ACOUSTICS AND OPTICS

1	Course Title:	ACOUSTICS AND OPTICS
2	Course Code:	FZK3001
3	Type of Course:	Compulsory
4	Level of Course:	First Cycle
5	Year of Study:	3
6	Semester:	5
7	ECTS Credits Allocated:	6.00
8	Theoretical (hour/week):	4.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	FZK 2002 Waves Course to be taken
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. AHMET CENGİZ
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	Prof. Dr. Ahmet Cengiz B. U. Ü. Fen-Edebiyat Fakültesi Fizik Bölümü 16059 Görükle Bursa email: acengiz@uludag.edu.tr
17	Website:	
18	Objective of the Course:	To enhance the understanding on the basic concepts of vibrations and waves and to establish the relationship between them. In connection therewith, to explain the events such as light and sound with waves.
19	Contribution of the Course to Professional Development:	Understanding the physics of Acoustic and Optical events.
20	Learning Outcomes:	
	1	Learns waves, pulses and wave packets.
	2	Learns spread of waves, the group and phase velocity.
	3	Makes Fourier analysis of pulses and traveling wave packets
	4	Learns of harmonic plane waves the propagation vector.
	5	Understands the properties of water waves and electromagnetic waves.
	6	Learns how an information is transferred using the waves.
	7	Understands the polarization of the light, different polarizations and production of the polarized waves.
	8	Learns the interference and diffraction of the waves.
	9	Learns Huygens' Principle.
	10	Learns the properties of optical instruments.
21	Course Content:	

Course Content:

Week	Theoretical	Practice
1	Modulation, Pulses and Wave Packets 1.Group velocity, Phase velocity 2.Pulses	
2	3.Fourier Analysis of Pulses	

3	4.Fourier Analysis of traveling wave Packet	
4	Waves in Two and Three Dimensions 1.Harmonic Plane Waves and Propagation Vector	
5	2.Water Waves	
6	3.Electromagnetic Waves I. Midterm exam	
7	4.Radiation from a Point Charge and Calculation of Emitted Transverse (Perpendicular) Fields	
8	Polarization 1.Description of Polarization States	
9	2.Production of Polarized Transverse Waves 3.Double Refraction	
10	4.Bandwith, Coherence Time and Polarization	
11	Interference and Diffraction 1.Interference between Two Coherent Point Sources 2.Interference between Two Independent Sources II. Midterm exam	
12	3.How Large Can a Point Light Source Be? 4.Angular Width of a Beam Traveling Waves. Diffraction	
13	5.Diffraction and Huygens' Principle	
14	6.Geometrical Optics	

Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical		14	4.00	56.00
Practicals/Labs		0	0.00	0.00
Self-study and preperation		14	3.00	42.00
Homeworks		14	3.00	42.00
Projects		0	0.00	0.00
Midterm Exam	2	40.00		
Field Studies		0	0.00	0.00
Midterm exams		2	2.00	4.00
Home work-project	0	0.00		
Others		14	2.00	28.00
Final Exams		1	2.00	2.00
Total	3	100.00		
Total Work Load				178.00
Total work load / 30 hr				5.80
ECTS Credit of the Course				6.00

Total	100.00
Measurement and Evaluation Techniques Used in the Course	The system of relative evaluation is applied.

23 Assessment

2. E. S. CRAWFORD, JR., Waves (Berkeley physics course-volume 3), Mcgraw-Hill, 1968.

24 **ECTS / WORK LOAD TABLE**

25 **CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS**

	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK2	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0

ÖK3	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK4	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK5	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK6	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK7	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK8	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK9	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK10	5	5	4	0	0	4	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**