

ENGR 515/ PHYS 521
Introduction to Acoustics
Draft Syllabus 8/23/05

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

† subject to change

* ASA mtg in Minneapolis

Grading:

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