

Data Communication BLM3051



Furkan ÇAKMAK

1

Lecture Information

BLM3051
Data
Communication
Week 1

- Course Hours: **Tuesday 09:00 - 11:50**
- All courses will be face 2 face.
- For announcements: <https://avesis.yildiz.edu.tr/fcakmak/dokumanlar>
 - USIS Course/Bulk Messaging System
 - Google Classroom Class Code: **7pdfuwv**
 - You can ask your questions via Google Classroom
 - Zoom Personal Room:
 - <https://us04web.zoom.us/j/3752287039?pwd=TTFKNittZWJTUEhHREovckl0VTVYUT09>
 - Meeting ID: 375 228 7039
 - Passcode: 5AXMNd
- For your questions and consultations about the course, make an appointment **AT LEAST 1 (ONE) DAY BEFORE** via the link below.
 - <https://fcakmak.simplybook.it/v2/>
 - No appointment will be made by e-mail.
 - Please be at the above mentioned Zoom room at the appointment time.

Furkan Çakmak

2

Lecture Information Form - Weekly Subjects

BLM3051
Data
Communication
Week 1

Week	Date	Subjects
1	04.10.2022	Introduction to Data Communication Standards Used on Data Communication, Architectural models
2	11.10.2022	OSI Reference Model , Layers and Their Functions
3	18.10.2022	Signaling and Signal Encoding
4	25.10.2022	Parallel and Serial Transmission, Communication Media and Their Technical Specs., Multiplexing (TDM, FDM)
5	01.11.2022	Error Detection and Error Correction Techniques
6	08.11.2022	Data Link Control Techniques, Flow Control
7	15.11.2022	Asynchronous and Synchronous Data Link Protocols (BSC, HDLC)
8	22.11.2022	1. Vize Haftası
9	29.11.2022	LAN Technologies Continued, IEEE 802.4, 802.5, 802.11
10	06.12.2022	Connectionless and Connection Oriented Services, Switching
11	13.12.2022	Wide Area Networking Technologies (X.25, ISDN, FR, ATM, xDSL.)
12	20.12.2022	Communications Equipment's, TCP/IP Model, Security Issues
13	27.12.2022	Research Presentation 1
14	03.01.2022	Research Presentation 2

Furkan ÇAKMAK

4

Lecture Information Form- Coursebook

BLM3051
Data
Communication
Week 1

	Coursebooks
1	Introduction to Data Communications & Networking, Behrouz Foruzan
2	Computer Networks 2e, Andrew S. Tanenbaum
3	Data Networks: Concepts, Theory and Practice, Uyles D.Black
4	Routing & Switching: Time of convergence, Puzmanova

Furkan ÇAKMAK

5

Lecture Information Form - Evaluation

BLM3051
Data
Communication
Week 1

Evaluation System	Method	#	Impact (%)
	Midterms	1	30
	Quizzes	-	-
	Homeworks	1 (+1)	30
	Projects	-	-
	Semester Project	-	-
	Laboratory	-	-
	Other	-	-
	Final Exam	1	40

Furkan ÇAKMAK

6

Lecture Information Form - Program Outcomes

BLM3051
Data
Communication
Week 1

1c	Bilgisayar Mühendisliği alanında yeterli bilgi birikimi alma
1d	Bilgisayar Mühendisliği alanında aldığı bilgi birikimini karmaşık mühendislik problemlerine uygulayabilme becerisi
4b	Bilişim teknolojilerini etkin bir şekilde kullanma becerisi
9b	Mühendislik uygulamalarında kullanılan standartlar hakkında bilgi kazanması
12b	Veri Yapıları hakkında bilgi kazanılması
12c	Algoritmalar hakkında bilgi kazanılması
12d	İstatistik ve Olasılık hakkında bilgi kazanması

Furkan ÇAKMAK

7

What is Communication?

BLM3051
Data
Communication
Week 1

- Sharing information/data
- Telecommunication (Tele -> far *Greek)
- Communication Aim: Traffic data
- Telephone, Television, vb.
 - Ses, video, resim
- Computer
 - Medium/Media -> 0/1
- Protocol Stack: Software and Hardware

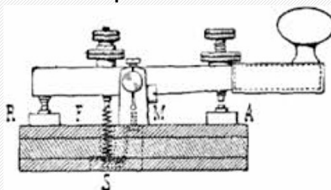
Furkan Çakmak

8

What is Communication? - Con't

BLM3051
Data
Communication
Week 1

- Humanity History: 200k
- Sumerians: B.C 4000
- «*Verba volant, scripta manent*»
- Copper Cable
 - Telegraph: 1837-1838
 - Telephone: 1876



Furkan Çakmak

9

Essentials of Data Communication

BLM3051
Data
Communication

Week 1

- Message
- Sender
- Receiver
- Medium
- Protocol



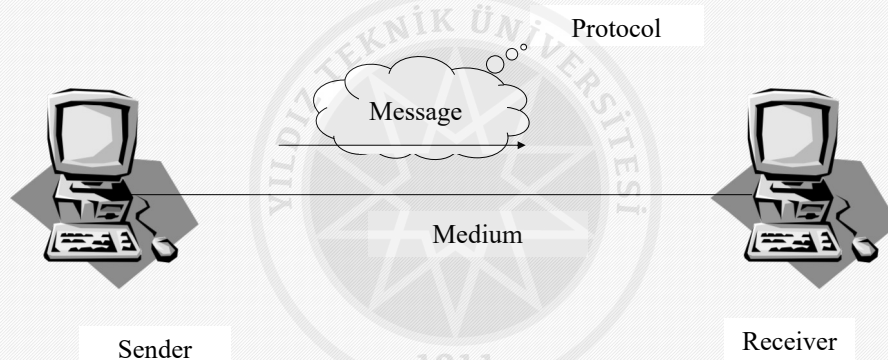
Furkan Çakmak

10

Data Communication

BLM3051
Data
Communication

Week 1



Furkan Çakmak

11

Data Comm. Features

BLM3051
Data
Communication
Week 1

- Delivery
- Accuracy
- Timeliness



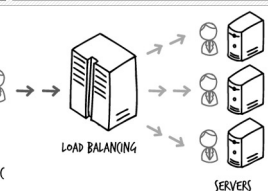
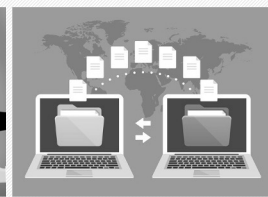
Furkan Çakmak

12

Pros of Computer Network

BLM3051
Data
Communication
Week 1

- Resource Sharing
- Info/Data Sharing
- Load Sharing / Balancing
- Reliability
- Economy
- Efficient communication between in different places



Furkan Çakmak

13

Evaluation Criteria for Computer Networks

BLM3051
Data
Communication
Week 1

- Performance
 - Transmit time
 - Response time
- QoS
 - Circuit-switched (Synchronous) → Bit rate, Min Error Rate, Transmission Rate
 - Packet-switched (Asynchronous) → Maximum Packet Size, Mean Packet Transfer Rate, Mean Packet Error Rate, Jitter, Mean Packet Transmit Delay
- Reliability/Availability
 - MTBF - Mean Time Between Failure
 - Restoring Time
 - 5-9 → 99,999%
- Security
- Scaleable
- Adaptable
 - Software, Hardware

Furkan Çakmak

14

Network Standards

BLM3051
Data
Communication
Week 1

- De Jure
 - ISO (International Organization for Standardization)
 - ITU (The **I**nternational Telegraph and **T**elephone Consultative Committee)
 - IEEE (The Institute of Electrical and Electronics Engineers)
 - ETSI (The European Telecommunications Standards Institute)
 - EIA (Energy Information Administration)
 - TIA (Telecommunications Industry Association)
 - ANSI (American National Standards Institute)
 - TSE (Türk Standartları Enstitüsü)
 - IETF (Internet Engineering Task Force)
- De Facto
 - QWERTY keyboards
 - VHS video format
 - PDF document type
 - Buttons on men's shirts are on the right, buttons on women's shirts are on the left.

Furkan Çakmak

15

Computer Network (CN)

BLM3051
Data
Communication

Week 1

- ARPANET (1970s)
- Classification of CN
 - Technique of Transmission
 - Broadcast
 - Peer to peer - P2P
 - Network Dimension
 - PAN-Personal Area Network (< 10m)
 - LAN-Local Area Network (< 100m-200m)
 - CAN-Campus Area Network (< 1-5km)
 - MAN-Metropolitan Area Network (< 10-50km)
 - RAN-Regional Area Network (< 100-200km)
 - WAN- Wide Area Network (< 1000km)
 - Bit Rate

10Gbps	Çok yüksek hızlı LAN				
1Gbps	Yüksek hızlı LAN	MAN	Yüksek hızlı WAN		
100Mbps	Hızlı LAN				
10Mbps	Düşük hızlı LAN		WAN		
1Mbps					
100kbps					
10kbps					
	10m	100m	1Km	10Km	100Km
					1Mm

Furkan Çakmak

16

Topology

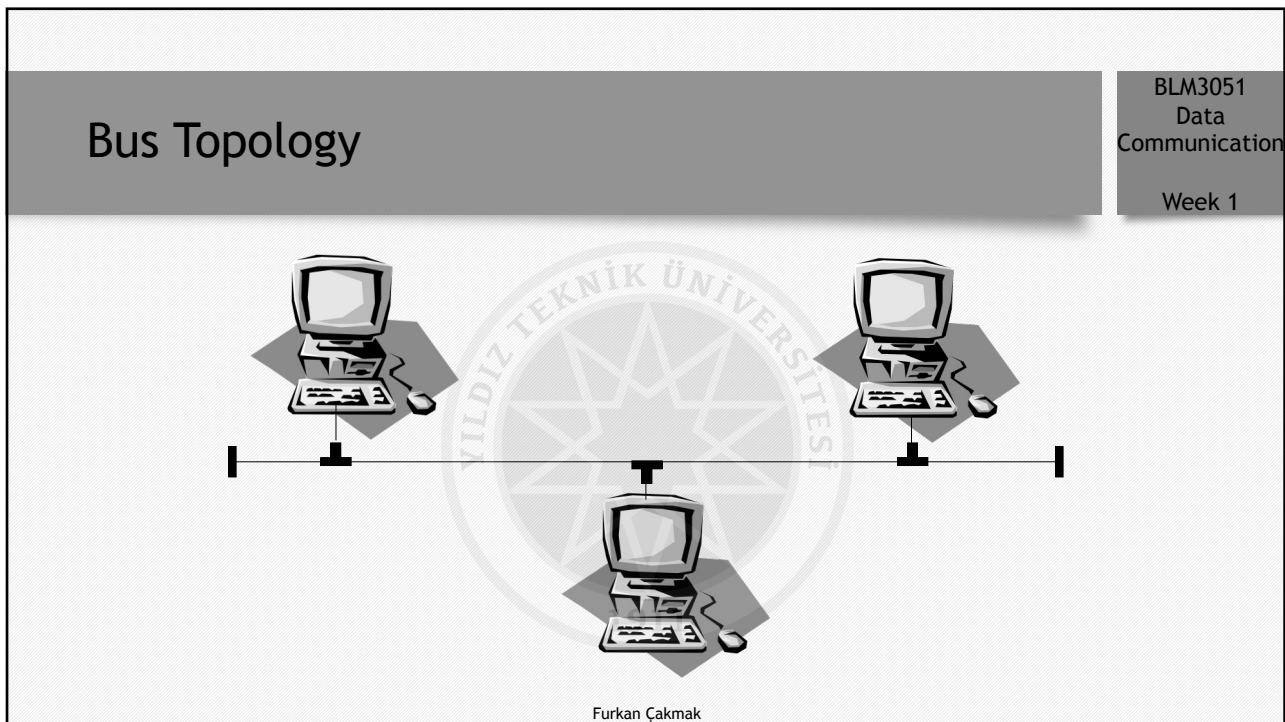
BLM3051
Data
Communication

Week 1

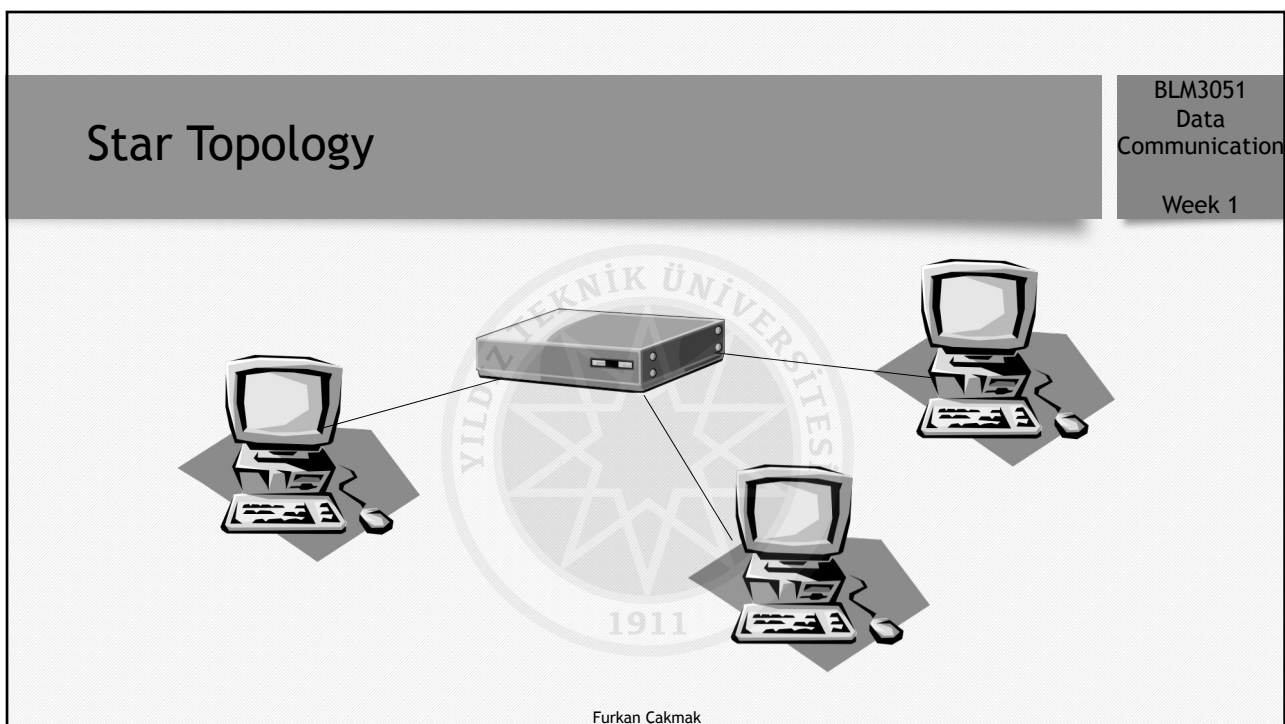
- Bus
- Star
- Tree
- Ring
- Mesh
- Hybrid

Furkan Çakmak

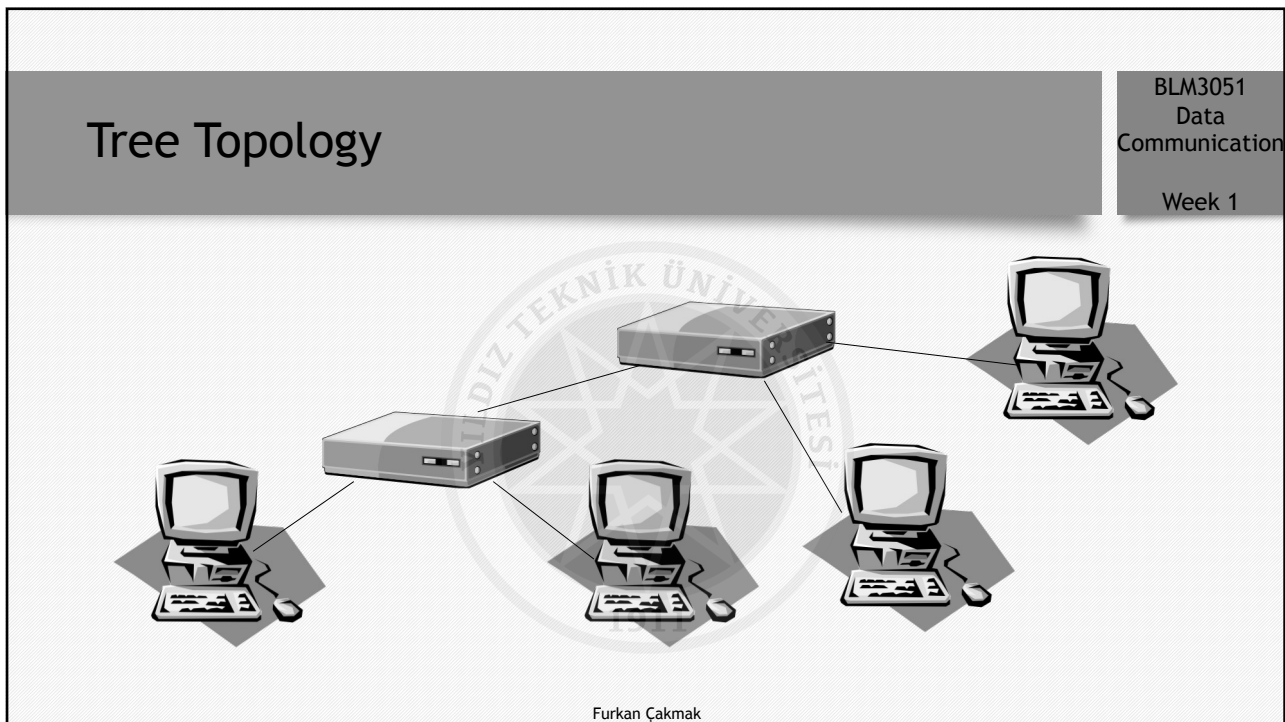
17



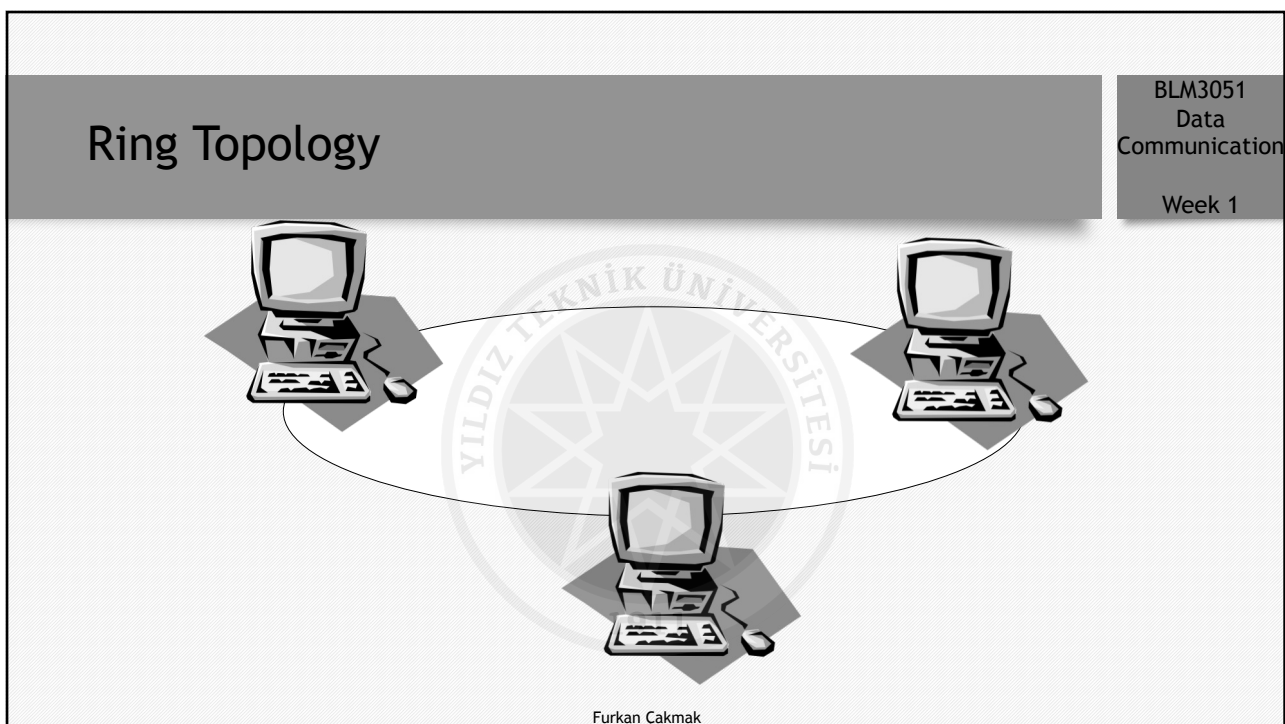
18



19



20

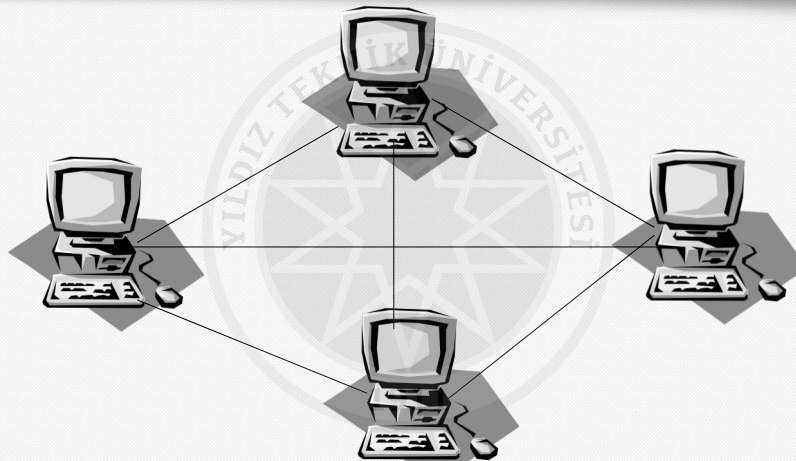


21

Mesh Topology

BLM3051
Data
Communication

Week 1



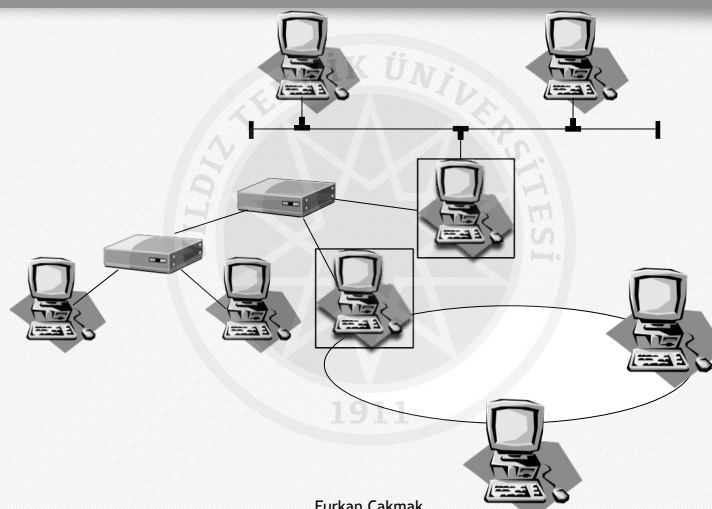
Furkan Çakmak

22

Hybrid Topology

BLM3051
Data
Communication

Week 1



Furkan Çakmak

23

Transmission Model

BLM3051
Data
Communication

Week 1

- Simplex
 - Mouse
 - Bar Code Reader
- Half-Duplex
 - Radio
- Duplex
 - LAN



Furkan Çakmak

24

Addressing Model

BLM3051
Data
Communication

Week 1

- Broadcast
 - TV
- Multicast
 - Stream Video
- Anycast
 - DNS
- Unicast
 - Letter



Furkan Çakmak

25

Data Flow Density, Bit Rate, Throughput

BLM3051
Data
Communication
Week 1

- Symmetric
- Asymmetric
- bps (bit-ps), Bps (Byte-ps)
 - Kilo (k), Mega (M), Giga (G), Tera (T), Peta (P), Exa (E), Zetta (Z) ve Yotta (Y)
- Throughput
- Response time
- Jitter

Furkan Çakmak

26

Thank you for your listening.

BLM3051
Data
Communication
Week 1



Furkan Çakmak

28