
Course Syllabus:

Introduction to Environmental and Occupational Health

Semester ב: 2015

University of Haifa, School of Public Health

A. Course Introduction:

The field of environmental and occupational health is inter-disciplinary and broad. We will provide the students with a broad overview of the core topics of environmental and occupational health including toxicological concepts (source, exposure pathway, route of absorption, target organ, dose-response, susceptibility and effect), use of epidemiologic tools (sentinel events, relative and attributable risk, case-control studies, prospective cohort, cross-section, and time-series methods), and significance of major environmental exposures (ambient air and water pollution), and occupational exposures (gasses, metals, pesticides, and ionizing radiation). The course will focus on global environmental and occupational health problems and how policy, politics and leadership can impart a positive health impact on global communities.

In addition to the core topics listed above, we will discuss some of the societal aspects of environmental and occupational health including international disparities in disease incidence, impact of environmental exposures on susceptible populations, environmental and occupational health legislation, ethics and advocacy. We will practice critical review of the epidemiological literature and apply the concepts discussed in the course to real-world environmental and occupational public health hazards.

B. Course Schedule:

Lecture hours- Wednesday 14:00 – 15:30 Office hours- Wednesday before class;

C. Course Instructor:

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Yonah is an epidemiologist and physician specializing in environmental and occupational medicine. He studied environmental and occupational health at the Harvard School of Public Health where he completed an MPH and post-doctoral training in environmental epidemiology. He came to Israel on a Fulbright Scholars grant. His research interests include air pollution, heavy metal exposure and the built environment.

D. Lecture Topics:

Lecture	Topics	Readings
1	<p>Introduction to Environmental Health</p> <ol style="list-style-type: none"> 1. Overview of core topics (toxicology, exposure assessment, epidemiology, air pollution, water pollution) <p>-----</p> <p>Introduction to Occupational Health</p> <ol style="list-style-type: none"> 1. Overview of core topics (industrial hygiene, occupational injuries and illness, occupational health and safety) 2. Discuss common occupational exposures and illnesses 	<p>Chapter 1</p> <p>Chapter 2</p>
2	<p>Exposure Assessment</p> <ol style="list-style-type: none"> 1. Describe the exposure hierarchy 2. Review various types of environmental and occupational exposures and different methods to measure exposures 	Chapter 26
3	<p>Introduction to Environmental and Occupational Epidemiology</p> <ol style="list-style-type: none"> 1. Review common epidemiological methods in EOH 2. Discuss common sources of bias and error in environmental and occupational epidemiology 3. How to read and analyze environmental and occupational epidemiology literature 	Chapter 24
4	<p>Introduction to toxicology</p> <ol style="list-style-type: none"> 1. Understand the relationship between mechanistic, descriptive, and regulatory toxicology 2. Understand dose response curves and the difference between threshold and linear response 3. Understand the relationship between toxicology and the precautionary principle 	Chapter 25
5	<p>Chemical Hazards</p> <ol style="list-style-type: none"> 1. Review of common occupational and environmental chemical hazards including solvents, metals, and persistent organic pollutants 2. Discuss common routes of exposure and related health effects 	Chapter 11
6	<p>Physical Hazards- Noise, vibration, temperature, radiation</p> <ol style="list-style-type: none"> 1. Describe basic physiology of exposure to physical hazards 2. List illnesses associated with exposure to physical hazards 3. Discuss prevention and engineering controls of physical hazards 4. Briefly describe differences between ionizing and non-ionizing radiation 	Chapter 12
7	<p>Water Pollution</p> <ol style="list-style-type: none"> 1. Identify common sources of water pollution. 2. Discuss common routes of exposure and related health effects of 	Chapter 8

	aquatic toxins	
8	<p>Indoor and Ambient Air Pollution</p> <ol style="list-style-type: none"> 1. Discuss the global burden of disease attributed to air pollution 2. Identify primary pollutants to the indoor and outdoor environments <p>List associated health effects from O₃, NO_x, SO₂, and PM</p>	Chapter 6 Chapter 7
9	<p>Pesticides</p> <ol style="list-style-type: none"> 1. Learn about pesticides – what they are and what are the risks Identify the scenarios – where and when are people exposed 2. Recognize signs, symptoms and diseases that may be related to pesticide exposure <p>Know how to prevent pesticide exposure</p>	
10	<p>Built Environment: Transportation and Health</p> <ol style="list-style-type: none"> 1. Describe the current epidemiology of road trauma in terms of use exposure and risk for all road users. 2. Describe the role of the public health professional in assessment and prevention in urban and rural environments <p>-----</p> <p>Climate Change</p> <ol style="list-style-type: none"> 1. Discuss the potential mechanism of effect the changing global environment has on human health outcomes. 	Chapter 39
11	<p>Pediatric Environmental Health and Vulnerable Populations</p> <ol style="list-style-type: none"> 1. Recognize the physiological and developmental aspects which pose children at risk for environmental exposures. 2. Recognize routes of exposures to children <p>Learn preventative practices</p>	Chapter 4
12	<p>Environmental Health Policy</p> <ol style="list-style-type: none"> 1. Understand how toxicological data (NOAEL, LOAEL) is use to develop drinking water standards 2. Understand the relationship between air pollution standards and epidemiologic findings regarding the health effects of air pollution 3. Understand how human biomonitoring can inform environmental health policy 	Chapter 3
13	<p>International Environmental and Occupational Health</p> <ol style="list-style-type: none"> 1. Discussion of case studies in international EOH 2. Apply lessons learned from past failures and successes 	
14	<p>Ethics and advocacy</p> <ol style="list-style-type: none"> 1. Review case scenarios in ethical conflicts common in occupational and environmental health 2. Discuss problem solving conflicts of interests 3. Advocating for environmental and occupational safety and health <p>Course Conclusion—what next?</p> <ol style="list-style-type: none"> 1. Review of main course topics 2. Discuss educational and job opportunities in OEH (research, advocacy, prevention, clinical) 	Chapter 30 Chapter 31

E. Course Textbook:

- **Levy B, Wegman D, Baron S, Sokas R. Occupational and Environmental Health. 6th edition. Lippincott, Williams & Wilkins. 2011. (Suggested readings listed)**
- Frumkin, P. Environmental Health: From Global to Local. 2nd ed. Wiley & Sons. 2010. (Recommended additional reference)

F. Grading:

The goal of the course is to go beyond simple memorizing of facts related to environmental and occupational health. Students will also practice critical review of the public health literature and application of the concepts discussed in the course to actual public health issues. The students will be asked to present an oral group presentation to their peers. The final exam will consist of 50 questions, both multiple choice (American style) and fill in the blank questions.

- 30% 15-minute oral critique of environmental/occupational epidemiology paper
- 70% Multiple choice final exam.