

Room and Time: CHS 61-235; Tuesday 3:00 - 4:50 pm

Instructor: Dr. Patrick Allard (CHS 73-251) **Office hours:** By appointment.

Prerequisites: Preparation in biology and chemistry necessary to understand the molecular basis of disease and risk assessment and a course or familiarity in toxicology

Overview: This seminar focuses on adverse health effects of chemical, physical and biological contaminants present in the environment. Each student is required to prepare and present a professional level oral presentation covering the major components of a risk assessment document on an agent of their choice. Alternatively, a student may select an agent or exposure that has not undergone formal risk assessment by a government agency and present a review of the available literature.

Learning Objectives: The following learning objectives will be achieved in the context of preparing presentations, presenting and class participation.

COURSE LEARNING OBJECTIVES	HOW THESE LEARNING OBJECTIVES ALIGN WITH COMPETENCIES FOR SPECIFIC DEGREE PROGRAMS				
	Undergraduate Public Health Learning Outcomes	Core environmental health and cross-cutting MPH Competencies	EHS MPH competencies	EHS MS Competencies	EHS PhD Competencies
1. Research and compile scientific evidence as the foundation for chemical risk assessment	2.2. Identify scientific data, including tools of informatics, and other information for assessing the well-being of a community. 2.5. Conduct a literature search on a health issue using a variety of academic and public resources.	C.1. Describe the direct and indirect human, ecological and safety effects of major environmental and occupational agents. C.6. Identify key sources of data and use existing databases to provide background or supportive data to address research questions F.14. Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health. F.15. Differentiate between qualitative and quantitative evaluation methods in relation to their strengths, limitations, and appropriate uses, and emphasizes on reliability and validity.	I.1.1. Describe major direct and indirect human health and safety effects of major environmental or occupational agents or conditions. I.1.2. Identify the most important disease burdens with major environmental or occupational risk factors and the environmental or occupational risk factors that produce the most disease burden in either the general population or in heavily affected subgroups. I.1.3. Identify significant gaps in the current knowledge base concerning health effects of environmental or occupational agents. I.1.4. Be able to construct and interpret models of environmental health pathways to develop solutions to environmental health problems and exposures. I.2.2. Describe how chemical agents are tested for acute, sub-chronic and chronic health effects, including reproductive, developmental and carcinogenic effects, and use of "omics" methods, and interpret toxicological data in terms of relevance to human health. I.3.1 Describe how humans are exposed to chemical, physical, and biological agents in the workplace I.5.1. Use at least three of these assessment methods: quantitative risk assessment; burden of disease using disability-adjusted life years; spatial analysis and geographic information systems; health impact assessment; alternatives assessment. I.5.2. Identify areas of uncertainty in exposure and risk assessment processes	A.1. Retrieve and organize literature; synthesize and critically evaluate scientific literature in environmental health, public health and other relevant fields. A.2. Use existing databases to provide background information or data to address research questions and draw appropriate inferences/estimates from environmental health data. A.3. Evaluate seminars and presentations in environmental health and distill the critical and salient issues from them.	A.1. Judge, critique and interpret reports of individual environmental health studies; evaluate strengths and limitations of environmental health reports D.1. Apply scientific and statistical reasoning and methods to address, analyze, and solve problems in public health D.2. Deduce environmental and public health implications of research results and propose subsequent studies
2. Demonstrate the ability and skill to communicate scientific information on the health effects of an environmental hazard using an oral presentation such as Power Point	2.4. Communicate health information to a wide range of audiences through an array of media.	F. 5. Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities. F.8. Engage in dialogue and learning from others to advance public health goals. F.11. Articulate how biological, chemical and physical agents affect human health. I.10.1. Organize information and data, prepare technical reports and give oral presentations on environmental contaminants and impacts. K5.8. Develop strategies to motivate others for collaborative problem solving, decision-making, and evaluation.	I.10.1. Organize information and data, prepare technical reports and give oral presentations on environmental contaminants and impacts. I.10.2. Communicate effectively with diverse audiences I.12.1. Present cogent and well substantiated arguments for actions to address environmental health concerns I.12.2. Draw upon key information sources and references essential to environmental health practice	A.1. (see above) A.3. Evaluate seminars and presentations in environmental health and distill the critical and salient issues from them. E.1. Prepare presentation materials including outlines, posters, and Powerpoint presentations. E.2. Deliver effective oral presentations individually and as part of a team.	A.1. (see above) E. 1. Gauge the cultural background, knowledge base and skills of an audience to appropriately customize communications for the target audience E.2. Organize and make oral presentations to professionals ranging from brief scientific presentations of research findings to longer presentations

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3. Demonstrate their ability to understand how populations are exposed to an agent, how exposure is quantified, how the agent is processed in the body (toxicokinetics), how the agent acts on the body (toxicodynamics) and how society controls the risk of environmental injury.	2.2. Identify scientific data, including tools of informatics, and other information for assessing the well-being of a community. 2.5. Conduct a literature search on a health issue using a variety of academic and public resources.	C.3. Identify an appropriate target population for investigating the research question. C.4. Specify current environmental risk assessment methods. C.6. Identify key sources of data and use existing databases to provide background or supportive data to address research questions	I.1.3. Identify significant gaps in the current knowledge base concerning health effects of environmental or occupational agents. I.1.4. Be able to construct and interpret models of environmental health pathways to develop solutions to environmental health problems and exposures. I.2.2. Describe how chemical agents are tested for acute, sub-chronic and chronic health effects, including reproductive, developmental and carcinogenic effects, and use of "omics" methods, and interpret toxicological data in terms of relevance to human health. I.3.1 Describe how humans are exposed to chemical, physical, and biological agents in the workplace	A.1. Retrieve and organize literature; synthesize and critically evaluate scientific literature in environmental health, public health and other relevant fields. A.2. Use existing databases to provide background information or data to address research questions and draw appropriate inferences/estimates from environmental health data. A.3. Evaluate seminars and presentations in environmental health and distill the critical and salient issues from them.	A.1. Judge, critique and interpret reports of individual environmental health studies; evaluate strengths and limitations of environmental health reports D.1. Apply scientific and statistical reasoning and methods to address, analyze, and solve problems in public health D.2. Deduce environmental and public health implications of research results and propose subsequent studies
4. Demonstrate communication skills and professionalism in front of a group of peers when presenting information or when challenged via questions	2.4. Communicate health information to a wide range of audiences through an array of media.	F. 5. Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities. F.8. Engage in dialogue and learning from others to advance public health goals. F.11. Articulate how biological, chemical and physical agents affect human health. I.10.1. Organize information and data, prepare technical reports and give oral presentations on environmental contaminants and impacts. K5.8. Develop strategies to motivate others for collaborative problem solving, decision-making, and evaluation.	I.10.1. Organize information and data, prepare technical reports and give oral presentations on environmental contaminants and impacts. I.10.2. Communicate effectively with diverse audiences I.12.1. Present cogent and well substantiated arguments for actions to address environmental health concerns I.12.2. Draw upon key information sources and references essential to environmental health practice	A.1. (see above) A.3. Evaluate seminars and presentations in environmental health and distill the critical and salient issues from them. E.1. Prepare presentation materials including outlines, posters, and Powerpoint presentations. E.2. Deliver effective oral presentations individually and as part of a team.	A.1. (see above) E. 1. Gauge the cultural background, knowledge base and skills of an audience to appropriately customize communications for the target audience E.2. Organize and make oral presentations to professionals ranging from brief scientific presentations of research findings to longer presentations

Course grading: Essay "What is risk assessment?" (15%), Presentation 30 minutes (60%); 3 written questions per presentation (15%); class participation (10%).

Students are expected to give a thorough risk assessment review following the outline listed below (see Assignments). Students will be evaluated on the depth of the research performed as well as their ability to go beyond a simple review of the material and offer a critical evaluation of the topic. For example: Are current regulations adequate? Is the scientific evidence sound enough to support these regulations? ... And other similar questions.

Each powerpoint presentation should be sent to the rest of the class the morning of the day before class (Monday morning) so as to give time to the class to review the presentations. Each student will then write 2 to 3 questions on the topic which they will bring to class. The presentation and the questions will form the basis of our group discussion.

Assignments: Select an environmental toxicant for your presentation. Review the risk assessment documents on the EPA site (<http://www.epa.gov/iris>) and the scientific literature on an environmental agent that is a potential hazard. Prepare a professional quality Power Point presentation that contains the following:

1. Introduction of topic
2. Background on chemical structure and commercial uses,
3. Description of the toxicology at the molecular and pathological levels
4. Exposure of populations
5. Risk assessment
6. Replacement agents
7. Regulations
8. References

Other topics on the impact of an environmental exposure on health or ecology as well as presentation formats maybe selected by students with the consent of the instructor.

Recommended Reading

Science and Decisions: Advancing Risk Assessment, National Research Council, National Academies Press, Washington, D.C. 2009

		Name	Topic		
Sept 29			One page essay: "What is risk assessment?"		
Oct 6		Guest lecture: Dr Tim Malloy	Current challenges in R.A.: the case for A.A.		
Oct 13		Dr Patrick Allard	Risk Assessment and Management		
Oct 20	1	Amy Sen			
	2				
Oct 27	1	Wendy Greene			
	2				
Nov 3	1	Jenny			
	2	Cliff			
Nov 10	1	Jake			
	2	Jimmy			
Nov 17	1	Charlene			
	2				
Nov 24	1	Elaine			
	2				
Dec 1	1	Carlos			
	2				