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## **18BC302 NETWORK PROGRAMMING**

### **Course Description and Objectives:**

Students will explore to UNIX based TCP/IP concepts and socket Programming. Further, they will know the I/O models in the network programming.

### **Course Outcomes:**

The students are able to:

- Familiar with UNIX based TCP/IP concepts and standard internet services.
- Know the usage of data manipulation functions during the network communication
- Understand the TCP and UDP services and related UNIX System Calls.
- Differentiate the concurrent server and iterative server

### **Skills:**

- Design and Develop the TCP based client server programs.
- Design and Develop the UDP based client server programs.
- Implement the concurrent and iterative servers

### **Activities:**

- Design TCP client and server application to transfer file.
- Design a TCP iterative server to convert a given text into upper case using multiplexing system call “select”.
- Design a TCP iterative server to echo given set of sentences using poll functions.
- Design UDP client and server application to echo the given input sentence.
- Design UDP client server to transfer a file.

## **Syllabus**

### **UNIT – 1**

**12 Hours**

NETWORK MODELS AND STANDARDS: 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.

### **UNIT – 2**

**12 Hours**

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.

### **UNIT – 3**

**12 Hours**

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.

**UNIT – 4**

**12 Hours**

I/O MULTIPLEXING AND SOCKET OPTIONS: I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server.

**UNIT – 5**

**12 Hours**

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.

**Test Books:**

1. W. Richard Stevens, “UNIX Network Programming Vol. I Sockets API”, 3<sup>rd</sup> Edition, Pearson, 2015.
2. W.Richard Stevens, “UNIX Network Programming”, 1<sup>st</sup> Edition, PHI, 1990.

**Reference Books:**

1. King abls, “UNIX for Programmers and Users”, 3<sup>rd</sup> Edition, Pearson, 2003.
2. M.J.Rochkind, “Advanced UNIX Programming”, 2nd Edition, Pearson, 2000.