

**Course:** IHS 527 – Noise Measurement and Control

**Semester:** Spring 2020

**Number of credit hours:** 3

**Description:** IHS 527. Noise Measurement and Control. 3 Hr. PR Senior or graduate student. Includes the study of noise physics, effects of noise on hearing and well-being, noise exposure regulations, and engineering of noise controls. Practical experience with noise dosimeters, sound level meters, and instrumentation used to assess human noise exposure is provided by classroom demonstration and by a field trip.

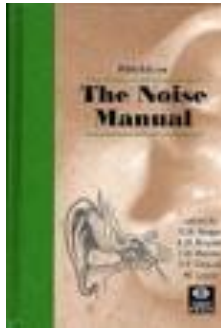
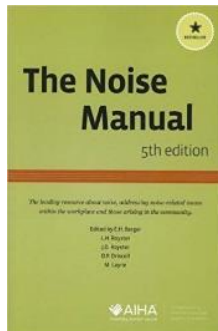
**Prerequisite:** Senior or graduate student

**Textbook:** **The Noise Manual, Fifth Edition**

Edited by Elliott H. Berger, Larry H. Royster, Julia D. Royster, Dennis P. Driscoll, and Marty Layne

Optional: **The Noise-Vibration Problem-Solution Workbook**

Purchase at Amazon or both books together as a set from the American Industrial Hygiene Association (join as student member first to receive discount). [www.AIHA.org](http://www.AIHA.org)



Additional materials on eCampus

**Instructor**

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**Course Goals/Learning Objectives:** Students will be able to:

1. Compute values related to the fundamentals of the physics of noise, including effects of distance, multiple sources, etc. on noise levels.
2. Understand OSHA and NIOSH regulatory standards
3. Describe hearing conservation programs, including audiometric testing and hearing protection.

4. Do noise measurement and noise surveys.
5. Compute values needed for engineering controls of noise and vibration.

**IH Educational Outcomes:** This course helps achieve the Educational Outcomes for the MS Industrial Hygiene Program in the following areas:

1. an ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice, such as: Principles and methods of control of physical and chemical hazards. (IMSE 564, 660 and IH&S 627, 628)
2. the ability to apply knowledge of math, science, and Industrial Hygiene. (Project, IH&S 628)
3. the ability to work individually, on teams, and/or on multi-disciplinary teams to identify, formulate and solve problems using Industrial Hygiene, safety, and ergonomics knowledge, skills and tools. (Project, 628)
4. an ability to formulate or design a system, process or program to meet desired needs. (IMSE 564, 660 and IH&S 627, 628)
5. The latter 3 are evaluated in the noise project

### Performance Metrics:

1. Faculty assessment of home works, projects, and exams.
2. Student self-assessment.

### Grading Elements, Weighting and Scale:

Grade Element	Weighting	Grade Scale
Midterm(s)	35%	A =>90
Final(s)	35%	B =>80
Quizzes and Homework	15%	C=>70
Projects and labs	15%	D=>60
		F<60

**Cheating and mutual assistance:** Cheating on exams will produce severe consequences. For laboratory reports, each student is expected to write their own reports with no assistance in organizing or writing the report from anyone other than the instructor. Students may be organized into groups to execute the labs or projects and to collect data. Students may share such data and discuss how it should be used in a report, but may not plagiarize each others tabular or written presentation in the reports. Likewise, students may discuss how the data should be analyzed, but may not use the analyses done by another or provide their own analyses to another student.

### Statement on Attendance:

Student attendance is expected unless excused by the instructor. The basis for an excused absence will follow University and IMSE policy. Class attendance will not be taken each week, but class participation is expected.

**Statement on Social Justice:**

West Virginia University is committed to social justice. I concur with that commitment. I expect to foster a nurturing learning environment that is based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, you must make appropriate arrangements through Disability Services (293-6700). They will identify the nature of the accommodation your disability requires.

**Statement on Disability Accommodation**

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, you must make appropriate arrangements through Disability Services (293-6700). They will identify the nature of the accommodation your disability requires and inform me of appropriate accommodations.

### Approximate Course Topic Outline

Course Topic	Emphasis in Reading. Chapter:
Introduction	1, 5, 18
Anatomy and Physiology of the Ear: Normal and Damaged Hearing	4
Physics of Sound and Vibration	2
Audiometric Testing, including lab	
Standards and Regulations for Dose Assessment, including dose calculations OSHA NIOSH, ACGIH	16
Sound Measurement: Instrumentation and Noise Descriptors, including demonstrations and lab	
Noise surveys and data analyses, including lab	7
Midterm	
Hearing Protection Devices	10
Noise control engineering	9
Elements of a hearing conservation program	6, 8, 11, 12
Standards for programs:	
Program overview and administration	
Education and motivation	
Hearing protection devices	
Audiometric monitoring	
Evaluating program effectiveness	
Special topics	
Final exam	

**Prepared By: Ziqing Zhuang, Ph.D.**  
**Date: December 2019**