

ME 520 Acoustics I (Fall 2009)

Course Description

Introduction to wave propagation and sound. General concepts such as quantitative measures of sound, plane waves, and acoustic energy density and intensity. Perception of sound. Derivation of wave equation. Reflection, transmission and refraction of sound. Normal modes: vibrating membranes, and sound in a rectangular enclosure. Acoustic horns. Propagation in stratified media - ray acoustics. Absorption and attenuation of sound waves. Acoustic waves in spherical co-ordinate systems.

Instructor

[Robin Cleveland](#)

Office: ENG 416

Department of Mechanical Engineering

Boston University

110 Cummington Street

Boston MA 02215

Phone: 617-353-7767

Email: robinc@bu.edu

Class Period

Mon and Wed 2-4pm PSY B47 (Basement, Sociology)

Office Hours

By appointment

Text Book

PRIMARY

D.T. Blackstock, Fundamentals of Physical Acoustics, (Wiley 2000)

SECONDARY

A.D. Pierce, Acoustics: An Introduction to Its Physical Principle and Applications, (ASA-AIP, 1994)

Further Reading:

Kinsler, Frey, Coppens and Sanders, Fundamentals of Acoustics, (Wiley, 1982)

S. Temkin, Elements of Acoustics (ASA, AIP, 2001)

L. D. Landau and E. M. Lifshitz, Fluid mechanics (Butterworth Heinemann, Oxford, UK, 1997)

Homework

[Homework 1](#) Due Wed 9 Sep

Grading:

Homework 25%

Test 1 25%

Test 2 25%

Final Exam 25%

Mid-term tests: In class - dates subject to change.

Test 1: Wed 7th October

Test 2: Monday 16th November

Final Exam:

Friday 18 Dec 12:30-2:30 pm (subject to change)

Anticipated Schedule
ME 520 - Acoustics I
Fall 2009

Date	Blackstock	Pierce
2 Sep	1.A, 1.B	1.1, 1.6, 1.7
7 Sep	NO CLASS – Labor Day	
9 Sep	1.C, 2.A	1.2-1.5
14 Sep	1.D, 1.E	1.8-1.12, 2.3
16 Sep	3.A, 3.B,	3.2, 3.3, 3.4
21 Sep	3.C 3.D,	3.3, 3.4, 3.6
23 Sep	4.A, 4.B	7.2, 7.3
28 Sep	4.C, 4.D	7.4, 7.5
30 Sep	4.D 4.E,	7.5
5 Oct	4.E, 4.F	
7 Oct	TEST 1	
12 Oct	NO CLASS – Columbus Day – Class on TUESDAY	
13 Oct	5.A. 5B	3.5
14 Oct	5.C	3.7 18 Oct 5.D 3.5
19 Oct	6.A	3.6
21 Oct	6.B	6.5
26 Oct	6.C	7.1
28 Oct	NO CLASS	
2 Nov	6.D	7.1
4 Nov	7.A 7.B	7.8
9 Nov	7.B, 7.C	7.8
11 Nov	NO CLASS – Veterans Day	
16 Nov	TEST 2	
18 Nov	7.C 7.D	7.8
23 Nov	8.A. 8.B	8.4
25 Nov	NO CLASS – Thanksgiving Break	
30 Nov	8.B 8.C	8.4
2 Dec	8.C	8.4
7 Dec	9.A, 9.B	10.1-10.3
9 Dec	9.C, 9D	10.7, 10.5

FINAL EXAM – Friday 18 Dec 12:30-2:30 pm (subject to change)