



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Vibrations and Waves							
Course Code		FİZ202		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	7	Workload	169 (<i>Hours</i>)	Theory	4	Practice	0	Laboratory	0
Objectives of the Course		To investigate the behavior of harmonic oscillator under the different conditions, as a result of this, to investigate the effect on the behavior of the wave and the results which is obtained should be apply different system.							
Course Content		Periodic motion, oscillations, harmonic oscillators							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion					
Name of Lecturer(s)		Lec. Şerife Gökçe ÇALIŞKAN							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	70
Quiz	6	10
Assignment	6	10

Recommended or Required Reading

1	Titreşim ve Dalgalar, A. P. French, Aktif Yayınevi, 1996.
2	Schaum's outlines, Mechanical Vibrations, S. Graham Kelly, McGraw-Hill, 1996.
3	Waves (Berkeley physics course, Frank S. Crawford)

Week	Weekly Detailed Course Contents	
1	Theoretical	Definition of basic Concepts
2	Theoretical	Work and Energy theorem and Potential energy
3	Theoretical	Periodic motion and applications
4	Theoretical	Superposition of periodic motion
5	Theoretical	Free oscillation of physical systems
6	Theoretical	Forced oscillation
7	Theoretical	Resonances in system
8	Intermediate Exam	Midterm
9	Theoretical	Couple harmonic oscillator
10	Theoretical	Normal Modes
11	Theoretical	Normal modes of continuous systems
12	Theoretical	Traveling waves
13	Theoretical	Wave equations and importance of these in Physics
14	Theoretical	Dispersion relation
15	Theoretical	The concepts of group and Phase velocity

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	15	3	3	90
Assignment	6	3	3	36
Quiz	6	3	1	24
Midterm Examination	1	5	3	8



Final Examination	1	8	3	11
Total Workload (Hours)				169
[Total Workload (Hours) / 25*] = ECTS				7
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	The concept of conservative force and work-energy theorem can be figured out.
2	Newton's three laws can be easily applied
3	The fundamental concepts of waves such as wavelength and frequency should be known
4	Transverse and longitudinal waves should be comprehended.
5	The difference between standing and traveling waves should be comprehended.
6	The harmonic oscillator model that is very importance for physics can be learned.
7	When they hear the word of harmonic motion, many models can be occurred.
8	The effects of net force acting on harmonic attitude of system can be visualized.
9	Simple harmonic motion as being due to a restoring force that is directly proportional and opposite to the displacement of an object from an equilibrium position can be defined.
10	Be able to solve that the mystery of wave equations.

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	L6	L7	L8	L9	L10
P1	4	1	5	5	5	1	1	1	1	1
P13						5	5	5	5	5
P14	3	3	1			4	4	4	4	4
P16	4	4	1			5	5	5	5	5
P17						1	1	3	1	1
P18	5	5	1							

