HESP 710: INDUSTRIAL AND ENVIRONMENTAL NOISE PROBLEMS
Fall, 2016

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# Course Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Readings</th>
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| September 13 | Noise-induced damage to the cochlea  
| September 20 | Noise-induced damage to the central auditory system  
Early noise exposure effects and age-related hearing loss  
| September 27 | Noise measurement and instrumentation  
Risk assessment  
*In-class worksheet*  
| October 4  | Noise regulations  
*In-class worksheet*  
*Media topic* | 1. NIOSH criteria for a recommended standard  
2. MSHA Federal Register  
3. Federal Railroad Administration |
| October 11 | Noise control  
Efficacy of hearing conservation programs |
# In-class worksheet

## Review for midterm

### Readings


### October 18

#### MIDTERM (Take-home exam due 11:59 pm on 10/25/16)

### October 25

#### Noise-induced hearing loss and the military; Blast injury

**Media topic** GUEST LECTURER from Walter Reed – LTC Blank

### Readings


### November 1

#### Hearing protective devices and fitting practicum

**In-class worksheet**

### Readings

2. Earlogs 1-21

### November 8

#### Synergistic effects of noise and other agents

**Susceptibility to NIHL**

**Media topic**

### Readings


### November 15

#### Recreational noise

**Music-induced hearing loss**

**Noise-induced hearing loss in children**

**Media topic**

### Readings

| November 22 | Hearing critical jobs/Drafting hearing standards |
| Auditory fitness for duty |
| Audiolists as expert witnesses |
| Media topic |

| November 29 | Therapeutic agents to prevent NIHL |

| December 6 | 4. Student presentations |

| December 13 | 3. Take-home final posted |

| December 20 | Take-home final submission due date |

**Grading System**

Summary of point system:

| In-class worksheets: 10 points each | 4 worksheets x 10 pts = 40 |
| Media presentation: 20 points each | 1 presentation x 25 pts = 20 |
| Research paper/Project: 50 points each | 1 project x 50 pts = 50 |
| Noise survey: 50 points each | 1 project x 50 pts = 50 |
| Midterm: 120 points | 1 exam = 120 |
| Final: 120 points | 1 final = 120 |

**University of Maryland Grade Policy**

<table>
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<tr>
<th>Course Average</th>
<th>Course Grade</th>
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LEARNER OUTCOMES

Students will acquire knowledge in noise control, hearing conservation, industrial audiology, occupational audiology, and fitness-for-duty evaluation.

As a result of knowledge obtained in this course, students will be able to:

1. Provide a historical outline of industrial audiology, noise control, and hearing conservation program development, including military audiology.
2. Reference the legal basis for hearing conservation and noise control programs.
3. Understand the legal basis for worker’s compensation resulting from overexposure to noise.
4. Measure and quantify noise levels and noise dose.
5. Develop and implement an effective hearing conservation program.
6. Select an appropriate hearing protective device, and evaluate effectiveness.
7. Understand how noise interacts with other physical and chemical exposures.
8. Identify, evaluate, and quantify noise effects using audiological test procedures.
9. Recommend noise control strategies and engineering controls.
10. Understand and manage special cases in noise, such as musicians, military members, extreme exposures, and those with special communication needs.
11. Have a working knowledge regarding research in prevention of noise induced hearing loss using pharmaceuticals.
12. Evaluate and make recommendations for management of recreational noise.
13. Provide an audiometric fitness-for-duty evaluation.
14. Understand how to develop an audiometric standard based on essential job functions.

Each student’s knowledge and skills in these areas will be determined by the following assessment procedures:

1. Written examinations (one mid-term examination and one final examination).
2. Research abstracts/project
3. Noise measurement project
4. Attendance and participation in class and in-class worksheets

Research Paper or Project

Each student must submit a short research paper on a relevant topic of interest. Papers should be 5-10 pages in length, double-spaced, and must be appropriately referenced with at least three peer-reviewed journal articles. In lieu of research paper, you may also opt to submit a relevant project. Be creative! I am open to suggestions. Topic or project must be improved by instructor by 27 SEP 16; paper or other work product must be submitted online by 22 NOV 16.

Research suggestions include, but are not limited to:
Drugs for prevention of NIHL
Temporary threshold shift
Musicians and NIHL
Blast exposure and NIHL
Different effects of continuous/intermittent vs impulse/impact noise exposures
Synergistic effects of industrial toxins and noise
Biochemical changes following noise exposure
Presbycusis and noise-induced hearing loss
Non-auditory effects of noise
Acoustic reflex and noise-induced hearing loss
Ear protectors
Forensic audiology
Conditioning or toughening effects

Project suggestions include, but are not limited to:
- Compare different combinations of double protection
- Create a business plan for an industrial audiology service
- Develop a training video or brochure
- Develop a hearing standard for a particular job
- Develop a testing protocol for fitness for duty for a particular job
- Evaluate a particular product, pros and cons
- Review a relevant product liability case
- Establish real world NRR’s on a particular type of hearing protection
- Outline a noise control strategy for a particular industry
- Compare and contrast various strategies to establish PAR (Personal Attenuation Rating) or different fit-check systems currently available

**Noise Measurement Project**
Students are required to select an area or operation and perform a noise survey. Students must measure environmental noise using both a sound level meter and a noise dosimeter. Use the sound level meter to establish hazard radius; use the dosimeter to determine dose and whether or not the exposure rises to the level of OSHA’s PEL. The area or operation must potentially be noise hazardous. After gathering relevant data, each student will submit measurement data along with a brief presentation to the class describing the findings, and will offer recommendations for personnel who work or play in that environment.

Suggestions include, but are not limited to:
- Newspaper press room
- Bottling Plant
- Military Ordnance Test Center
- Airport
- Recreational setting such as Dave & Busters
- Bakery
- Military Air Station (Andrews AFB or Patuxent River)
- Local Firing Range
- Motocross or Drag Race
- Mining operation
- Wood working or furniture making operation
Construction Site
Landscaping operation
Metro subway system
Concert venue
Local bar or restaurant

Suggested Report Format:

**Background** – Why did you select this site or operation?

**Methodology** – Describe IN DETAIL what you did: instrumentation used, procedures followed, how equipment was programmed; Keep a time log of what happened when so you can refer to it in your discussion.

**Data** - What you found: include relevant graphs, charts, and important data such as peak, TWA or LAVG (dBA and dBC), noise dose

**Analysis** – Your interpretation of what the data means

**Recommendations and Conclusions** – What you would recommend in terms of noise control, hearing protection, avoidance measures, etc. if someone were to work or play in this environment

Project sites must be approved by instructor. Each student must select a different site to ensure a wide range of samples. Sites must be selected and approved by instructor by 27 SEP 2016. You will present a powerpoint of your findings on the last day of class on 6 DEC 2016. Design your powerpoint as if you were presenting it to company personnel. Dr. Gordon-Salant is providing three dosimeters for this project. Please see me to check them out.

**UNIVERSITY POLICIES**

**Academic Integrity**
The University administers an Honor Code and an Honor Pledge, available on the web at [http://www.jpo.umd.edu/aca/honorpledge/htm](http://www.jpo.umd.edu/aca/honorpledge/htm). The Code prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents, and forging signatures. Students are requested to write the following signed statement on each examination or assignment: “I pledge on my honor that I have not given or received any unauthorized assistance on this examination (or assignment).” Compliance with the code is administered by a Student Honor Council, which strives to promote a “community of trust” on the College Park campus. For additional information, see the Office of Judicial Programs and Student Ethical Development website ([http://www.jpo.umd.edu/](http://www.jpo.umd.edu/))

**Accommodations for Students with Disabilities**
If you have a documented disability and wish to discuss academic accommodations with me, please contact me before 27 SEP 15. If necessary, please contact the Disability Support Service (301-314-7682) for assistance in determining and implementing appropriate academic accommodations.

**Confidentiality-Posting Grades**
The University complies with the regulations set forth in the Buckley Amendment. The amendment protects the student from the disclosure of personal and academic information to anyone other than the student, including parents, except under special circumstances. Posting
student grades with either student names or social security numbers-in while or in part-is strictly prohibited. Grades will be available on ELMS), UMEG, or directly from the instructor.

**Religious Observances**
The University System of Maryland policy on religious observances provides that students should not be penalized because of observances of their religious beliefs; students shall be given an opportunity, whenever, feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. I will make every feasible effort to accommodate student’s requests based on attendance of religious observances. *It is the student’s responsibility to inform me of any intended absences for religious observances in advance. Notice should be provided as soon as possible, but no later than the end of the schedule adjustment period.* Prior notification is especially important in connection with final examinations, since failure to reschedule a final examination before the conclusion of the final examination period may result in loss of credits during the semester. To review the University’s policy or view a variety of other religious holidays, see [http://www.faculty.umd.edu/teach/religious.htm](http://www.faculty.umd.edu/teach/religious.htm).

**REQUIRED READINGS**
HESP 710 Collection of Readings – are available as .pdf files on the course website.

**Recommended Texts:**
- CAOHC Manual (4th edition)