**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY KALYANI**
Autonomous institution under MHRD, Govt. Of India
&
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**Weekly contact** : **3 – 0 – 3 (L – T – P)**
**Course No.** : **CS 602**
**Course Title** : **Computer Networks**
**Instructor-In-Charge** : **Dr. SK Hafizul Islam (hafi786@gmail.com)**

## Scope & Objective

This course will give you a breakdown of the applications, communications protocols, and network services that make a computer network work. We will closely follow the top down approach to computer networking, which will enable you to understand the most visible part, i.e., the applications, and then seeing, progressively, how each layer is supported by the next layer down. The emphasis of this course is to provide hands-on experience, using appropriate examples, to better understand the working of computer networks, so that the students can use the knowledge to better leverage the notions of networking and related aspects for applying in practical applications.

## Suggested Books

- B. A. Forouzan, TCP/IP Protocol Suite, 4th Edition, McGraw-Hill, 2010.
- J. F. Kurose & K. W. Ross: Computer Networking: A Top-Down Approach Featuring the Internet, 3rd Ed., Pearson, 2006.
- B. A. Forouzan, & F. Mosharraf. Computer Networks: A top down approach, 1st Edition, McGraw-Hill, 2012
- B. A. Forouzan, Data Communications and Networking, 4th Edition, McGraw-Hill, 2009.
- W. Stallings, Data and Computer Communication, Prentice Hall.
- A. S. Tanenbaum, Computer Networks, 5th Edition, Pearson, 2006.

## Lecture Plan

| No. | Topics | # Lectures |
|---|---|---|
| 1 | Introduction, Uses of Computer Networks, Modes of Communications, Different types of Networks, Network Structure, Communication Model, Internet, Protocol, OSI and TCP/IP models | 1-2 |
| 2. | Design Issues for the layers, Discussion about Layers | 3-4 |
| 3. | Application Layer: DNS, Remote login (TelNet), Email (SMTP, MIME, POP3, IMAP4) | 5-10 |
| 4. | Application Layer: WWW, HTTP, Cookie, Proxy Server, File Transfer Protocol, TFTP | 11-14 |
| 5. | Transport Layer: Multiplexing, Demultiplexing, UDP, TCP | 15-17 |
| 7. | TCP: RTT Estimation and Timeout, TCP Flow Control. TCP Error Control and Congestion Control. Introduction to SCTP | 18-20 |
| 8. | Network Layer: Virtual Circuits and Datagram Networks, Inside a Router, Forwarding and Addressing in the Internet. IPv4 Addressing | 21-24 |
| 9. | Routing Algorithms: Shortest Path, Flooding, Link State, Distance Vector, Hierarchical Routing. | 25-27 |
| 10. | Routing in the Internet: RIP, OSPF, Border Gateway Protocol, and Multicasting. | 28-30 |
| 11. | Data Link Layer: Services, Error Detection and Correction Techniques | 31-32 |
| 12. | Multiple Access Protocol: TDM, FDM, Slotted ALOHA, Pure ALOHA, CSMA, CSMA/CD, LAN, Ethernet, Point to Point Protocol. | 33-35 |
| 13. | Link Layer Addressing: MAC Addresses, ARP, DHCP | 36-38 |

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| 14. | Interconnections: Hubs, Bridges, and Switches. | 39-41 |
| 15. | Physical Layer | 42-45 |

**Evaluation Scheme**

| Component | Weightage | Duration |
|---|---|---|
| Attendance | 5% | NA |
| Assignment/Surprise Quiz/Project | 15% | NA |
| Mid-Sem. Examination | 30% | 90 mins. |
| End-Sem, Examination | 50% | 3 hours |

**Notices:** All notices related to the course will be put up on the institute notice board only.
**Chamber consultation hour:** Will be announced in the class.
**Make-Up Policy:** As per institute rules.

**Instructor-In-Charge**
**CS 602**