**  **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING** | | | | | |
| **CSA0701** | | **COMPUTER NETWORKS AND CYBER SECURITY** | **3** | **0** | **2** | **4** |
| **Prerequisite** | | NIL | | | | |
| **Course Objectives** | | The course on Computer Networks aims to provide the students with the following:  1. Knowledge on different network topology, mode of network communication and various types of network devices deployed between source and destination systems  2. Understand how seamless communication happens in a MPLS and ATM networks.  3. Create systems under various subnets and route packets between them using appropriate protocols.  4. Efficient management of congestion in a network based on various transport layer protocols, using different service mechanisms and QoS Parameters.  5. Understand and configure application layer protocols such as RTP, RTCP, RSVP, DHCP and DNS for ease of operation of networks. | | | | |
| **Course**  **Outcomes** | | On successful completion of the course, the student will be able to:  OU1. Demonstrate the different types of network topology using network devices with appropriate cables.  OU2. Analyze the operating mechanisms of various high speed network protocols.  OU3. Demonstrate different routing protocols in heterogeneous networks.  OU4.Develop and deploy socket based applications using TCP, UDP and improve QoS with Congestion control algorithms.  OU5.Configure and implement various application layer protocols.  ***Note: Numbers given in the parenthesis refer to Graduate Attributes required by (NBA).*** | | | | |
| **UNIT I** | | **PHYSICAL LAYER AND MEDIA** | |  | | |
| Introduction to Networks and Communication Media: Uses- Network Hardware- Network Software- Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI mode - Reference Models. Basis for data communication- Transmission Media- Wireless Transmission- Telephone Systems- Satellite Communication, Ethernet Interface and Configuration | | | | | | |
| **UNIT II** | | **DATA LINK LAYER** | |  | | |
| Error Detection and Correction, Data Link Control, Multiple Access, Wired/Wireless LAN, Connecting LANs, Backbone Networks, Wireless LANs – 802.11 – Bluetooth and Virtual LANs, Wireless WANs: Cellular Telephone and Satellite Networks SONETISDH, Virtual-Circuit Networks, Frame Relay ATM and MPLS. MPLS VPN, Virtual Routing Forwarding, MPLS Traffic Engineering, IPv6 over MPLS, MPLS and QoS. | | | | | | |
| **UNIT III** | | **NETWORK LAYER** | |  | | |
| Internetworks – Packet Switching and Datagram approach – IPv4 addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Multicast, DVMRP, IGMP, PIM-DM, PIM-SM, Bi-directional PIM, BGP, IPv6 addresses, Internetworking | | | | | | |
| **UNIT IV** | | **TRANSPORT LAYER** | |  | | |
| Duties of transport layer – Multiplexing – Demultiplexing – TCP Sockets – User Datagram Protocol (UDP), Multicast– Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services, Differentiated Service, Performance Modeling and Estimation- Probability and Stochastic Process, Queuing Analysis- models, single server, multi-server, Priority Queues, Network of Queues, Congestion and Traffic Management, Link-Level Flow and Error Control, Traffic and Congestion Control in ATM Networks, Internet Routing, QoS in IP Networks. CDNs, Caching | | | | | | |
| **UNIT V** | | **APPLICATION LAYER** | |  | | |
| Domain Name Space (DNS) – SMTP – FTP – HTTP - Electronic Mail, MIME, POP - SNMP – P2P Communication, JXTA, RTP, RSVP, SIP, VOIP, Video Streaming using Java Media Frame work. Overlay Network. Resilient Overlay Network. SSL Security - firewalls, DoS, etc. | | | | | | |
| **TEXT BOOKS** | | | | | | |
| 1. Behrouz A. Forouzan, Fourth Edition ―Data communication and Networking‖, Tata McGraw-Hill, 2012.  2. ANDREW S. TANENBAUM DAVID J. WETHERALL – Fifth Edition - Computer Networks Pearson -2011 | | | | | | |
| **REFERENCES** | | | | | | |
| 1. Andrew Singmin - Beginning Digital Electronics Through Projects – Newnes - 2001. 2. Anil.K.Maini, “Digital Electronics : Principles, Devices and Applications” Wiley Publishers 3. B.Somanathan Nair - Digital Electronics and Logic Design - Easters Economy Edition. 4. Prakash C. Gupta - Data Communications and Computer Networks – PHI Learning Fourth Edition -2006 5. Larry L.Peterson and Bruce S. Davie - Computer Networks –Elsevier Fourth Edition -2008 6. James F.Kurose and Keith W. Ross - Computer Networks –Pearson Education - 2005 | | | | | | |