

CE257: DATA COMMUNICATION & NETWORKING

Credits and Hours:

Teaching Scheme	Theory	Practical	Tutorial	Total	Credit
Hours/week	4	2	-	6	5
Marks	100	50	-	150	

Pre-requisite courses:

- N/A

Outline of the Course:

Sr. No.	Title of the unit	Minimum number of hours
1.	Introduction and Basic Concepts	04
2.	Network Model	04
3.	Signals	04
4.	Digital and Analog Transmission	09
5.	Multiplexing	06
6.	Data Transmission	02
7.	Error Correction and Detection	05
8.	Data Link Control	04
9.	Media Access Control	06
10.	Switching	01
11.	Wired and Wireless LAN	09
12.	Network Routing	06
	Total hours (Theory) :	60
	Total hours (Lab) :	30
	Total hours :	90

Detailed Syllabus:

1.	Introduction and Basic Concepts	04 Hours	6%
	Data Communication, Networks, Network Types, Internet History, Standards and Administration		
2.	Network Model	04Hours	6%

	Protocol Layering, TCP/IP Protocol Suites, The OSI Model		
3.	Signals	04 Hours	6%
	Data and Signals, Periodic Analog Signal, Digital Signal, Transmission Impairment, Data Rate limits, Performance		
4.	Digital and Analog Transmission	09 Hours	15%
	Transmission Modes, Digital to Digital Conversion, Analog to Digital Conversion, Digital to Analog Conversion, Analog to Analog Conversion		
5.	Multiplexing	06 Hours	11%
	Frequency division Multiplexing, Wave length division Multiplexing, Time division Multiplexing, Multiplexing applications, Spread Spectrum		
6.	Data Transmission	02 Hours	3%
	Guided Media, Unguided Media,		
7.	Error Correction and Detection	05 Hours	8%
	Types of Errors, Redundancy, Detection versus correction, Block Coding, Cycle Coding, Checksum		
8.	Data Link Control	04 Hours	6%
	DLC Services, Data Link Layer Protocol, HDLC, Point-to-point Protocol		
9.	Media Access Control	06 Hours	11%
	Random Access, Controlled Access, Channelization		
10.	Switching	01 Hours	2%
	Circuit Switching, Packet Switching		
11.	Wired and Wireless LAN	09Hours	15%
	Ethernet Protocol, Standard Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless characteristics and access control, IEEE 802.11 project.		
12	Network Routing	06 Hours	11%
	Unicast Routing, Routing Algorithms, Unicast Routing Protocols: IS,RIP,OSPF		

Course Outcome (COs):

At the end of the course, the students will be able to

CO1	Understand and identify different physical layer transmission fundamentals such as types of signals, transmission, multiplexing, types of medium and modulation.
CO2	Evaluate existing layer-2 networking standards and implementations.
CO3	Evaluate key networking protocols, and their hierarchical relationship in the context of a conceptual model, such as the OSI and TCP/IP framework.
CO4	Understand existing different medium access protocols and evaluate for adoption for future networking.
CO5	Understand and differentiate functionality of existing network routing protocols.
CO6	Measure different network parameter such as Throughput & different types of delays.

Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	-	1	-	-	-	-	-	-	-	2	-	-
CO2	1	2	1	1	2	-	-	-	-	-	-	2	1	1
CO3	3	2	2	1	2	-	-	-	-	1	-	2	1	1
CO4	2	3	1	1	1	-	-	-	-	2	-	2	-	-
CO5	3	2	3	1	3	-	-	-	1	1	-	3	1	1
CO6	3	3	3	2	3	-	-	-	2	2	-	3	3	2

Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

Recommended Study Material:❖ **Text book:**

1. Data communication & Networking, BahrouzForouzan, McGraw-Hill

❖ **Reference book:**

1. Data and Computer Communications, William Stallings, Prentice Hall
2. Computer Network, Andrew S. Tanenbaum, Fourth Edition, Prentice Hall

❖ **Web material:**

1. www.wikipedia.org
2. <http://www.webopedia.com>

❖ **Software:**

1. Wireshark
2. Cisco Packet Tracer