राष्ट्रीय प्रौद्योगिकी संस्थान जमशेदपुर
NATIONAL INSTITUTE OF TECHNOLOGY JAMSHEDPUR
(An Institution of National Importance under MHRD, Government of India)

Department of Computer Applications

Autumn Semester 2020-21

Course File

Course Code	: CA35117
Course Title	: Network Programming
Batch	: MCA V Semester
Faculty In-charge	: Dr. Alekha Kumar Mishra
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Contact number	: 8249803116

Course Description: This course will cover the practical aspects of computer network programming, with emphasis on the Internet. We will introduce the students to the TCP/IP protocol stack and some of its important protocols. This course offers an exposure to the implementation of various network services such as ping, I/O asynchronous and Multiplexing , file transfer using UDP and TCP sockets in UNIX environment. It also provides the overview of Network Programming Components for Internet.

Course Objectives:

The goal of this course is to introduce the students to the basics of computer networks and Internet programming. It provides techniques in building well-written, efficient, and protocol independent client and server applications, including publish/subscribe paradigms, using the "Sockets" API as well as other network APIs. The student will also be able to describe what makes a good Network API.

Course Outcomes:

At the end of this course students should able to:
i) Demonstrate working principles of computer networks.
ii) Implement client server socket programming.
iii) Implement TCP/UDP Sockets.
iv) Implment ping, I/O asynchronous and Multiplexing
v) Implment important protocols such as FTP , telnet and routing

Text / Reference Books:

Steven, R., “Unix Network Programming”, Prentice Hall of India, New Delhi, 1994.
Unix system programming using C++, T.Chan, PHI / Pearson Education, rp-2008.2.
Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH,2006

Course Plan:

Lecture – 1	Introduction to UNIX Environment
Lecture – 2	Shell & Basic Commands in UNIX
Lecture – 3	Basic Commands & Shell Scripting
Lecture – 4	Shell Scripting
Lecture – 5	Revision of Computer Networks
Lecture – 6	Communication Protocols Overview
Lecture – 7	Internet Protocols (IP) Architecture
Lecture – 8	IPv4 format and design
Lecture – 9	IP addressing and classification
Lecture – 10	Sub-netting
Lecture – 11	Overview of TCP/IP architecture
Lecture – 12	Fragmentation
Lecture – 13	Network Architecture
Lecture – 14	XNS & UCCP
Lecture – 15	IPX & SPX
Lecture – 16	UDP
Lecture – 17	TCP
Lecture – 18	UDP vs. TCP comparisons
Lecture – 19	An overview of UNIX network commands
Lecture – 20	Introduction to BSD Sockets
Lecture – 21	UNIX Domain Protocols
Lectures – 22-23	Socket Addresses Structure
Lectures – 24-25	TCP Socket System Calls
Lectures – 26-28	TCP Client/Server Examples
Lectures– 29-31	I/O asynchronous and Multiplexing
Lectures – 32-33	Socket implementation options
Lecture – 34	Overview of Winsock
Lecture – 35	Overview of UDP Socket
Lecture – 36	Handling Datagrams using UDP sockets
Lectures – 37-39	UDP Client/Server Examples
Lectures – 40-41	More about UDP socket programming options
Lecture – 42	Audio, Video Data Transmission
Lecture – 43	Router functionality and implementation
Lecture – 44	Search Engines
Lecture – 45	Indexing
Lecture – 46	Crawlers
Lecture – 47	Firewall
Lecture – 48	Time and date routines

Lecture – 49	Ping Implementation
Lecture – 50	Trivial file transfer protocol
Lecture – 51	Remote login & Video conferencing
Lecture – 52-58	Revision and Discussions

Evaluation Scheme:

S.No.	Evaluation Component	Weightage	Nature of Component
1	Mid-term Examination	30%	Online mode
2	End-term Examination	40%	Online mode
3	Teacher's Assessment	30%	Assignment(s) , Presentation, Quiz & Attendance.

Consultation Hours: Mon- 1 to 2 PM ,

Tue, Thu, Fri - 3 to 4 PM.

Dr. Alekha Kumar Mishra.