INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT./CENTRE**:** **Electronics and Computer Engineering**

1. Subject Code**: EC – 555N**   Course Title**: Advanced Computer Networks**

2. Contact Hours: **L: 3**   **T: 0**   **P: 0**

3. Examination Duration (Hrs.):   **Theory** **0** **3** **Practical** **0** **0**

4. Relative Weight**:**   **CWS** **15** **PRS** **00** **MTE** **35** **ETE** **50** **PRE** **00**

5. Credits**:** **0** **3**   6. Semester   **√**

   Autumn   **Spring**   **Both**

7. Pre-requisite**: EC - 356**

8. Subject Area**: MSC**

9. Objective: To provide to the students an in-depth understanding of networking.

10. Details of the Course:

Sl. No.	Contents	Contact Hours
1.	**Review:** Computer networks and layered architecture.	2
2.	**Asynchronous Transfer Mode:** ATM layered model, switching and switching fabrics, network layer in ATM, QOS, LAN emulation.	4
3.	**Transport Layer:** Elements of transport protocols; Internet transport protocols: TCP and UDP, TCP connection management, congestion control.	6
4.	**Application Layer:** Network application architectures: Client-server, P2P and hybrid; Application layer protocols: DNS, FTP, TFTP, TELNET, HTTP and WWW, SMTP and electronic mail; Network management and SNMP	8
5.	**Wireless and Mobile Networks:** Wireless links and network characteristics, 802.11 wireless LANs, mobility management, addressing and routing, mobile IP, WAP, mobility in cellular networks.	8
6.	**Multimedia Networking:** Streaming audio and video, RTSP, jitter removal and recovery from lost packets; Protocols for real-time interactive applications: RTP, RTCP, SIP, H.323; Content distribution networks; Integrated and differentiated services, RSVP.	8
7.	**Introduction to Network Security:** Cryptography, symmetric and public-key algorithms, digital signatures, communication security, authentication protocols, E-mail security, PGP and PEM.	6
	Total	**42**

11. Suggested Books:

Sl. No.	Name of Books / Authors	Year of Publication
1.	Tanenbaum, A. S., "Computer Networks", 4th Ed., Pearson Education.	2003
2.	Forouzan, B. A., "Data Communication and Networking", 3rd Ed., Tata McGraw-Hill	2004
3.	Kurose, J. F. and Ross, R.W., "Computer Networking", 3rd Ed., Pearson Education	2005
4.	Stallings, W., "Network Security and Cryptography", 4th Ed., Prentice-Hall of India.	2006
5.	Comer, D.E. and Droms, R.E., "Computer Networks and Internets", 4th Ed., Prentice-Hall.	2004
6.	Stevens, W.R., "TCP/IP Illustrated, Volume 1", Pearson	2000
7.	Walrand, J. and Varaiya, P., "High Performance Communication Networks", 2nd Ed., Morgan Kaufmann.	2000