



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Physics For Biological Systems I							
Course Code		FİZ337		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	6	Workload	146 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		It is aimed to make a connection between physical concepts and biological systems.							
Course Content		What is biophysics?; Basic concepts of molecular biophysics; Livings as an open system; Energy conversions in biological systems; Basic concepts and laws of thermodynamics; Energy transfer of biological systems; Biophysical events in cell; Electrical properties of cells and action potential; Synaptic transmission.							
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 biophysics?
2	Theoretical	Basic concepts of molecular biophysics
3	Theoretical	Livings as an open system
4	Theoretical	Energy conversions in biological systems
5	Theoretical	Basic concepts and laws of thermodynamics
6	Theoretical	Energy transfer of biological systems
7	Theoretical	Energy transfer of biological systems
8	Intermediate Exam	midterm
9	Theoretical	Biophysical events in cell
10	Theoretical	Biophysical events in cell
11	Theoretical	Electrical properties of cells and action potential
12	Theoretical	Electrical properties of cells and action potential
13	Theoretical	Synaptic transmission
14	Theoretical	Synaptic transmission
15	Theoretical	Synaptic transmission

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	5	2	2	20
Quiz	2	1	1	4
Midterm Examination	1	14	3	17
Final Examination	1	18	3	21
Total Workload (Hours)				146
[Total Workload (Hours) / 25*] = ECTS				6

*25 hour workload is accepted as 1 ECTS



Learning Outcomes

1	Learning that every change and development in living systems can be explained by only physics laws.
2	Having knowledge about energy transfer and its types in living systems,
3	Learning the biophysical properties of events occurring in the cell
4	Having knowledge about biopotentials, membrane and action potentials
5	5. Having knowledge about intercellular transmission

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	5	3
P5	2	2	2	4	2
P6	4	4	4	4	4
P7	2	5	3	3	4
P8	2	4	2	2	3

