ENGR 515/ PHYS 521
Introduction to Acoustics
Draft Syllabus 8/19/03

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Goals: to give first year graduate students and seniors a general understanding of the rudiments of acoustics including a working knowledge of the terminology as well as a flavor of certain special topics to be determined by the instructor such as noise control, transducers or architectural acoustics

Lecture	Date	Topic	Reading (3rd ed.)	Reading 4th ed.)
1	8/19	Introduction to Acoustics		
2	8/21	Vibrations of strings	2.1-2.7	2.1-2.7
3	8/26	Vibrations of plates and membranes	4.1-4.4,4.7	4.1-4.4,4.8
4	8/28	Equations of Fluid Mechanics	5.1-5.4	5.1-5.4
5	9/2	Speed of sound; Harmonic plane waves	5.5-5.7	5.5-5.7
		Impedance, intensity, Acoustic power	5.9-5.10	5.9-5.10
6	9/4	decibel scale, Spherical waves	notes+5.11,5.12	notes-5.11,5.12
7*	9/9	Other WE's (Moving media, heat sorce, inhomogeneous media.)	notes	notes
8*	9/11	Guest Lecture on Thermoacoustics	notes	notes
9	9/16	Sources (Directivity etc.)	5.15	5.16
		Transmission / Reflection (2 Fluids)	6.1, 6.2, 6.4	6.1, 6.2, 6.4
10	9/18	Transmission / Reflection (3 media)	6.3	6.3
		Transmission through a wall (mass law)	notes + 12.12-12.15	notes + 13.12-13.15
		Transmission / Reflection (Complex Surfaces)	6.5, 6.6	6.6
11	9/23	porous media	notes	notes
12	9/25	Diffraction from barriers	notes	notes
13	9/30	Pipes, cavities and resonators	9.1-9.7, 10.1-10.2	9.1-9.2, 10.1-10.8
14	10/2	Spectral analysis/ Fourier series	notes + demo	notes + demo
15	10/7	Fourier transforms, filters, and octave bands	11.1,11.2 + notes	11.1,11.2 + notes
16	10/9	Open for review		
17	**10/14**	**MID TERM EXAM**		
18	10/16	Weighted sound levels (dBA)	11.3,12.1,12.2	11.3,13.1,13.2
		and combining dB's	+ notes	+ notes
19	10/21	Industrial Acoustics, Noise dosage, OSHA regs	12.3, 12.11+ notes	13.3, 13.11+ notes
		impulsive sources, speech interference		
20	10/23	Environmental Acoustics,	12.4-12.10 + notes	13.4-13.10 + notes
		community noise standards and annoyance		
21	10/28	Architectural Acoustics (reverb time,	13.1-13.4 + notes	12.1-12.4 + notes
		absorption, sound levels in a room)		
22	10/30	Open to allow flexibility in lectures 17-20		
23	11/4	Non Linear Acoustics	notes	notes
24	11/6	Non Linear Acoustics (cont.)	notes	notes
25*	11/11	Underwater Acoustics (deep water)	15.1-15.6 + notes	15.1-15.6 + notes
26*	11/13	Underwater Acoustics (shallow water)	15.14 + notes	notes
27	11/18	Underwater Acoustics (cont.)		
28	11/20	open		
	11/24-11/28	THANKSGIVING HOLIDAY		
29	12/2	Guest Lecturer on active research at NCPA		
		(Aeroacoustics, RUS, porous media, etc.)		
30	12/4	review		
	12/8	**NOON FINAL EXAM**		

* subject to change

Grading:

Homework (roughly 12/weekly)	10%
Mid Term	40%
Final	50%