4/4/08

ENVH 457 - Industrial and Environmental Noise

Instructors: Noah Seixas, Professor; nseixas@u.washington.edu
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Meets: Tu 10:30-11:20, T-474A
Th 10:30-12:20, T-474A

Credits: 3

Office Hours by appt. Phone 685-7189
Contact Information:
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4225 Roosevelt Way NE, Room 121

Course Outline:
This is an introductory course covering evaluation and prevention of hazards due to noise and vibration. The course is intended mainly for upper division undergraduate and graduate students in environmental health, safety engineering, and exposure sciences, including industrial hygiene. Topics covered will include physical aspects of sound waves, sound measurement, exposure assessment methods, noise induced hearing loss, and engineering and programmatic approaches to control. Emphasis will be on the recognition, evaluation, and control of occupational noise induced hearing loss hazards with additional discussion of community and environmental exposures where appropriate.

Class readings:
Any supplemental class reading materials will be made available on reserve in the Health Sciences library, and an additional copy will be placed in F-225 for reading.
These materials may be borrowed for brief periods for photocopying.

Assignments and grading:

Readings, listed below and supplemented in class.	
One problem set	15%
Group noise survey project presentation	20%
Midterm exam	25%
Final exam	30%
Class participation	10%

Text:
Lamancusa, Noise Control. Online at: http://www.mne.psu.edu/lamancusa/me458/

NIOSH Criteria Document. Online at: http://www.cdc.gov/niosh/topics/noise/pubs/no_pubs.html

NIOSH Noise control document online at http://www.nonoise.org/hearing/noisecon/noisecon.htm

Recommended: Noise Control in Industry, Canadian Centre for Occupational Health and Safety.

Learning Objectives:

At the end of this course, the student should be able to:

1) Define characteristics of noise and vibration exposure using appropriate terminology and units.
2) Calculate noise levels on the dB and dBA scales across frequencies and time.
3) Explain how human hearing works and how noise or vibration affects hearing and health.
4) Describe the major methods used for evaluating hearing and identify noise-damaged hearing.
5) Evaluate worker and community noise exposures using common measurement tools and techniques.
6) Design an effective occupational hearing loss prevention program
7) Determine appropriateness of various hearing protection devices for specified applications.
8) Evaluate and recommend alternative noise control techniques.

Date	**Topic**		**Readings**
4/1	Introduction to noise and vibration	NS	Lamancusa Ch 1, Berger Ch.
4/3	Acoustics 101: Pressure, power and intensity: decibels	NS	Lamancusa Ch 5, 6
4/8	Frequency- and time-domain analysis	NS	Lamancusa Ch 4.2, 7.5-7.12
4/10	Noise exposure metrics and standards	RN	NIOSH, Ch 3 Lamancusa Ch 3, 4.3-
4/15	Physiology of hearing	PF	Lamancusa Ch 2
4/17	Hearing measurement, Hearing impairment	PF/JD	Homework 1 Due
4/22	Sound measurement equipment	RN	Lamancusa Ch 7.1-7.4, NIOSH, Ch 4
4/24	Noise measurement exercise – in class	NS	
4/29	Epidemiology of NIHL, HL Prediction	NS	Johnson
5/1	**Midterm exam**		
5/6	Hearing loss prevention programs	NS	NIOSH Ch 5, Daniell
5/8	Hearing Protection Devices	NS	NIOSH Ch 6
5/13	Noise Control Principals	GC	Lamancusa Ch 8, 9 NIOSH Doc
5/15	Noise control assessment and examples	GC	
5/20	Project planning, calibration, etc.	NS	
5/22	Group project (Field noise survey – no class meeting)	NS/RN	
5/27	Vibration exposure monitoring, standards, control	PJ	Wasserman articles
5/29	Community noise and non-auditory health effects	H Davies	Passchier-Vermeer
6/3	No Class – AIHCE	RN	
6/5	Student presentations on survey results	NS	
6/?	**Final Exam**		