

**ENVH 453**

**Occupational Hygiene**

T663

Autumn, 2016

*Instructors:*

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*Course Web Site:*

<https://canvas.uw.edu/courses/1076460>

*Course Goals*

Overall Objective: to provide an introduction to the principles and practice of occupational hygiene for students not majoring in this subject area. Occupational hygiene is concerned with the *Anticipation, Recognition, Evaluation and Control* of work place hazards to health and safety. These functions all require a sound understanding of industrial toxicology, methods of exposure measurement, behavior of chemical and physical agents in the environment, the application of guidelines and standards, and technical and administrative approaches to controlling risks from these exposures, topics that form the basic elements of the course.

*Course Objectives:*

Upon completing the course, each student should expect to:

1. Describe the nature of the health effects associated with exposure to industrial agents;
2. Be familiar with the standard methods for measuring and evaluating worker exposure to chemical and physical agents and identify strengths and weaknesses to typical approaches;
3. Apply and interpret health and safety standards and regulations for the work place environment;
4. Apply feasible approaches to controlling worker exposure to health and safety hazards to a specific industrial setting.
5. Describe how the social and economic context of work affects workers' and employers' ability to control threats to health and safety.

*Course Format*

Instruction will consist of one to two lecture sessions per week, with four in-class problem solving exercises. Students are expected to view materials, read texts and solve problems on assigned topics between each class. In-class exercises will require assembling and reading background materials in advance, with group problem-solving in class and individual written responses to selected material.

1. Reading assignments will be made for most lectures and should be completed prior to the lecture. All required reading will be from the text, from public domain publications on the internet, or from the TLV Booklet (required texts listed below.) The student is held responsible for the material covered in the reading assignments.
2. Active participation in the problem-solving exercises is expected. Each exercise will involve reading background material provided, finding and assembling supplemental information needed to solve the problems, and responding with a written assignment. In-class discussions will be conducted in assigned groups and with the whole class.
  - 2a. Each student will answer a few short (e.g., 1 paragraph) questions about each exercise. Due one week after the in-class exercise.
  - 2b. For two of the four exercises, each student will develop a comprehensive paper addressing the background, analysis and recommendations, with associated background material. Final version is due two weeks later. Undergraduate papers will be approximately 5 pages. Graduate student papers will be approximately 7 pages, include at least five references from the peer reviewed literature, and will delve into one aspect of the problem in more detail.
3. One final exam will be given to test students on integrative concepts of the quarter, and specific information delivered on the final three class topics.

#### Evaluation

	<u>% of grade</u>
Classroom preparation and participation	20
2 Exercise short answer assignments	20 (10% each)
2 Comprehensive papers	40 (20% each)
Final Exam	20

#### Required Texts

Morgan, M.S., Horstman, S.W. *Introduction to Occupational Hygiene*. 2013. Available free of charge on course web site, as a series of pdf documents.

ACGIH TLV Booklets, 2013 Edition: Provided free of charge.

Additional readings provided as pdfs on course website

#### Suggested General References

- These are available for use in the Department Library F-453, or for loan in F-226:

American Conference of Governmental Industrial Hygienists. *Documentation of the Threshold Limit Values*. 7th Edition. 2001. (Later supplements are included.)

Anna DH, ed. *The Occupational Environment - Its Evaluation, Control and Management*. Third Edition. Fairfax, VA: American Industrial Hygiene Association, 2010.

Dinardi SR. *Calculation Methods for Industrial Hygiene*. New York: Van Nostrand Reinhold, 1995.

Finkel AJ. *Hamilton and Hardy's Industrial Toxicology*. 4th Ed. Littleton, MA: PSG Publishing Co. 1983.

Finucane EW. *Definition, Conversions, and Calculations for Occupational Safety and Health Professionals.*

Boca Raton, FL: Lewis Publishers, 1993.

Perkins JL. *Modern Industrial Hygiene.* Volume I. Recognition and Evaluation of Chemical Agents. New York: Van Nostrand Reinhold, 1997.

Berger EH, et al, eds. *The Noise Manual.* 5th edition. Fairfax, VA: American Industrial Hygiene Association, 2000.

Plog, B.A., ed., *Fundamentals of Industrial Hygiene,* 4th Ed. National Safety Council, Chicago, IL, 1996.

Popendorf WS. *Industrial Hygiene Control of Chemical Hazards.* Boca Raton, FL: CRC Press, 2006.

## ACADEMIC NOTICES

**Academic Integrity** (<http://sph.washington.edu/students/academicintegrity/>)

Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity.

The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington **Student Conduct Code** (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the **SPH Academic Integrity Policy**. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington **Community Standards and Student Conduct** website.

## Access and Accommodation

Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course.

If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or [uwdrs@uw.edu](mailto:uwdrs@uw.edu) or [disability.uw.edu](http://disability.uw.edu). DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

## INDUSTRIAL HYGIENE

## Course Schedule, Autumn Quarter, 2016

Class	Date	Module	Activity	Lead	Topic	Readings Due
1	Th 9/29	Basics	Lec	NS	Intro to Occ Hyg: What's New, What's Old	Reach: VE Rose View: Murray, FOH
2	Tu 10/4		Lec	NS	Exposure, Dose and Risk	Morgan Sec 3. ACGIH Statement and Introduction
3	Th 10/6		Lec	NS	Guidelines and Regulations	Morgan Sec 5 View: Michaels FOH
4	Tu 10/11		PBL Exer 1	NS	Deriving a standard: 1-BP	NYT article, factsheet on 1BP
5	Th 10/13	Measurement	Lec	NS	Measurement of Gases and Vapors	Morgan Sec 2, 9
6	Tu 10/18		Lec	NS	Measurement of Particulate Matter	Morgan Sec 8
7	Th 10/20 NOHC		Lec	MB	Direct Reading Instruments	
8	Tu 10/25		PBL Exer 2	NS	Measuring exposures: Bridge Prep and Paint	
9	Th 10/27		Lec	MC	Conducting a Survey	Morgan Sec 6
10	Tu 11/1	Exposure Assessment	Lec	NS	Exposure Data and Statistics	Morgan Sec 7 View: Volckens FOH
11	Th 11/3		Lec	NS	Exposure Models and Control Banding	TBD
12	Tu 11/8		Lec	CS	Biological Monitoring	ACGIH BEI Intro. Morgan Sec 10
13	Th 11/10		PBL Exer 3		Interpreting Monitoring Data: Lead Battery Mfg.	
14	Tu 11/15	Controls and Management	Lec	NS	Hierarchy and Ventilation	
15	Th 11/17		Lec	MC	PPE	Morgan Sec 14
16	Tu 11/22		Lec	NS	Work Organization and Management	Morgan Sec 15
	Th 11/24	TG Holiday	No Class			
17	Tu 11/29 (NAS)		PBL Exer 4	MC	PBL 4: Control Strategies	
18	Th 12/1 (NAS)		Lec	MC	Thermal Stress	Morgan Sec 11
19	Tu 12/6	Special topics	Lec	NS	Noise	ACGIH, Thermal Stress
20	Th 12/8		Lec	NS	Bioaerosols	
	TBD					

