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:	Prof. Dr. Naim DERABAŞI
16	Contact information of the Course Coordinator:	acengiz@uludag.edu.tr, 0 224 29 41695, U. Ü. Fen Edebiyat Fakültesi, Fizik Bölümü 16059 Görükle Bursa.
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:	
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	

22	Textbooks, References and/or Other Materials:	1. A. CENGİZ, Lecture Notes on Acoustic and Optics; 2. F. S. CRAWFORD, JR., Waves (Berkeley physics course-volume 3), Mcgraw-Hill, 1968.
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	2	50.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	50.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade		50.00
Contribution of Final Exam to Success Grade		50.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24	**ECTS / WORK LOAD TABLE**

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
Field Studies	0	0.00	0.00
Midterm exams	2	2.00	4.00
Others	14	2.00	28.00
Final Exams	1	2.00	2.00
Total Work Load			174.00
Total work load/ 30 hr			5.80
ECTS Credit of the Course			6.00

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**				