



## ENV H 490/590: Health & Safety of Physical Agents in the Workplace

**3 credits, Graded**

**Pete Johnson, Professor**

**Spring 2019**

**Mondays & Wednesdays, 8:30 to 9:50 AM**

**HSB T474**

### Course Description

This is an introductory course covering evaluation and prevention of hazards due to physical hazards in the workplace. Hazards addressed include noise, vibration, physical agents, ionizing and non-ionizing radiation and thermal stress. The course is intended mainly for upper division undergraduate and graduate students in Environmental Health, Safety Engineering, Industrial and Systems Engineering, and Exposure Sciences, including Occupational Hygiene. For each topic area, we will address basic physical concepts, health risks, measurement techniques, interpretation of guidelines and standards, and control techniques.

### Primary Instructor



**Pete Johnson, Professor**

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**Office Hours:** By appointment or drop in

### Learning Objectives

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

1. Define characteristics of multiple physical agent exposures using appropriate terminology and units.
2. Calculate exposures to physical agents over time and energy levels (e.g., sound and electromagnetic frequency, particle energies).
3. Determine if exposures exceed current guidelines for acceptable exposure.
4. Explain how physical agents interact with human tissues or organs to produce changes associated with health outcomes.
5. Evaluate worker and community exposures to physical agents using common measurement tools and techniques.
6. Determine appropriateness of various personal protective devices for physical agents.
7. Describe and recommend alternative control techniques for physical agents.

## Syllabus and Schedule

Please see the [Syllabus Page \(https://canvas.uw.edu/courses/1290764/assignments/syllabus\)](https://canvas.uw.edu/courses/1290764/assignments/syllabus) for a complete syllabus for this course. The [Modules Page \(https://canvas.uw.edu/courses/1290764/modules\)](https://canvas.uw.edu/courses/1290764/modules) provides a session-by-session schedule and links to all necessary course materials.

## Textbook and Readings

- Occupational Ergonomics – Principal and Applications. F. Tayyari and J.L. Smith. 1997 (optional)
- The Noise Manual. AIHA Press (optional)
- Radiation Protection, Jacob Shapiro. Harvard University Press, 4th edition. 2002. (optional)
- Any supplemental class reading materials will be posted and made available as needed on the Modules page.

## Assignments and Grading

All students will be expected to complete assigned readings and come to class prepared to engage in class discussion on assigned topics. There will be a total of 4 problem sets including the write-up of laboratories addressing measurement and control of physical hazards. Laboratories will be conducted as group exercises and written up individually. There will be one mid-term and one final, non-cumulative examination. Graduate students (registered for 590) will be expected to perform on these assignments at a level expected for graduate study, and will have additional components within the problem set/labs.

Grading will be as follows:

| <b>Assignment</b>      | <b>% of Grade</b> |
|------------------------|-------------------|
| Four Problem Sets/Labs | 40%               |
| Exam 1                 | 20%               |
| Exam 2                 | 20%               |
| Class Participation    | 20%               |