C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Technology and Engineering
DEPARTMENT OF: - Information Technology
SEMESTER: - VII
CODE: - **4TE07NGN1**
NAME: – Next Generation Networks

Teaching & Evaluation Scheme: -

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
							Theory				Practical (Marks)			Total
		Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	
							Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
4TE07NGN1	Next Generation Networks	3	0	2	5	4	30	1.5	70	3.0	-	20	30	150

Objectives:

The learning objectives of this course are to:
- Understand uses of TCP/IP protocol suite.
- Understand, design and implement Advanced Applications
- Utilize the concepts of TCP/IP protocol to develop client-server applications.

Prerequisites:
- Basic knowledge about Data Communication & Networking concepts such as Network Topology, network categories and network connecting devices.

Course outline:

Sr. No.	Course Contents	Total Hrs.
1	**Layering Model and Physical Interface:** Introduction, Protocols and Standards, Standards Organization, Internet Standards, Internet Administration, A Brief History, The OSI Model, Layers in the OSI Model, TCP/IP Protocol suite, Addressing, TCP/IP versions. Underlying Technologies: Local Area Networks (LAN), Point-to-Point WAN, Switched WAN, Connecting Devices.	06
2	**Internetworking Infrastructure:** Subnetting and Supernetting, Subnetting, Masking, Example of subnetting, Variable-length Subnetting, Supernetting, Internet Protocol :-Datagram, Fragmentation, Options, Checksum, IP Design, IP Addressing :- Datagram, Fragmentation, Options, Checksum, IP Design, IP Addressing - Introduction, Classful Addressing, Other Issues, A sample internet with classful addresses, Bridging and Interfacing: ARP, RARP, BOOTP, DHCP .	12
3	**Internetworking Routing:** Delivery and Routing of IP Packets ,Routing Protocols - Interior and Exterior Routing, RIP, OSPF, BGP, Internet Control Message Protocol	10

	(ICMP) ,Internet Group Message Protocol (IGMP),Multicast Routing, Multicast Trees, Multicast Routing Protocols, DVMRP, MOSPF, CBT, PIM, MBONE.	
4	**Transport and Application Services:** User Datagram Protocol (UDP)-Process-to-Process Communication, User Datagram, Checksum, UDP Operation, Use of UDP, UDP Design, Transmission Control Protocol (TCP) -Process-to-Process Communication, TCP Services, Segment, Options, Checksum, Flow Control, Error Control, TCP Timers, Connection, State Transition Diagram, Congestion Control, TCP Operation, TCP Design, Domain Name System ,File Transfer Protocol ,Application Layer and Client-Server Model	10
5	**Socket Interface:** Definitions, Sockets, Byte Ordering, Address Transformation, Byte Manipulation Functions, Information about remote host, Socket System Calls, Connectionless Iterative Server, UDP Client-Server Programs, Connection Oriented Concurrent Server, TCP Client-Server Programs.	05
6	**Daemon Process:** Introduction to daemon Process, syslog, Creating daemon Process, i_net daemon.	03
7	**Future Directions:** IPv6, IPv6 Addresses, IPv6 Packet Format, ICMPv6, Transition from IPv4 to IPv6.	02
	Total	**48**

Learning Outcomes:

After completing this course, students will be able to:

- know how internet exchanges data
- know various addressing standards of internet
- know various routing algorithm

Books Recommended:

1. TCP/IP Protocol Suite by **Behrouz A. Forouzan**, Tata McGraw Hill.
2. UNIX Network Programming Volume-1 by **W. Richard Stevens, Bill Fenner and Andrew M. Rudoff**, Addision-Wesley.
3. High-Speed Networks and Internets, Performance and Quality of Service, Second Edition,**William Stallings**, Pearson
4. Internetworking with TCP/IP Volume-2, Client-Server Programming and Applications by **Douglas E. Comer and David L. Stevens**, Prentice Hall