

Bahan Ajar

Chapter 1



Materi Pembelajaran

Matakuliah :

# WIRELESS SENSOR NETWORKS

Kode Matakuliah : SKO 20428

Prodi : **SISTEM KOMPUTER**

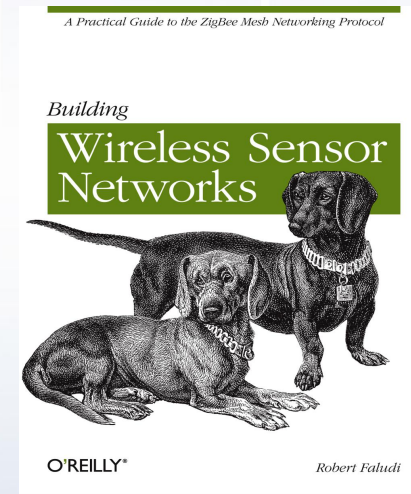
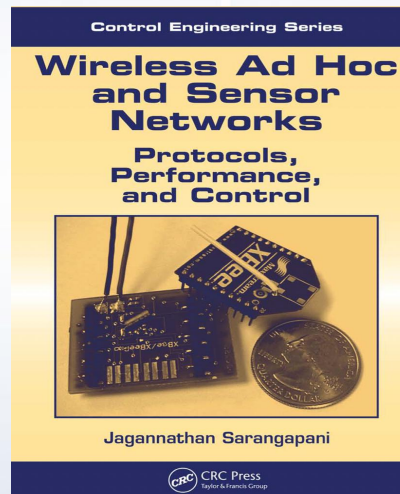
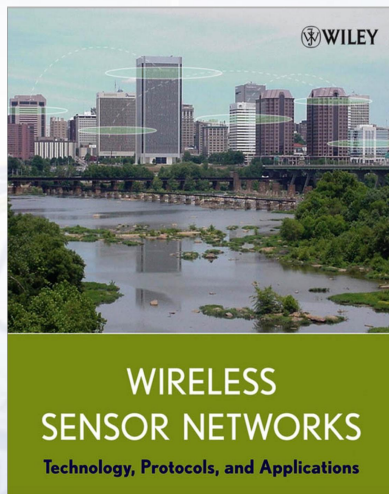
Dosen Pengampu Matakuliah:

Bayu Nugroho, S.Kom., M.Eng

# Introduction

## WIRELESS SENSOR NETWORKS

- Kontrak Perkuliahan & Instrument Assessment
- Rencana Pembelajaran Semester (RPS)
- Tugas Mandiri (Teori & Praktikum)
- Buku Acuan :



# Tables of Content

Elements of a Communication System

Types of Signals

- Analog Signals
- Digital Signals
- Periodic Signals
- Aperiodic Signals
- Discrete-time signal

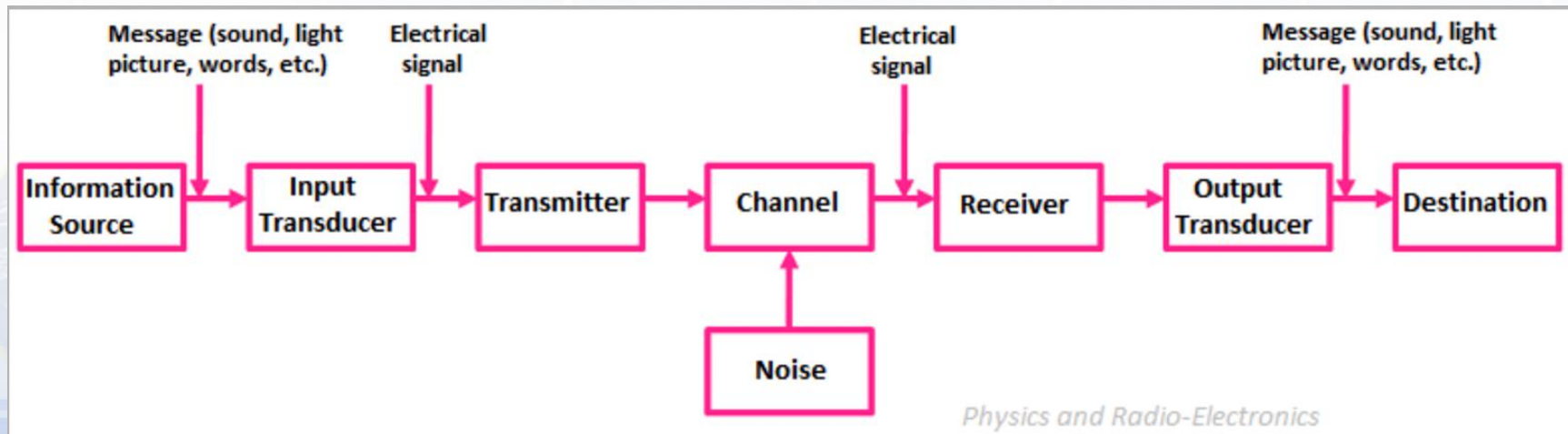
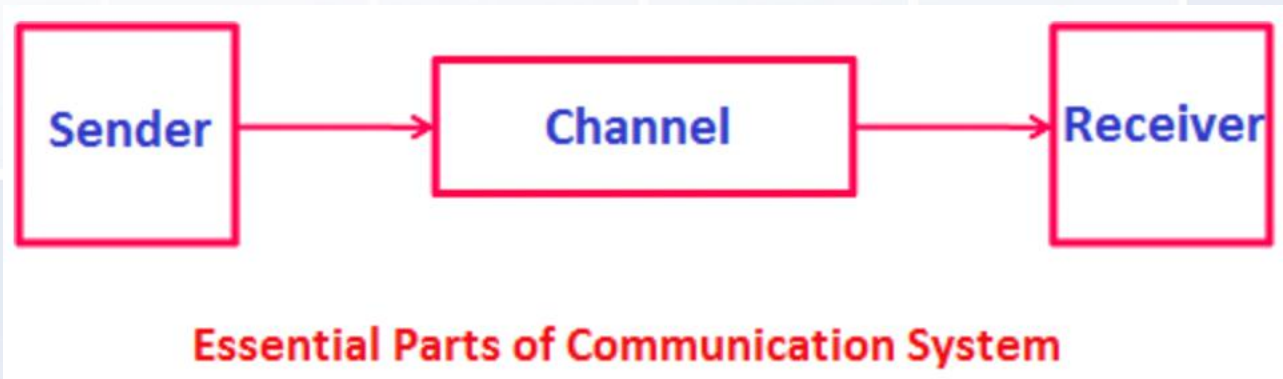
Frequencies for radio transmission

Tugas Mandiri

# Elements of a Communication System

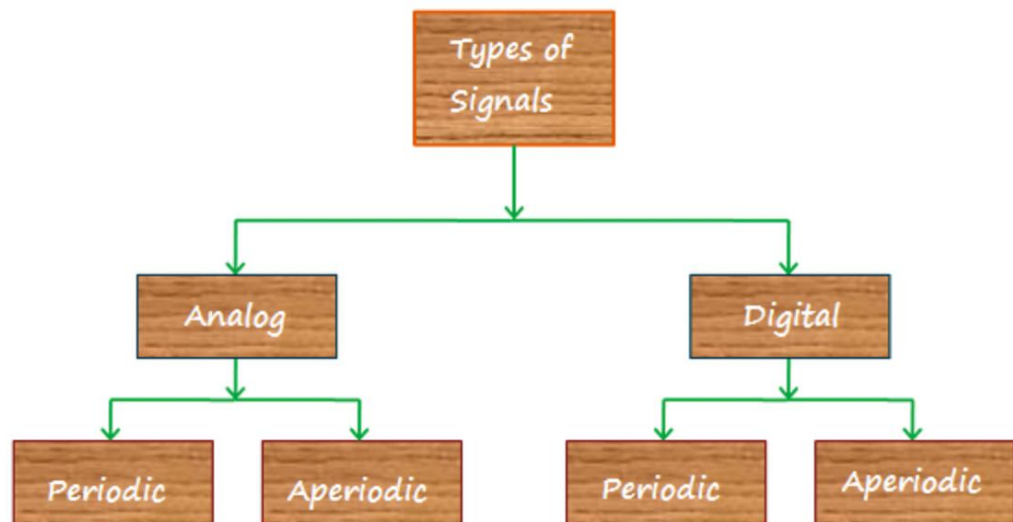
Communication means sending, receiving and processing of information between two or more devices. A collection of elements (devices) which works together to establish a communication between the sender and receiver is called a communication system. Some examples of communication system include radio broadcasting, television broadcasting, radio telegraphy, mobile communication, computer communication etc.

# Elements of a Communication System



# Types of Signals

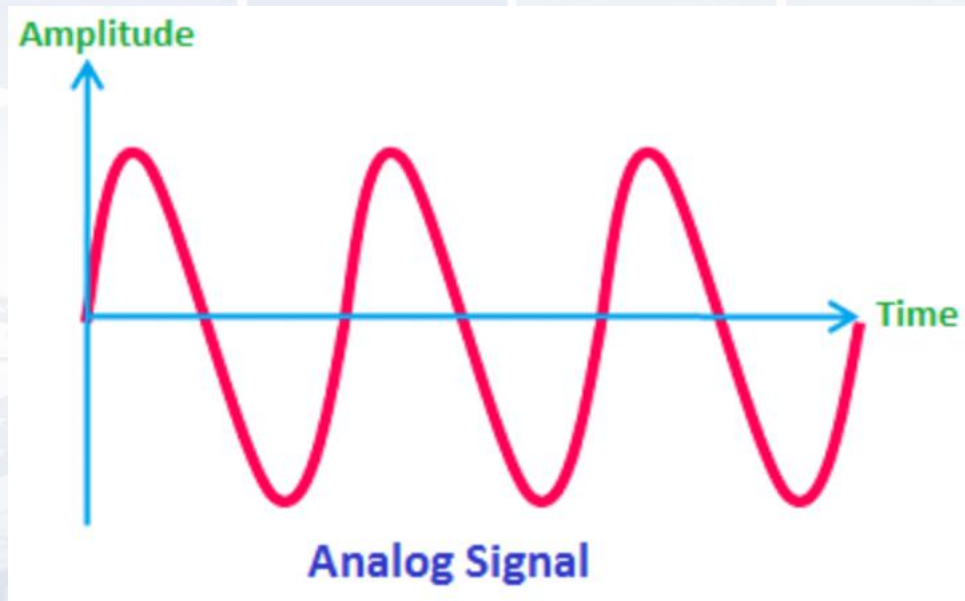
Signals are classified into various types based on their characteristics. However, they are mainly classified into two types: Analog signals and Digital signals.



**Types of Signals**

# Analog signal

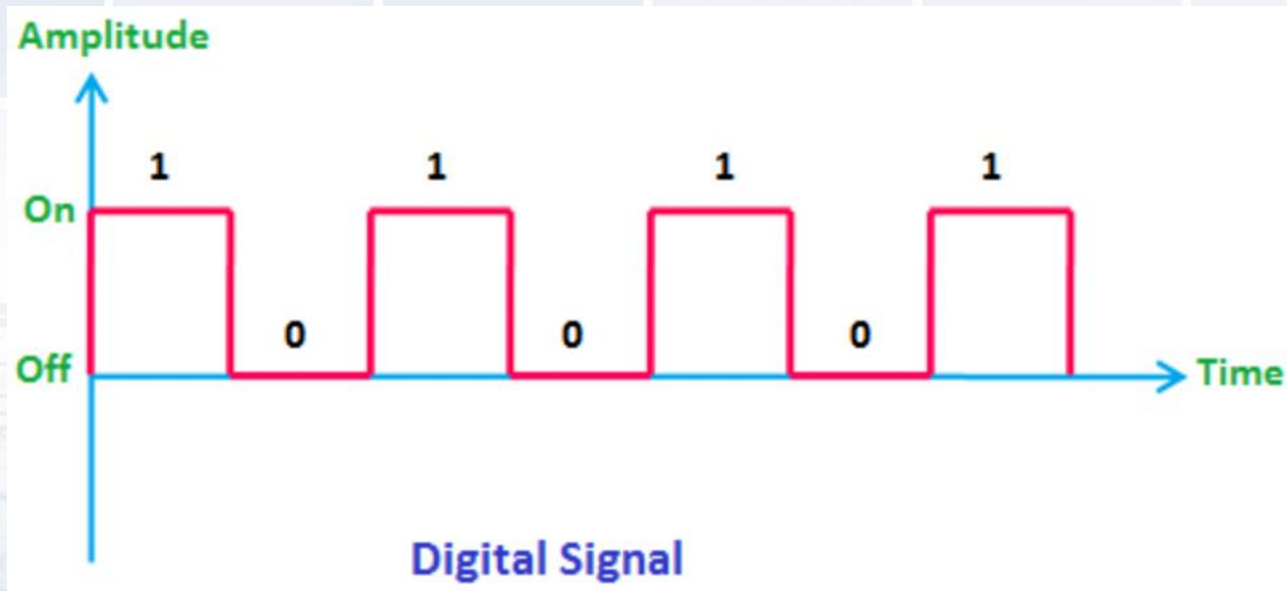
Analog signal is a continuous signal whose characteristics (amplitude, voltage or frequency) changes continuously over a period of time.



## Chapter 1

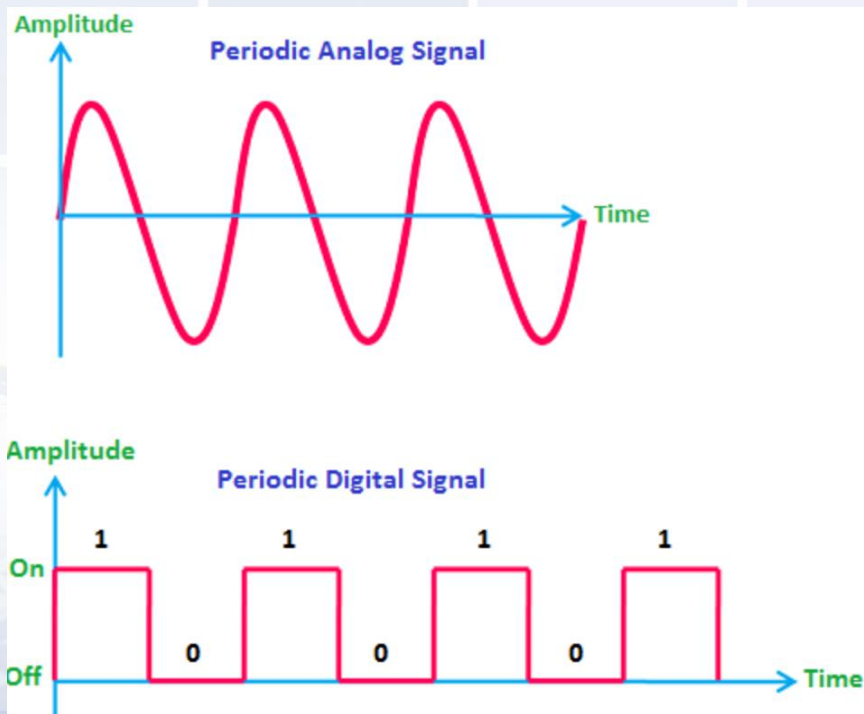
# Digital signal

Digital signal is a non-continuous electrical signal, which is used to convey (send, receive, and process) information between the sender and receiver.



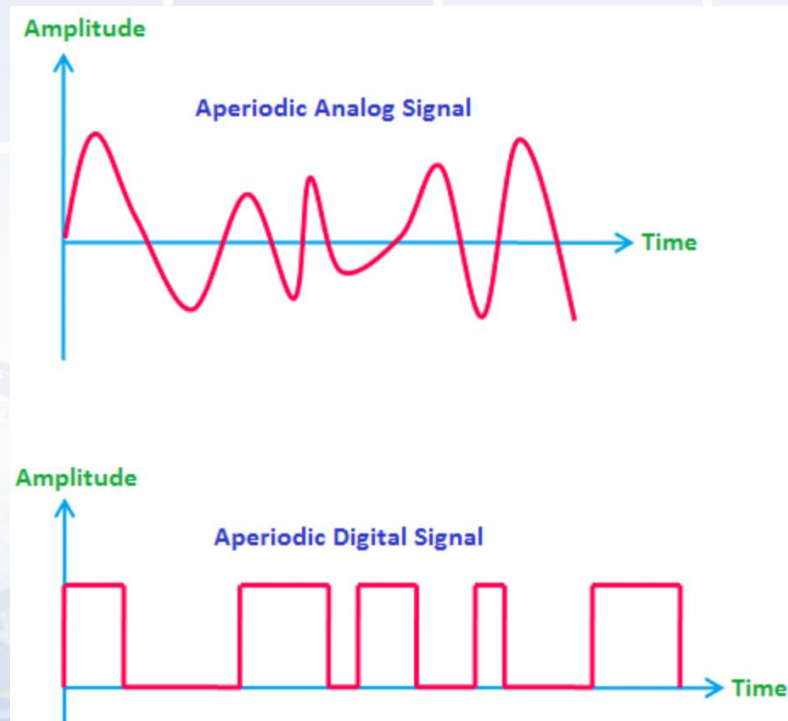
# Periodic signal

An analog or digital signal which repeats itself after a specific interval of time is called periodic signal. They are deterministic signals.



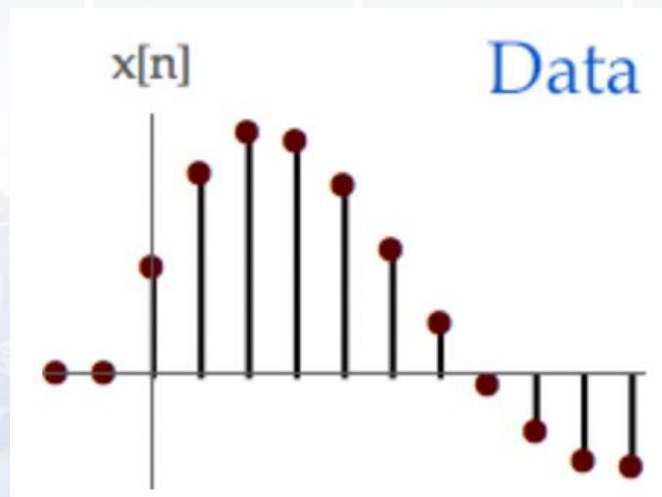
# Aperiodic signal

An analog or digital signal which does not repeat itself after a specific interval of time is called aperiodic signal. They are random signals.



# Discrete signal

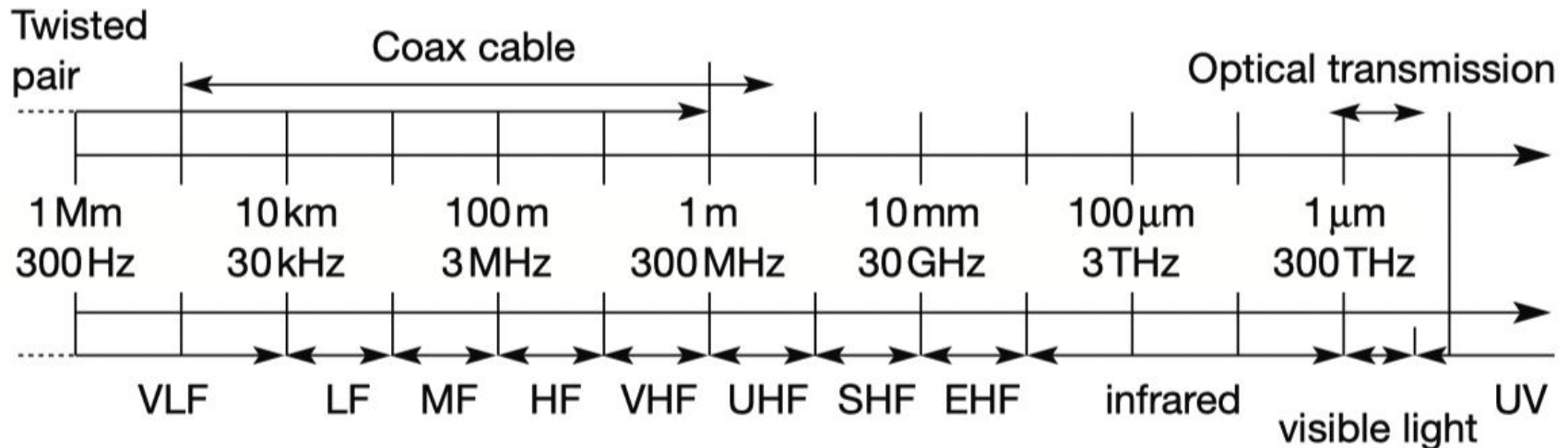
A discrete-time signal is a sequence of values that correspond to particular instants in time. The time instants at which the signal is defined are the signal's sample times, and the associated signal values are the signal's samples.



## Chapter 1

# Frequencies for radio transmission

Radio transmission can take place using many different frequency bands. Each frequency band exhibits certain advantages and disadvantages.



## Chapter 1

# Frequencies for radio transmission

	<b>Europe</b>	<b>US</b>	<b>Japan</b>
<b>Mobile phones</b>	<b>NMT</b>  453–457 463–467  <b>GSM</b>  890–915 935–960 1710–1785 1805–1880  <b>UMTS (FDD)/ W-CDMA</b> 1920–1980 2110–2190	<b>AMPS, TDMA, CDMA</b>  824–849 869–894  <b>GSM, TDMA, CDMA</b>  1850–1910 1930–1990	<b>PDC</b>  810–826 940–956 1429–1465 1477–1513  <b>FOMA/ W-CDMA</b> 1920–1980 2110–2170

## Chapter 1

<b>Cordless telephones</b>	<b>UMTS (TDD)</b> 1900–1920 2020–2025		
	<b>CT1+</b> 885–887 930–932	<b>PACS</b> 1850–1910 1930–1990	<b>PHS</b> 1895–1918
	<b>CT2</b> 864–868	<b>PACS-UB</b> 1910–1930	<b>JCT</b> 254–380
	<b>DECT</b> 1880–1900		
<b>Wireless LANs</b>	<b>IEEE 802.11</b> 2400–2483	<b>IEEE 802.11</b> 902–928 2400–2483	<b>IEEE 802.11</b> 2400–2497
	<b>HiperLAN2, IEEE 802.11a</b> 5150–5350 5470–5725	<b>HiperLAN2, IEEE 802.11a</b> 5150–5350 5725–5825	<b>HiperLAN2, IEEE 802.11a</b> 5150–5250
<b>Others</b>	<b>RF-Control</b> 27, 128, 418, 433, 868	<b>RF-Control</b> 315, 915	<b>RF-Control</b> 426, 868
	<b>Satellite (e.g., Iridium, Globalstar)</b> 1610–1626, 2483–2500		

## Tugas Mandiri (teori):

1. Berikan contoh penerapan dari berbagai jenis-jenis signal di keseharian.
2. Di frekuensi berapakah gelombang radio dari Wifi, Smartphone, Bluetooth, jelaskan kelebihan dan kekurangannya.

## Tugas Mandiri (praktikum):

Rakit komponen sederhana dan gunakan oscilloscope untuk menampilkan jenis-jenis signal.

end

