

Department of Electrical and Computer Engineering

ENGINEERING ACOUSTICS / ACOUSTICS

EEN502/MMI361/CAE590 Section - J, MW 5 - 6:15 (LC110)

FALL 2008

Instructor: Dr. Michael Scordilis, m.scordilis@miami.edu

Office Hours: M 1-2, W 12-1 and by appointment

- References:** [1] Moser, M., *Engineering Acoustics: An introduction to noise control*, Springer 2004
 [2] Rossing, T., Moore, F.R., Wheeler, P.A., *The Science of Sound*, Addison Wesley 2002
 [3] Zwicker, E., Fastl, H., *Psychoacoustics, Facts and Models*, Springer 1998
 [4] Mehta, M. et al., *Architectural Acoustics, Principles and Design*, Prentice-Hall 1998
 [5] Egan, M.D., *Architectural Acoustics*, J. Ross Pubs. 2007

Course Objectives: understanding of the physical aspects of acoustics and sound propagation, appreciation of physiological and psychological acoustics, knowledge of the basic principles of human speech production and perception, acoustics of buildings, and computer-aided techniques for experimenting with acoustic principles.

Lectures	Topic		Homework due	Project due	
1	8/26 W	Course Introduction and Matlab Review			
2	8/31 M	Physical Acoustics	Basic principles of physical acoustics		
3	9/2 W		Wave propagation in gases		
4	9/9 W		One and three-dimensional sound fields	1	
5	9/14 M		Power, energy, intensity. Point and line sources		
6	9/16 W		Volume velocity sources		
7	9/21 M		Loudspeaker Arrays. The one dimensional piston	2	1
8	9/23 W		Electronic beam steering and "far field" conditions		
9	9/28 M		Sound Absorbers	Structure-borne sound	
10	9/30 W	Sound propagation in tubes. Tube impedance		3	
11	10/5 M	Test No. 1			
12	10/7 W		Wall impedance		
13	10/12 M		Theory of locally reacting absorbers		
14	10/14 W		Specific absorbent structures	4	2
15	10/19 M	Room Acoustics	Reverberation and steady state		
16	10/21 W		Concert Hall and Opera House acoustics		
17	10/26 M	Building Acoustics	Measurement of airborne transmission loss	5	
18	10/28 W		Single partitions		

19	11/2 M	Building Acoustics	Double-leaf partitions and impact sound reduction				
20	11/4 W	Physiological Ac.	Speech and language production. Singing	6			
21	11/9 M	Test No. 2					
22	11/11 W	Physiological Acoustics and Psychoacoustics	Acoustic phonetics of English			3	
23	11/16 M		The human ear: function and modelling		7		
24	11/18 W		Masking; psychoacoustical tuning curves				
25	11/23 M		Temporal masking effects				
26	11/25 W		Psychoacoustical models of perception		8		
27	11/30 M		Loudness				
28	12/2 W	Application of phychoacoustics in speech & audio		9		4	
Course Assessment:			Homework: 10%; Computer projects: 30% Two in-class tests: 40%; Final exam: 20%				
Grades scale:			A+>95%, A>90%, A->85%, B+>80%, B>75% B->70%, C+>65%, C>60%, C->55%, D>50%				

