



**Course Description and Outcome Form**  
Department of Computer Science and Engineering  
School of Engineering and Computer Science  
Brac University

**A. Course General Information:**

Course Code:	CSE 320
Course Title:	Data Communication
Credit Hours (Theory):	3+0
Contact Hours (Theory):	3
Category:	Core
Type:	Lecture
Prerequisites:	None
Co-requisites:	None

**B. Course Catalog Description (Content):**

This course will present an introduction to purpose and methods of communication. First of all, the course will cover the principles of networking by using the protocol layering of the Internet and the TCP/IP protocol suite. Starting from the Physical layer, this course will cover the concepts of analog and digital data and signals, their performance measurements, effects of noise and control. Next, some basic concepts such as data rate limits, analog to digital conversion methods, modulation and bandwidth utilization techniques are discussed in this course. Lastly, Data Link layer concepts and services such as error detection and multiple-access protocols are explained.

**C. Course Objective**

- 1) Introduce Students with fundamental concepts of data communication
- 2) Explain the principles of networking by using the protocol layering of the Internet
- 3) Teach necessity for modulation, analog to digital conversion methods and different multiplexing techniques
- 4) Explain effects of noise, error detection and control etc.

**D. Course Outcomes (COs):**

Upon successful completion of this course, students will be able to

Sl.	CO Description	Weightage (%)
CO1	<b>Describe</b> the elements of data communication with different network topologies and the functionality of each protocol layer of two network models: OSI and TCP/IP	20
CO2	<b>Understand</b> the basics of signal, bit and performance measurements and learn different conversion techniques (from analog to digital and digital to digital) based on their advantages and disadvantages.	30
CO3	<b>Explain</b> different ways of bandwidth utilization: Multiplexing and Spreading approaches	25
CO4	<b>Discuss</b> Data-link layer concepts, services and various multiple-access protocols	25

**E. Mapping of CO-PO-Taxonomy Domain & Level- Delivery-Assessment Tool:**

Sl.	CO Description	P O s	Bloom's taxonomy domain/level	Delivery methods and activities	Assessment tools
CO1	<b>Describe</b> the elements of data communication with different network topologies and the functionality of each protocol layer of two network models: OSI and TCP/IP	a	Cognitive/Understand	Lectures, notes	Mid and Final Exam
CO2	<b>Understand</b> the basics of signal, bit and performance measurements and learn different conversion techniques (from analog to digital) based on their advantages and disadvantages.	a	Cognitive/Understand	Lectures, notes	Mid and Final Exam
CO3	<b>Explain</b> different ways of bandwidth utilization: Multiplexing and Spreading approaches	b	Cognitive/Analyze	Lectures, notes	Mid and Final Exam
CO4	<b>Discuss</b> Data-link layer concepts, services and various multiple-access protocols	b	Cognitive/Analyze	Lectures, notes	Mid and Final Exam

**F. Course Materials:****i. Text and Reference Books:**

Sl.	Title	Author(s)	Publication Year	Edition	Publisher	ISBN
1	Data Communication and Networking	Behrouz A. Forouzan	2017	5 <sup>th</sup>	McGraw Hill	ISBN 10: 1259064751
2	Data and Computer Communications	William Stallings	2013	10 <sup>th</sup>	Pearson	ISBN-10: 0133506487

**ii. Other materials (if any)**

Lecture Notes and presentation slides

**G. Lesson Plan:**

No	Topic	Week	Related CO (if any)
1	Introduction to elements of data communication, Network topology, Protocols and standards,	<b>Week 1</b>	CO1
2	Network models: OSI and TCP/IP model	<b>Week 2</b>	CO1

3	Basics concepts of signal: Analog and digital signal and their properties, Transmission impairment, Data rate limit calculation	<b>Week 3</b>	CO2
4	Digital to Digital conversion- Line coding, Block coding and Scrambling techniques	<b>Week 4</b>	CO2
5	Analog to Digital conversion techniques- PCM, DM.	<b>Week 5</b>	CO2
Mid Exam (Week 6)			
6	Digital to Analog conversion techniques- ASK, FSK, PSK	<b>Week 7</b>	CO2
7	Bandwidth utilization: Multiplexing and spreading, FDM, WDM, Synchronous Time-Division Multiplexing	<b>Week 8</b>	CO3
8	Bandwidth utilization: Multiplexing and spreading, FHSS and Direct sequence spread spectrum.	<b>Week 9</b>	CO3
9	Data link layer concepts, services and multiple-access protocols: Channel Partitioning, Random Access and Taking Turns protocols.	<b>Week 10</b>	CO4
10	Different types of error detection and correction mechanisms in the Data Link layer: Hamming distance, Block coding, CRC, Checksum.	<b>Week 11</b>	CO4
Final Exam ( Week 12)			

#### H. Assessment Tools:

<b>Assessment Tools</b>	<b>Weightage (%)</b>
1. Participation in class	5%
2. Quizzes/Class Tests	15%
3. Mid Term Examination	25 %
4. Assignments	15 %
5. Final	40%

#### I. CO Assessment Plan:

<b>Assessment Tools</b>				
	<b>CO1</b>	<b>CO2</b>	<b>CO3</b>	<b>CO4</b>

Quizzes	x	x	x	x
Assignments	x	x	x	x
Examinations	x	x	x	x

**J. CO Attainment Policy:**

As per Department of CSE course outcome attainment policy

**K. Grading policy:**

As per Brac grading policy

**L. Course Coordinator:**

**Mehnaz Seraj (SRJ)**

**Md. Ahasanul Alam (AHU)**