



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Physics For Biological Systems II							
Course Code		FİZ338		Couse Level		First Cycle (Bachelor's Degree)			
ECTS Credit	6	Workload	151 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		It is aimed to learn the properties of various signals recorded from biological systems and sensory biophysics.							
Course Content		What is a signal?; Physiological signal types; Biophysical bases of electroencephalography; Transmission, contraction of skeletal muscle and basic principles of electromyography; Bioelectrical events in heart and basic principles of electrocardiography; Bioelectrical measurement and observation devices; Circulatory system dynamics and fluids; Visual biophysics; Biophysics of hearing and acoustic.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Individual Study					
Name of Lecturer(s)		Lec. Şerife Gökçe ÇALIŞKAN							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	70

Recommended or Required Reading

1	Biyoloji ve Tıpta Fizik, Paul Davidovits, Nobel Akademik Yayıncılık, Ankara, 2011.
2	Biyofizik, Ferit Pehlivan, Pelikan Yayınevi, Ankara, 2017.
3	Biyofizik, Gürbüz Çelebi, Fakülteler Yayınevi, İzmir, 2000

Week	Weekly Detailed Course Contents	
1	Theoretical	What is a signal?
2	Theoretical	Physiological signal types
3	Theoretical	Biophysical bases of electroencephalography
4	Theoretical	Transmission, contraction of skeletal muscle and basic principles of electromyography
5	Theoretical	Bioelectrical events in heart and basic principles of electrocardiography
6	Theoretical	Bioelectrical measurement and observation devices
7	Theoretical	Bioelectrical measurement and observation devices
8	Theoretical	Circulatory system Dynamics and fluids
9	Intermediate Exam	Midterm Exam
10	Theoretical	Circulatory system Dynamics and fluids
11	Theoretical	Visual biophysics
12	Theoretical	Visual biophysics
13	Theoretical	Biophysics of hearing and acoustic
14	Theoretical	Biophysics of hearing and acoustic
15	Theoretical	Biophysics of hearing and acoustic

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	3	70
Quiz	10	3	1	40
Midterm Examination	1	18	1.5	19.5
Final Examination	1	20	1.5	21.5
Total Workload (Hours)				151
[Total Workload (Hours) / 25*] = ECTS				6

*25 hour workload is accepted as 1 ECTS



Learning Outcomes

1	Learning how to obtain the signals and what it is
2	Having knowledge about various physiological signals
3	Having knowledge about measurement and observation devices used in biophysics
4	Having knowledge about the relationship between circulatory system dynamics and fluids
5	Investigating physics for various sensory systems

Programme Outcomes (Physics)

1	To understand the importance of physics by understanding the general concepts of physics, matter and energy
2	To be able to define the movements of matter and to distinguish the characteristics of movements under different force (potential)
3	Be able to say the meaning of Lagrange and Hamiltonian formulations of the movement and apply them to simple problems,
4	To be able to express the fundamental concepts such as time, space, force, momentum and energy in the movements of matter close to the speed of light and be able to solve and interpret the simple problems related to
5	To be able to establish the relationship between electric and magnetic forces and to be able to illustrate their applications to technology and solve problems related to the movement of particles in electric and magnetic fields
6	Be able to say the basic laws of electromagnetics and apply them to problems, illustrate their applications to simple technology
7	To be able to tell the reasons of the differences between the classical cases and the quantum scale and explain the reasons
8	Explain the concepts of discontinuity, uncertainty, matter-antimatter, indecisiveness of quantum physics with examples and explain simple problems related to the subject.
9	To be able to solve the problems of micro-particles under different simple potentials and be able to say their meanings
10	To be able to establish the relationship between the movements and properties of multi-particle systems and the laws of probability and solve simple problems
11	To be able to illustrate the laws, meanings and applications of thermodynamics and use them
12	Be able to use their knowledge about quantum physics and mechanics in explaining some properties of atoms and nuclei
13	To be able to show the meanings of some theoretical concepts by experimenting, and develop a strong relationship between thought and the real world, develop analytical thinking
14	To be able to apply the meanings of the basic laws of physics, their comprehension of universality and the relations between them and the unity of the laws of nature.
15	Use computer to solve physics problems
16	To be able to understand the problems by using their analytical knowledge skills and to propose solutions by dealing with the laws of physics
17	Be able to use the knowledge of physics to understand new technologies
18	To be able to tell the relations between symmetry and conservation laws in laws of physics

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	4	5	5	5	4
P2	5	5	4	5	5
P3	4	4	5	5	4
P4	4	3	3	3	3
P5	2	2	2	2	2
P6	4	4	4	4	4
P7	2	5	3	3	4
P8	2	4	2	2	3

