MANIPAL UNIVERSITY JAIPUR

School of Electrical, Electronics & Communication Engineering (SEEC)

Department of Electronics & Communication Engineering
Course Hand-out

Communication Networks| EC 1505 | 4 Credits

Session: July 14 – Dec. 14 | Faculty: Ms. Pallavi Yarde | Class: Core Course

Course Outcomes: At the end of the course, students will be able to

[EC1505.1] Build an understanding of the fundamental concepts of computer networking.
[EC1505.2] Familiarize the student with the basic taxonomy and terminology of the computer networking area.
[EC1505.3] Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
[EC1505.4] Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks and enhancing the employability.

A. SYLLABUS

Introduction to communication networks: Uses of computer networks, types of networks, network hardware, network software, network design issues, network design tools, ISO-OSI reference model, TCP/IP reference model, Examples networks, Network standardization. Switching techniques, Multiplexing and Multiple Access techniques, Packet Switched Networks; Circuit switched network: Transmission, switch mode, integrated – services digital network (ISDN) ISDN services, ISDN interface, ISDN system architecture, the digital PBX signaling, perspective on ISDN, applications for global ISDN and future trends; Local area network: Data link layer, error detection and correction, elementary data link protocol, sliding
window protocols, data link control, HDLC standard, Channel allocation, multiple access protocol, IEEE standards, fiber optic networks, LANs and Network of LANS; Packet switched network: Routing algorithms, congestion control algorithm, internetworking, network layer in internet, internet control protocols, limitations of IPv4, Introduction to IPV6 Protocol IP addressing, networking devices, data links and transmission, Wireless Networks and Mobile IP. Transport and end to end protocols, congestion control techniques, the internet transport protocol TCP and UDP, performance issues, connection management Handshaking; Advanced concepts: Application layer and network management, Network Security. Packet Queues and delays, Little's theorem, Birth and death process, Queuing disciplines, M/M/1 Queues, Traffic models, ATM Networks, Quality of service and resource allocation, VPNs and MPLS, Cellular Telephone and Optical networks, VOIP and Multimedia networking. Mobile Adhoc Networks, satellite networks and Wireless Sensor Networks.

B. References

1. N. F. Mir, "Computer and Communication Networks", Pearson Education, 2007
2. Garcia and Widjaja, "Communication Networks", McGraw Hill, 2006
3. J.F. Hayes, "Modelling and analysis of Computer Comm. Networks", Plenum, 1984.
4. J. Walrand & P. Varaiya, "High Performance Communication Networks", Morgan Kaufmann Publishers, 2002.

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