



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Modern Physics							
Course Code		FİZ201		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	7	Workload	172 (Hours)	Theory	4	Practice	0	Laboratory	0
Objectives of the Course		Providing knowledge on the basic aspects of modern physics by comparing the results of special relativity and quantum with classical theory.							
Course Content		Special relativity, black body radiation, photoelectric effect, X ray and the properties of X ray spectrum, Compton effect, diffraction of waves, diffraction of particles, quantum theory, quantum mechanics, structure of the atom, structure and dimension of the nucleus, Bohr's atomic model, Sommerfeld's model and quantum numbers							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Problem Solving					
Name of Lecturer(s)		Assoc. Prof. Melis GÖKÇE							

Assessment Methods and Criteria

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

Recommended or Required Reading

1	1. Physics for Scientists and Engineer, Raymond Serway.
2	2. Concepts of Modern Physics, 1997, Arthur Beiser.
3	Modern Physics: J. Taylor ve C. Zafiratos.

Week	Weekly Detailed Course Contents	
1	Theoretical	Special Relativity
2	Theoretical	Special Relativity
3	Theoretical	Special Relativity
4	Theoretical	Particle Properties of Waves
5	Theoretical	Particle Properties of Waves
6	Theoretical	Particle Properties of Waves
7	Intermediate Exam	Midterm Exam
8	Theoretical	Wave Properties of Particles
9	Theoretical	Wave Properties of Particles
10	Theoretical	Wave Properties of Particles
11	Theoretical	Atomic Structure
12	Theoretical	Atomic Structure
13	Theoretical	Atomic Structure
14	Theoretical	Introduction to Quantum Mechanics
15	Theoretical	Introduction to Quantum Mechanics

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	15	5	4	135
Quiz	2	4	0.5	9
Midterm Examination	1	14	2	16
Final Examination	1	10	2	12
Total Workload (Hours)				172
[Total Workload (Hours) / 25*] = ECTS				7

*25 hour workload is accepted as 1 ECTS



Learning Outcomes

1	Ability to learn the phenomenon that the classical physics is inadequate to explain.
2	Ability to learn the relativity theory.
3	Ability to comprehensive the wave-particle nature.
4	Ability to comprehensive the basic concepts of quantum theory and the reasons of the requirement for them.
5	Ability to learn the basic concepts of quantum mechanics.

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				
P4		5	4		
P7	5	5	3	4	4
P8	4			4	4
P12				3	4

