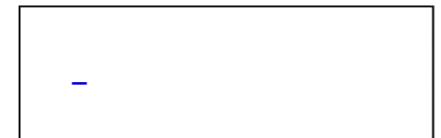
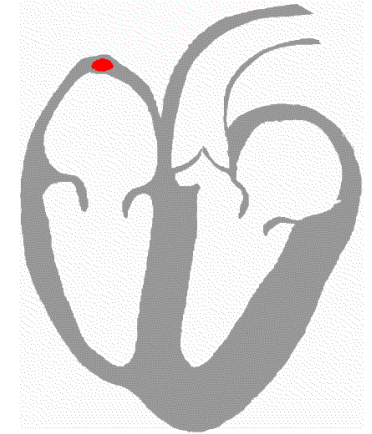


# BME 311

## Biomedical Instrumentation I



### 01 - Introduction



Faculty of Engineering

Department of Biomedical Engineering

Dr. Mehmet Yüksekaya

# What is Biomedical Instrumentation?



- Biomedical Instruments
  - Biomedical Instruments are devices that measure, evaluate and/or treat biological systems.

# Biomedical Instrumentation I & II

## Contents

---



1. Introduction to biomedical instrumentation.
2. Measurement and signals.
3. Physiological data and biopotentials.
4. Electrodes, transducers and sensors.
5. Bioelectric amplifiers and interfaces.
6. Bioinstrumentation systems and their principles
  - ECG, EEG, EMG ....
  - Blood pressure,
  - Respiratory analysis,
  - Medical care units.

# Course Syllabus



## Week

1. Introduction to biomedical instrumentation, Biosignals
2. Biopotentials, Electrodes
3. Bioelectric Amplifiers
4. Instrumentation Amplifiers
5. Filters
6. Rest of the electronics for biopotential acquisition
7. ECG
8. MIDTERM EXAM
9. EEG
10. EMG
11. EDA-GSR
12. EOG
13. ERG
14. EGG

# Laboratory Work



1. ELECTROMYOGRAPHY (EMG) I
2. ELECTROMYOGRAPHY (EMG) II
3. ELECTROENCEPHALOGRAPHY (EEG) I
4. ELECTROENCEPHALOGRAPHY (EEG) II
5. ELECTROCARDIOGRAPHY (ECG) I
6. ELECTROCARDIOGRAPHY (ECG) II
7. ECG & PULSE
8. RESPIRATORY CYCLE I
9. ELECTRODERMAL ACTIVITY & POLYGRAPH
10. ELECTROOCULOGRAM (EOG) I

# Course Materials



## Textbook

Introduction to Biomedical Equipment Technology, Fourth Edition, Joseph J. Carr, Prentice Hall (2000)

## Reference book

Medical Instrumentation: Application and Design, Fourth Edition, John G. Webster, John Wiley & Sons, Inc. (2009)

Introduction to  
Biomedical Equipment  
Technology  
Fourth Edition



Joseph J. Carr  
John M. Brown

# Medical Device Market Turkey



- Turkish medical devices sector include:
- Turkish medical devices market is USD 2.3 billion in 2016.
- There are approximately 1,000 medical device manufacturers in Turkey. There are also medical device clusters in Istanbul, Ankara, and Samsun provinces.
- The market is expected to grow by 6.7 percent in TRY terms annually between 2016-2020
- 29 new healthcare campus projects with a total bed capacity of 41,000 will cater to increasing demand in the sector over the next several years.
- The growing medical tourism sector, in which the number of tourists rose from 74,000 in 2008 to almost 1 million in 2016, is expected to further stimulate demand for medical devices.
- Medical device regulations are in line with EU directives.

# Biomedical Instrumentation

