The focus of the course is the **study of the architectural and protocol aspects of computer networking and data communications**. Students get exposure to the technical aspects of networking and network administration/management. In today’s networked world (both at data level and social level), the engineering elements of computer networking have assumed a far greater significance than how things were a decade ago. The course covers not only the foundational concepts of computer networking but also the transition to today’s world of networking: namely, network management & deployment, social networks, and network routing, in a holistic way. This kind of course coverage is useful for students to get jobs in major communication and computer industries such as AT&T, IBM, NEC, Cisco, HP, and Ericsson.

Following are the topics to be covered (along with a programming project on FTP, TCP/IP and UDP/IP):

**Introductory portion (4hrs)**

- Computer networking technology, system components, applications, administration/management, security.

**System Components (22hrs)**

- Circuit, message and packet switching, architectures (OSI 7-layer model)
- Protocols for error/flow control: window protocols (e.g., HDLC)
- Protocols for distributed channel access: CSMA/CD (Ethernet), token bus, CSMA/CA (802.11: wireless network)
- Datagrams and virtual circuits (IP, X.25), routing
- Reliable transport service (e.g., TCP, ISO Class 0-4)

**Applications (8hrs)**

- Electronic mail, Electronic document interchange (EDI)
- Multimedia communications (e.g., teleconferencing) and groupware
- Network file systems, distributed computing

**Network administration (8hrs)**

- OSI Network Management Framework
- Management Information Base (MIB), SNMP Network Management Protocols

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**Text book**