Course Outline

Title	**Data Communications and Computer Networks**
Code	
Credit Hours	3 ***Theory/week:*** Weight 3 Cr. Hrs. Contact Hours 3 Hrs. Lectures: 2 Duration 1.5 Hrs./Lecture
Prerequisite	
Follow Up	
Category	
Aims and Objectives	In this course we will concentrate on data communication concepts, issues, and technologies. It highlights the importance and need of simple, clear communication in today's world. We know that our success is driven by the constant and reliable exchange of information. Discussion topics will include an overview of the various aspects of modern data and communications, and as well as the emerging technologies. The objectives of this course are as: ♦ Comprehend the terminology, concepts, applications and metrics of data communications and computer networks. ♦ Demonstrate knowledge of principles of computer network architectures and data communications. ♦ Understand the technical aspects of data transmission in networks. ♦ To examine and understand network protocols and architecture. ♦ Understand security issues in computer networks. ♦ Recognize the present and future impact of advancements in data communications and networks.
Learning Outcomes	This course aims to introduce the students to the fundamentals and applications of data communications and Computer Networks in the form of a Local Area Network or a Wide Area Network. On completion of this course students should be able to: ♦ Understand the concepts and components of data communications and networking ♦ Understand applications of data communication networks in a wide-range of environments ♦ Identify appropriate alternatives for developing and implementing data communication networks within and across enterprises ♦ Appreciate issues pertaining to effective management of data communication networks
Syllabus	Topics: ♦ Fundamentals of data communications: data communications standards, data transmission, Analog and digital transmission, transmission media and equipment, data encoding schemes, multiplexing, error and flow control, interfacing. ♦ Computer networks: local area networks, metropolitan area networks and wide area networks, switching techniques, network topologies, LAN and WAN technologies, network devices, network security. ♦ Protocols and standards: OSI model, TCP/IP overview, network, transport, and application layer protocols.
Text Book/s	A. Data and Computer Communications by William Stallings, Eighth Edition, Prentice Hall B. Data Communications and Networking by Behrouz A. Forouzan, Fourth Edition, McGraw-Hill
Reference Material	1. Data Communications and Computer Networks by Curt M. White, Course Technology – Thomson Learning 2. Computer Networks by Andrew S. Tanenbaum, Third Edition, Prentice Hall 3. Communication Networks by Leon-Garcia & Widjaja, McGraw-Hill 4. Understanding Data Communications & Networks by William A. Shay, Second Edition, Brooks/Cole Publishing 5. Computer Networks and Internets by Douglas Comer, Prentice Hall 6. Data Communications by Fred Halsall, Computer Networks, and Open Systems, Addison-Wesley

Instructional Aids/Resources	• Windows XP Professional • Microsoft PowerPoint • Macromedia Flash 5 • White Board and Marker • Seminar Hall for Presentations • Computer Labs. for Hands-on Training • Multimedia • Photocopy Facility for Handouts, Quizzes, and Tests

Assessment Criteria	**Sessional 20%**	**Mid 20%**	**Final 60%**	**Total 100%**
	Quizzes and Test 05			
	Assignment and Presentations 10			
	Attendance and Class Participations 05	Paper 20	Paper 60	

Recommendations	

Framework					
Week	**Lecture**	**Article No.**	**Topic**	**Source** (Book-Chapter No. Section No.)	**Recommendations for Learning Activities** (Mention Assignments, Test, Quizzes, Practical, Case Study, Projects, Lab Work or Reading Assignments)
1	1	1.2, 1.1, 1.3	Introduction of the Course; Course Outline Overview, Data Communications, Basic elements of dada communications, Computer networks and its types	A-1.2, A-1.1, A-1.3, B-1.2	Distribution of course outline
	2	2.1,1.4 2.2	Data communications standards, Layered architecture	A-2.1, B-1.4 A-2.2	
2	3	2.3	The OSI reference model	A-2.3, B-2.2	Assignment 1
	4	3.1 3.2	Data and signals, Fundamentals of signals	A-3.1, B-3.1 A-3.2, B-3.2	
3	5	3.2	Data Transmission Analog and digital transmission Parallel and serial transmission	A-3.2, B-4.4	
	6	6.1 6.5	Asynchronous and synchronous transmission Transmission modes	A-6.1, A-6.5, B-1.1	
4	7	3.3, 3.4	Transmission Impairments, Channel Capacity	A-3.3, A-3.4	Test 1
	8	4.1	Transmission media Wired Transmission Media	A-4.1	
5	9	4.2	Wireless Transmission Media	A-4.2, B-7.2	
	10	5.1	Digital Data, Digital Signals	A-5.1	Assignment 2
6	11	5.2	Digital Data, Analog Signals	A-5.2	
	12	5.3, 5.4	Analog Data, Digital Signals, Analog Data, Analog Signals	A-5.3, A-5.4	
7	13	6.3, 7.2	Error Detection, Error Control	A-6.3, A-7.2	
	14	7.1, 7.3	Flow control High level data link control (HDLC)	A-7.1, A-7.3	Test 2
8	15	6.6	Interfacing Modems	A-6.6	
	16		Revision		
Mid-Term Exam					
9	17	8.1	Frequency Division Multiplexing	A-8.1	
	18	8.2 8.3	Time Division Multiplexing	A-8.2, A-8.3	
10	19	10.1, 10.2, 10.3	Circuit Switching	A-10.1, A-10.2, A-10.3	Assignment 3
	20	10.6	Packet switching	A-10.6	

11	21	15.2 15.3	Network Topologies IEEE 802 Reference Model, a LAN Standard	A-15.2, A-15.3	
	22	16.2, 16.3, 16.4	LAN Technologies	A-16.2, A-16.3, A-16.4	
12	23	18.2 18.3	WAN Technologies	B-18.2, B-18.3	Test 3
	24	16.1	Internetworking Devices Hubs Bridges Switches Routers	B-16.1	
13	25	2.4, 20.2	TCP/IP Overview Internet Protocol (IP)	A-2.4, B-20.2	
	26	19.2	IP Addressing, Subnetting	B-19.2	Assignment 4
14	27	20.1, 20.3	Address Resolution Protocol (ARP), Internet Control Message Protocol (ICMP)	B-20.1, B-20.3	
	28	22.2, 22.3	Transport Layer Protocols User Datagram Protocol (UDP) Transmission Control Protocol (TCP)	B-22.2, B-22.3	
15	29	25.1, 25.2,3,4,5 26.1	Application Support Protocols Domain Name System (DNS) Electronic Mail (SMTP)	B-25.1, B-2, 3,4,5, B-26.1	
	30	26.2, 27.1, 27.2	File Transfer Protocol (FTP) Hyper Text Transfer Protocol (HTTP) World Wide Web (WWW)	B-26.2, B-27.1, B-27.2	Test 4
16	31	21.1 21.2 21.3	Network Security	A-21.1, A-21.2, A-21.3	
	32		Revision		
Final-Term Exam					