



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Waves in Physics and Applications of Them							
Course Code		FİZ236		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	6	Workload	150 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The investigation of the features of water, sound and light waves and the importance of waves in physics representation and formulation of them							
Course Content		The differences and similarities of vibrations and waves, wave equations, sound, light and probability waves							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	70
Quiz	2	10
Assignment	1	10

Recommended or Required Reading

1	Dalgalar (Berkeley Fizik Serisi 3), S.C.F.Crawford, Ankara Üniversitesi, Bilim Yayınları
2	Fen ve Müh için Fizik II, R.A.Serway, R.B.Beicher
3	Titreşim ve Dalgalar ve Problemler, Güneş Tanır, Palme Yayıncılık
4	Physics2000 sitesi, http:// www.colorado.edu/physics/2000/

Week	Weekly Detailed Course Contents	
1	Theoretical	The comparison of vibration and wave motions
2	Theoretical	Reaching the wave equation and comparison of it with Newton equation
3	Theoretical	The investigation of how the speed of wave depends on the medium
4	Theoretical	The solutions and the investigation the simple results of wave equation
5	Theoretical	Sound wave equation and investigation of sound wave
6	Theoretical	The propagation of sound wave and speed of sound
7	Theoretical	The propagation of sound wave, refraction and reflection of it
8	Intermediate Exam	Midterm
9	Theoretical	The investigation of Maxwell's equations
10	Theoretical	Showing the fact that Maxwell's equations represent a wave equation
11	Theoretical	The investigation of electromagnetic equation and features of it
12	Theoretical	Simple model of light-matter interaction
13	Theoretical	The investigation of the propagation, speed and the energy of light
14	Theoretical	The investigation of reflection and refraction of light wave
15	Theoretical	The comparison of electromagnetic wave and Schrödinger Wave equation

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	1	5	1	6
Quiz	2	5	0.5	11
Midterm Examination	1	15	2	17



Final Examination	1	30	2	32
Total Workload (Hours)				150
[Total Workload (Hours) / 25*] = ECTS				6
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	Must represent the difference between the wave motion and the other types of motions
2	Must write the wave equation and represent why the wave equation's being a special motion equation
3	Must write the solutions of wave equations and say the meaning of it
4	Must say the fact that the waves carry energy and their features change with respect to the medium that propagate through
5	Must write the wave equation of a string and represent the terms insight it
6	Must write the equation of water waves and represent the features of them
7	Must write the electromagnetic wave equation and represent the basic concepts related to propagation of light

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
P1	4	
P2		4

