



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Wave Optics							
Course Code		FİZ330		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		To explain the properties of light as an electromagnetic wave and applications of these in nature							
Course Content		Maxwell equations, radiation, light polarization, refraction							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion					
Name of Lecturer(s)		Prof. Hüseyin DERİN							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	70
Quiz	2	10

Recommended or Required Reading

1	Fundamentals of Optics, Francis Jenkins and Harvey White, Volume I, 2001
2	Optics, Hecht, E., and A. Zajac, 2nd Edition. Reading, Massachusetts: Addison Wesley, Publishing Company, 1987.

Week	Weekly Detailed Course Contents	
1	Theoretical	To derive Maxwell equations and wave equation of light and use these for investigating the features of light
2	Theoretical	To explain light features as a 1, 2 and 3 dim wave and solve wave equation for boundary conditions and explain light propagation
3	Theoretical	To present how occurs the radiation emitted from an accelerating point particle and calculate its power
4	Theoretical	To define polarization of light and say features of polarized states
5	Theoretical	Must explain polarized transverse light waves' obtaining
6	Theoretical	To say the meanings of double refraction of light, band width, coherence time
7	Theoretical	To show the interference of two correlated point light source mathematically and define the features of it
8	Intermediate Exam	Midterm
9	Theoretical	To present the interference of light coming from two independent sources
10	Theoretical	To say the angular width of radiation propagating as a wave and explain its reason
11	Theoretical	Diffraction and Huygens principle
13	Theoretical	The investigation of electromagnetic waves propagating through matter
14	Theoretical	Why is the sky blue?
15	Theoretical	Electromagnetic radiation of 1 dimensional atom

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	2	84
Quiz	2	5	1	12
Midterm Examination	1	20	2	22
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	1. Must write Maxwell equations and wave equation of light and use these for investigating light's features
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2	Must explain light features as a 1, 2 and 3 dim wave and solve wave equation for boundary conditions and explain light propagation
3	Must present how occurs the radiation emitted from an accelerating point particle and calculate its power
4	Must define polarization of light and say features of polarized states
5	Must explain polarized transverse light waves' obtaining
6	Must say the meanings of double refraction of light, band width, coherence time
7	Must show the interference of two correlated point light source mathematically and define the features of it
8	Must present the interference of light coming from two independent sources
9	Must say the angular width of radiation propagating as a wave and explain its reason

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
P1	4					4	3		
P2			4	4		4	5	4	
P4			4						4
P5								4	
P6								4	
P7									4
P11								4	
P12									4
P13					4		4		
P14		4			4				
P16								4	
P17	4	3						4	
P18									4

