Network Programming

Course Code		Year	IV	Semester	I
Course Category	Honors	**Branch**	CSE	**Course Type**	Theory
Credits	4	**L-T-P**	4-0-0	**Prerequisites**	Computer Networks, Operating System Linux shell Programming, C Programming
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 inter process and inter-system communication	**L2**
CO2	Apply socket programming to implement client-server applications using TCP, UDP Sockets	**L3**
CO3	Apply the concept of Socket Programming to Broadcasting and Multicasting	**L3**
CO4	Analyze the network socket programs to build network applications	**L4**

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2													
CO2	3				3								2	
CO3	3												2	
CO4		3							2	2			2	2

Syllabus	Mapped CO
Unit No. **Contents**	

Unit No.	Contents	Mapped CO
I	**Introduction to Network Programming:** OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application. **Sockets:** Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.	CO1, CO2, CO4
II	**TCP client server :** Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host. **Elementary UDP sockets:** Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP. **I/O Multiplexing:** I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server.	CO1, CO2
III	**Socket options:** getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options. **Advanced I/O Functions-** Introduction, Socket Timeouts, recv and send Functions,readv and writev Functions, recvmsg and sendmsg Functions, Ancillary Data, How Much Data Is Queued?, Sockets and Standard I/O, T/TCP: TCP for Transactions.	CO1, CO4
IV	**Elementary name and Address conversions:** DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information. **Daemon Processes and inetd Superserver –** Introduction, syslogd Daemon, syslog Function, daemon_init Function, inetd Daemon, daemon_inetd Function. **Broadcasting-** Introduction, Broadcast Addresses, Unicast versus Broadcast, dg_cli Function Using Broadcasting, Race Conditions.	CO1, CO3,CO4
V	**Multicasting-** Introduction, Multicast Addresses, Multicasting versus Broadcasting on A LAN, Multicasting on a WAN, Multicast Socket Options, mcast join and Related Functions, dg_cli Function Using Multicasting, Receiving	CO1, CO2, CO3,CO4

	MBone Session Announcements, Sending and Receiving, SNTP: Simple Network Time Protocol, SNTP	

Learning Resources

Text Books

1. UNIX Network Programming, W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, Third Edition, Pearson Education,2015
2. UNIX Network Programming, W. Richard Stevens. Second Edition Pearson,2015

References

1. UNIX Systems Programming using C++, T Chan, First Edition,Pearson,2015
2. UNIX for Programmers and Users, Graham Glass, King abls, Third Edition Pearson Education, 2003
3. Advanced UNIX Programming, M. J. ROCHKIND, Second Edition Pearson Education,2004.

e-Resources & other digital material

1. http://wps.aw.com/aw_kurose_network_2
2. http://www.kohala.com/start/unpv12e.html
3. http://www.netbook.cs.purdue.edu
4. http://www.cs.arizona.edu/llp/book/book.html