AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Applications and Evolution of Modern Physics								
Course Code	FİZ217		Couse Level	First Cycle (Bachelor's Degree)					
ECTS Credit	4	Workload	105 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The investigation of quantum physics, relativistic physics and statistical physics which have been developed since 1900s when the phenomenon's arise which cannot be explained by classical physics								
Course Content	The features of classical physics, the features of quantum mechanics and its applications, the features of relativity and its applications, statistical physics and probability, applications of statistical physics								
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	60
Quiz	2	10
Assignment	1	10

Recommended or Required Reading	
1	Modern Fiziğin Kavramları, Arthur Bieser
2	Fen ve Müh için Fizik III,R.A.Serway,R.B.Beicher,Palme Yayınclık
3	Modern Fizik,J.R.Taylor,ARTE/GÜVEN Yayıncılık

Week	Weekly Detailed Course Contents	
1	Theoretical	Classical Physics: (Newton, Lagrange, Hamilton dynamics)
2	Theoretical	Classical physics: Electricity and magnetisms Maxwell's equations
3	Theoretical	Classical physics: Thermodynamics
4	Theoretical	Experiments: Photoelectric effect, Michelson-Morley, double creation and black body radiation
5	Theoretical	Planck and the discovery of quantization energy values
6	Theoretical	The features of quantum physics
7	Theoretical	Relativistic physics; The discovery of the fact that the space and the time are not absolute
8	Intermediate Exam	Midterm
9	Theoretical	The application of quantum physics on atoms
10	Theoretical	The application of quantum physics on nucleii
11	Theoretical	Quantum and relativistic physics
12	Theoretical	Statistical physics and probability
13	Theoretical	Thermal capacitance of matters
14	Theoretical	Quantum statistical physics
15	Theoretical	Physics, probability and determinism, causality

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	3	56
Assignment	1	6	1	7
Quiz	2	5	0.5	11
Midterm Examination	1	9	2	11

Final Examination	1	18	2	20
			Total Workload (Hours)	105
			[Total Workload (Hours) / 25*] = **ECTS**	4
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	Must represent the features of classical physics and define it
2	Must explain the efficiencies of classical physics with both theoretical and experimental results
3	Must say the basic experiments that raise the modern physics and must explain why the modern physics is needed
4	Must say the difference of quantum physics and relativistic physics from classical physics
5	Must say the relation of physics with probability concept and why statistical physics has arisen
6	Must say the application of quantum, relativistic and statistical physics nowadays

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
P1	4		4	4		
P2	4	4	4	4	4	
P3	4	4		4	4	
P7			4	4	4	
P8			4	4	4	
P9			4		4	
P10						4
P11	4	4	4	4		4
P12			4			
P13	4	4			4	
P15		4		4		
P16						4
P17	4	3		4	4	4
P18				4	4	4