

MM 456 Acoustics and Noise Control				DEPARTMENT OF MECHANICAL ENGINEERING					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project / Field Study	Homework	Other	Total	Credit	ECTS Credit
8	42	0	-		20	13	75	3	3.0
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	None								
Course Contents	Wave motion, wave equation and its solutions. Acoustic intensity and acoustic impedance. Sound reflection, transmission and transmission loss. Sound perception and noise. Mechanism of hearing. Measurement of noise. Basic principles of noise control. Noise source identification, noise control at the source, at the path and at the receiver. Vibrations and noise.								
Course Objectives	To introduce basic properties and importance of acoustics and noise control in engineering applications. To teach and apply basic methods employed for analysis of engineering problems involving noise and how to control its level.								
Learning Outcomes and Competences	Understanding of basic properties of acoustics and noise. Learning the methods used for analysis of noise which is an indispensable phenomena in physical systems. Learning of adverse effects caused by noise and importance of its control in mechanical systems. Learning the techniques used in control or reduction of noise levels. Having awareness of the environmental effects of noise.								
Textbook and /or Reference	Acoustics and Noise Control, B.J. Smith, R.J. Peters, S. Owen, Longman, U.K. Engineering Noise Control, D.A. Bies, C.H. Hansen, Unwin, U.K. Endüstriyel Gürültü Kontrolü, N. Özgüven, MMO Yayını, Ankara (in Turkish).								
Assessment Criteria						If any, mark as (x)		Percentage (%)	
	Midterm Exams					X		50	
	Quizzes								
	Homeworks					X		10	
	Projects								
	Term Paper								
	Laboratory Work					X			
	Other								
Final Exam					X		40		
Instructors	Prof. Nizami AKTURK								
Week	Subject								
1	INTRODUCTION: A brief history of acoustics, importance of the study of acoustic, basic concepts of acoustics, the acoustic field variables and wave equation, plane and spherical waves.								
2	BASIC CONCEPTS: Units, spectra, wave, combining sound pressure levels, hearing, brief description of the ear, subjective response to sound pressure level, pitch, masking, intelligibility, effect of noise on human.								
3	NOISE MEASUREMENT: Microphones, weighting networks, sound level meters, grades of the sound level meters, calibration, sound measurement, time varying sound, environmental noise measurement.								
4	ACOUSTIC PLANE WAVES: Elastic behavior of fluids, plane wave equation, harmonic solution of the plane wave equation, energy density of plane waves, sound speed in different environments.								
5	ACOUSTIC PLANE WAVES: Acoustic intensity, specific acoustic impedance, acoustic standards and reference conditions, decibel scales.								
6	TRANSMISSION PHENOMENA: Changes in media, transmission from one field medium to another: normal incidence, reflection at the surface of a solid: normal incidence, standing wave patterns.								
7	TRANSMISSION PHENOMENA: Transmission through three media: normal incidence, transmission loss for solid wall materials.								
8	MIDTERM 1: Examination, solution of questions, Experiment 1.								
9	OBLIQUE TRANSMISSION: Transmission from one fluid medium to another: oblique incidence, reflection at the surface of a solid: oblique incidence, spherical acoustic waves: an introduction.								
10	NOISE REDUCTION: Sound transmission trough partitions, composite transmission loss, a case study.								
11	NOISE REDUCTION: Enclosures, barriers, pipe wrappings, a case study.								
12	ENVIRONMENTAL NOISE: Calculation and estimation of environmental effects of transportation noise (road traffic, railway traffic and airline noise), land use and noise, a case study.								
13	MIDTERM 2: Examination, solution of questions, Video: Environmental Transportation Noise.								
14	NOISE CONTROL ENGINEERING: A general quick review of industrial applications, law related to noise, Turkish Noise Control Regulation and its applications.								