Tennessee Technological University
Department of Civil & Environmental Engineering
CEE 4930 (5930) – Noise Control
Elective
Spring Semester 2008

2007 Catalog Data: CEE 4930 (5930): Noise Control. Lecture 2. Lab 2. Credit 3. Identification and description of noise sources and noise radiation, methods of noise measurement and criteria for noise levels, principles and techniques of noise control. Prerequisite: MATH 2120, PHYS 2110.

Textbook: None

References: Lord, Noise Control for Engineers
Wilson, Noise control

Coordinator: Mechanical Engineering Thermal Systems Group and the Undergraduate Program Committee

Goal: To introduce the concepts and practices of noise control, and provide experience in acoustic measurements techniques.

Course learning objectives:
1.   To introduce the concepts and practice of noise control
2.   To provide experience in acoustic measurements techniques

Course measurable outcomes:
Students will be expected to:
1.   use decibels and frequency weighting;
2.   measure sound pressure levels and evaluate sound power levels;
3.   evaluate and measure reverberation times/absorption;
4.   use and measure various noise criteria;
5.   identify the characteristics of various noise sources
6.   identify various ways to control noise

Topics covered: (1 lecture class per week, 120 minutes each; 1 lab per week, 120 minutes each)
1.   Basic principles and definitions (2 classes)
2.   Sound fields and Directivity (2 classes)
3.   Absorption and reverberation time (2 classes)
4.   Noise sources (2 classes)
5.   Noise control criteria, noise regulations (2 classes)
6.   Methods of noise control (2 classes)
7.   Case histories (2 classes)

Contribution of the course to meeting professional component:
This course is an elective for Mechanical Engineering and Civil and Environmental Engineering students. It onsists of fundamental concepts in noise reinforced with practical applications and measurements.

ABET category content as estimated by faculty member who prepared this course description:

Engineering Science: 90%
Engineering Design: 10%

Relation of course to program outcomes:

Outcome 1: The graduates will have a broad understanding of the relevant principles of mathematics, science, and engineering.
Outcome 4: The graduates will be capable of design activities and have the ability to identify, formulate, and solve civil engineering problems.
Outcome 5: The graduates will have effective communication skills.
Outcome 6: The graduates will be capable of functioning on multi-disciplinary teams.
Outcome 7: The graduates will have an understanding of experimental processes.
Outcome 8: The graduates will have the ability to use techniques, skills, and modern engineering tools needed for engineering practice.

The students gain very practical experience in this class, which will allow them to work confidently in the area of noise control. The students who successfully complete this class should have a solid foundation in their understanding of noise, a good ability to gather and analyze noise data, and an understanding of the impact of noise in our society.

Relation of course to ABET Criteria:

General Criteria		Bloom's Level of Achievement
(3a)	Knowledge of math, science, engineering	3
(3b)	Design, conduct experiments; analyze and interpret data	5
(3c)	Design a system, component or process	2
(3d)	Multidisciplinary teams	2
(3e)	Identify, formulate, and solve engineering problems	3
(3g)	Effective communication	2
(3k)	Techniques, skills, modern tools for engineering practice	4

Program Criteria		Bloom's Level of Achievement
1.	Apply knowledge of math and sciences	3
2.	Conduct civil engineering experiments and analyze and interpret the resulting data	5
3.	Design a system, component, or process in more than one civil engineering context	2

Computer usage:

Recommended for some homework assignments and labs, software left to the choice of the students.

Laboratory projects:

L1. Familiarization with sound level meters and equipment (1 lab)
L2. Sound power measurement in a reverberation room (2 labs)
L3. Sound power measurement in an anechoic chamber ((2 labs)
L4. Reverberation time measurement (2 labs)
L5. Sound absorption measurement in a reverberation room (2 labs)
L6. Environmental noise measurement (3 labs)
L7. Field measurements (current problems) (1 lab)
L8. Field measurements (current problems) (1 lab)

Prepared by: C. M. Darvennes   Date: October 2007