PARUL UNIVERSITY - Faculty of Engineering and Technology

Department of Computer Science & Engineering
SYLLABUS FOR 4th Sem BTech PROGRAMME
Computer Networks (203105255)

Type of Course: BTech

Prerequisite: knowledge of Computer and Information system

Rationale: This course is design to provide the basic knowledge about the data & signals. It also provides basic concepts of computer network and firm foundation for understanding how data communication occurs in the Transmission Medium. It will help to develop logical abilities and practically setup the network

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
				External		Internal			
Lect Hrs/	Tut Hrs/	Lab Hrs/		T	P	T	CE	P	
3	0	0	3	60	-	20	20	-	100

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Unit 1: DATA COMMUNICATION COMPONENTS**: Representation of data and its flow Networks, VariousConnection Topology, Protocols and Standards, OSI model, Transmission Media, LAN:Wired LAN, Wireless LANs, Connecting LAN and Virtual LAN, Techniques forBandwidth utilization: Multiplexing - Frequency division, Time division and Wavedivision, Concepts on spread spectrum.	25%	11
2	**Unit 2: DATA LINK LAYER AND MEDIUM ACCESS SUB LAYER**: Error Detection and Error Correction -Fundamentals, Block coding, Hamming Distance, CRC; Flow Control and Error controlprotocols - Stop and Wait, Goback – N ARQ, Selective Repeat ARQ, Sliding Window,Piggybacking, Random Access, Multiple access protocols - Pure ALOHA, Slotted ALOHA,CSMA/CD,CDMA/CA	25%	11
3	**Unit 3: Network Layer**: Switching, Logical addressing – IPV4, IPV6; Address mapping –ARP, RARP, BOOTP and DHCP–Delivery, Forwarding and Unicast Routing protocols	20%	8
4	**Unit 4: Transport Layer**: Process to Process Communication, User Datagram Protocol(UDP), Transmission Control Protocol (TCP), SCTP Congestion Control; Quality ofService, QoS improving techniques: Leaky Bucket and Token Bucket algorithm.	15%	6

5	**Unit 5: Application Layer**: Domain Name Space (DNS), DDNS, TELNET, EMAIL, File TransferProtocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls, Basic concepts ofCryptography	15%	6

*Continuous Evaluation:

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Computer Networks
   Andrew S. Tanenbaum and David J. Wetherall; PEARSON Edition
2. Internetworking with TCP/IP Principles, Protocols and Architecture
   Douglas E Comer
3. TCP/IP Illustrated
   Richard Stevens
4. Data Communication and Networking
   Behrouz A. Forouzan; fourth edition; Tata Mc Graw Hill
5. Data and Computer Communication
   W. Stallings; McMillan

Course Outcome:

After Learning the course the students shall be able to:

1. Explain the functions of the different layer of the OSI Protocol.

2. Draw the functional block diagram of wide-area networks (WANs), local areanetworks (LANs) and Wireless LANs (WLANs) describe the function of each block.

3. For a given requirement (small scale) of wide-area networks (WANs), local areanetworks (LANs) and Wireless LANs (WLANs) design it based on the marketavailable component.

4. For a given problem related TCP/IP protocol developed the network programming.

5. Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW,HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.