



**Mel and Enid Zuckerman College of Public Health
University of Arizona**

**SYLLABUS
CPH 653 Applied Exposure Assessment
SPRING 2015**

Time: Tuesday and Thursday, 9:00-11:50 AM

Location: Drachman Hall A-116

Instructor: Paloma Beamer, PhD, pbeamer@email.arizona.edu

Office Hours: By appointment only. Time available will be Tuesday after class until 1 PM.

Co-Instructors: Melissa Valdez, mkvaldez@email.arizona.edu
(Teaching Assistants) Jong Sang Youn, jongsang@email.arizona.edu

Guest Lecturers: Steven Gravley, gravelys@email.arizona.edu
(Director of San Xavier Mine)

Rustin Reed, rustin2@email.arizona.edu
(Mine/Noise Consultant)

TA Office Hours: Tuesday and Thursday 11 AM - 1 PM

Catalog Description: Students learn processes to develop and implement a comprehensive strategy to anticipate recognize and evaluate environmental hazards. Course project involves practicum where students conduct a comprehensive hazard assessment and communicate findings.

Course Prerequisites: CPH 502 and CPH 584

Course Learning Objectives: Exposure assessment is a key step in determining risks of adverse health effects from environmental contaminants. Professionals performing hazard assessments rely on numerous skills, including: engineering to understand processes that introduce hazards, toxicology to recognize and identify potential health effects, and laboratory and modeling skills to monitor and quantify exposures. Investigations are also directed by regulations and consensus standards, and the ability to read and use these standards is critical to the success of an environmental and occupational health professional. Once obtained for a specific environment or operation, the hazard assessment information must be synthesized to communicate hazards and risks to the exposed population and management. Steps to control hazards that pose a risk must be identified and implemented.

The course incorporates the fundamental concepts learned in CPH 584 and CPH 502 and allows you to develop and implement a comprehensive strategy to anticipate, recognize, and assess hazardous exposures in the occupational environment. Although the course is focused on the occupational environment, these strategies could also be adapted to assess hazards and risks from community exposures and other settings in the environment. Lectures guide you through the steps required to complete a hazard assessment, and laboratories focus on the practical application of the lectures. The goal of this course is to provide a structured format for you to explore all aspects of investigating hazards and to provide the opportunity to apply methods in a real-world environment. You will get as much out of this course as you put into it.

At the end of this course, you will be able to:

- (1) identify resources to investigate environmental and occupational health hazards,
- (2) explain the hazard assessment process,
- (3) develop a monitoring strategy,
- (4) quantify exposures and risks
- (5) evaluate and communicate these risks, and
- (6) recommend follow-up action plans.

The tools learned and experience gained will help you not only conduct your own exposure assessment, but you will be able to assess the quality of hazard and exposure assessments of others.

Because this course is project-based, it will also develop competencies in:

- (1) oral communication
- (2) written communication,
- (3) decision-making, and
- (4) team-building

MPH/SECTION Competencies Covered:

Analytical Skills

- Defines a problem
- Determines appropriate uses and limitations of data
- Selects and defines variables relevant to defined public health problems
- Evaluates the integrity and comparability of data and identifies gaps in data sources
- Understanding basic research designs used in public health
- Makes relevant inferences from data

Communication Skills

- Communicates effectively in both writing and orally
- Interpreting and presenting accurately and effectively demographic, statistical, and scientific information for professional and lay audiences adapting and translating public health concepts to individuals and communities
- Soliciting input from individuals and organizations
- Leading and participating in groups to address specific issues, including ability to work in teams, span organizational boundaries, and cross systems

- Using all types of media to communicate important public health information

Policy Development/ Program Planning Skills

- Assess and interpret information to develop relevant policy options
- Translates policy into organizational plans, structures, and programs
- Identifying public health laws, regulations, and policies related to specific programs
- Developing mechanisms to monitor and evaluate programs for their effectiveness and quality

Cultural Skills

- Interacting competently, respectfully, and professionally with persons from diverse backgrounds
- Developing and adapting approaches to public health problems that take into account cultural differences

Basic Public Health Science Skills

- Understanding research methods in all basic public health sciences
- Applying the basic public health sciences including behavioral and social sciences, biostatistics, epidemiology, environmental public health, and prevention of chronic and infectious diseases and injuries

Financial Planning and Management Skills

- Developing and presenting a budget
- Managing programs with budgetary constraints
- Developing strategies for determining priorities
- Monitoring program
- Preparing proposals for funding from internal and external sources

Course Website: <http://d2l.arizona.edu>

Course Notes: Lecture notes will be provided on d2l. If they are not posted within 24 hours of the lecture meeting time, they will be distributed in class.

Recommended Texts/Readings: The recommended textbook for this course is below. It is available from the bookstore and AIHA at a discount for members.

Bullock, W.H. and J. Ignacio. (2006). A Strategy for Assessing and Managing Occupational Exposures. Third edition. AIHA Press: Fairfax, VA.

Course Requirements: Environmental and occupational health practitioners are required to apply fundamental knowledge of health hazards to interpreting site-specific hazards, prioritizing risks, and implementing controls. As such, assignments for this course are designed to evaluate your ability to think critically and use knowledge from this course and its prerequisites in a real-world situation. Your semester-long project is a hazard assessment of a real exposure scenario that a professional environmental health and occupational hygienist would face. These are real consulting projects, which need adequate evaluation for the University. They were not created just for the purpose of this course.

This course will consist of several assignments: equipment inventory, literature review presentation, walkthrough checklist, 2 site visit presentations, regulatory audit checklist, exposure calculations and hazard profile rankings, and laboratory assignments for data analysis, statistics, and exposure modeling. You will also submit a proposal and a final report including a presentation for your semester-long project.

Many of the assignments are interim designed to provide structured progress on your hazard assessment project throughout the semester. Feedback from these assignments should be addressed into the final report. The course is intended to build upon previous assignments and if you do not stay on schedule, performance on future assignments and labs will likely suffer

Grading/Student Evaluation: The grading system for this course is based on the following items. Grading criteria for each metric given with assignments.

Equipment Inventory:	(10)
Literature Review Presentation:	(25)
Site Visit Presentations (10 pts each)	(20)
Walkthrough Checklist	(10)
Regulatory Audit Checklist	(35)
Exposure Calculations and Hazard Rankings	(25)
Data Analysis Assignment	(25)
Statistics Assignment	(25)
Exposure Modeling Assignment	(25)
Proposal (Midterm)	(100)
Final Report (Final)	(200)
<u>Final Presentation</u>	<u>(100)</u>
Point total	600

****Note:** If class participation is lacking, instructor reserves the right to give quizzes at the beginning of the lesson as additional incentive to prepare for classes. If given, these quizzes will be worth an additional 10% of your grade.

Final grades will be based on the following relative point system:

- A = 90-100%
- B = 75-89%
- C = 65-74%
- E = < 65

Class Attendance/Participation: You are expected to attend class and participate by responding to rhetorical questions and in discussions, submit the assignments on time, and make presentations on the specified dates. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. Absences pre-approved by the UA Dean of Students (or Dean's designee will be honored.)

Course Schedule: See attached.

Required Statements:

Disability Accommodation: If you anticipate issues related to the format or requirements of this course, please meet with me. I would like us to discuss ways to ensure your full

participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Resources (621-3268; drc.arizona.edu) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations. The official policy can be found at: <http://catalog.arizona.edu/2012%2D13/policies/disability.htm>

Academic Integrity: All UA students are responsible for upholding the University of Arizona Code of Academic Integrity, available through the office of the Dean of Students and online: The official policy found at: <http://deanofstudents.arizona.edu/codeofacademicintegrity>

Classroom Behavior: The Dean of Students has set up expected standards for student behaviors and has defined and identified what is disruptive and threatening behavior. This information is available at: <http://deanofstudents.arizona.edu/disruptiveandthreateningstudentguidelines>

Students are expected to be familiar with the UA Policy on Disruptive and Threatening Student Behavior in an Instructional Setting found at: <http://policy.arizona.edu/disruptive-behavior-instructional> and the Policy on Threatening Behavior by Students found at: http://deanofstudents.arizona.edu/sites/deanofstudents.arizona.edu/files/Disruptive_threatening_behavior_bklt_2012.pdf

Grievance Policy: Should a student feel he or she has been treated unfairly, there are a number of resources available. With few exceptions, students should first attempt to resolve difficulties informally by bringing those concerns directly to the person responsible for the action, or with the student's graduate advisor, Assistant Dean for Student and Alumni Affairs, department head, or the immediate supervisor of the person responsible for the action. If the problem cannot be resolved informally, the student may file a formal grievance using the Graduate College Grievance Policy found at: <http://grad.arizona.edu/academics/policies/academic-policies/grievance-policy>

Grade Appeal Policy: <http://catalog.arizona.edu/2012-13/policies/gradappeal.htm>

Syllabus Changes: Information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate.

Communications: You are responsible for reading emails sent to your UA account from your professor and the announcements that are placed on the course web site. Information about readings, news events, your grades, assignments and other course related topics will be communicated to you with these electronic methods. The official policy can be found at: <http://www.registrar.arizona.edu/emailpolicy.htm>. You should also check the d2i website frequently for updates and announcements. Consider setting your account in d2i to forward all messages to your UA email account. They are not automatically linked.

Assignment Guidelines: For assignments to receive full credit they must be legible, and you must state all of your assumptions and show all work, including sample calculations for every type of calculation in a spreadsheet as necessary. If a problem specifies units, those specified units must be used, and if a problem asks for a table or graph, you must create the requested table or graph. You can discuss your results, problems, methods with each other, but each problem set write-up should be completed individually.

Late Assignment and Make-up Policy: All assignments must be submitted in hard copy format to be graded. Assignments should be submitted by 5:00 pm on the due date, unless it is a presentation and then it is due in class. Any late assignments will be graded down 10% per day (including weekends) that it is late. An assignment is considered one day late if it is submitted after 5:00 pm on the due date. There will be no make-ups for class presentations, proposal or final report.

Plagiarism: What counts as plagiarism?

- Copying and pasting information from a web site or another source, and then revising it so that it sounds like your original idea.
- Doing an assignment/essay/take home test with a friend and then handing in separate assignments that contain the same ideas, language, phrases, etc.
- Quoting a passage without quotation marks or citations, so that it looks like your own.
- Paraphrasing a passage without citing it, so that it looks like your own.
- Hiring another person to do your work for you, or purchasing a paper through any of the on- or off-line sources.

Course Schedule: Chapters under readings refer to the AIHA Book. Additional readings are on d2l.***

Date	Topic	Reading	Assignment Due
January 15	Lab: Introduction, Exposure Assessment, Inventory	Chapter 1	
January 20	Lect: Fundamentals of Hazard Assessment	Chapter 1 and 2	
January 22	Lab: Site Investigations, Inventory	Chapter 3 and 4 Case Study: Industrial Hygiene Assessment at the NCAR/UCAR Mesa Laboratory	
January 27	Lect: Site Descriptions, Literature Review		Equipment Inventory
January 29	Lect: Regulatory Considerations	Example Audit: Chemical Protective Clothing	
February 3	Lect: <u>Literature Review Presentations</u>		Walkthrough Checklist
February 5	<i>Lab: Site Visit #1</i>		
February 10	Lect: Hazard Ranking	Chapter 5 and 6 Case Study: Control Technology and Exposure Assessment for Electronic Recycling Operations Elkton Federal Correctional Institution	
February 12	Lab: Project meetings, <u>Present Site Visit #1</u>		
February 17	Lect: Exposure Calculations	Ch. 6, 25 App. I and II	Regulatory Audit Checklist
February 19	<i>Lab: Site Visit #2</i>		
February 24	Lect: Development of Sampling Plan and Budgets	Chapter 6, 7, (11-16)	
February 26	Lect: Project meetings, <u>Present Site Visit #2 and Proposal</u>		Expo. Calcs and Hazard Rank
March 3	Lect: Evaluation of Controls	Chapter 22, 24	Proposal
March 5	Lect: Recordkeeping and Reassessment	Chapter 8 and 9	
March 10	<i>Lab: Data Collection</i>		
March 12	<i>Lab: Data Collection</i>		
March 17	Spring Break ☺		

March 19	Spring Break ☺		
March 24	<i>Lab: Data Collection</i>		
March 26	<i>Lab: Data Collection</i>		
March 31	Lect: Statistics	Ch. 7, Appe. III-VI	
April 2	Lab: Statistics	Case Study: Children's Blood Lead Levels	
April 7	Lect: Data Analysis	Ch. 7, Appendix VIII	Data Collection
April 9	Lab: Data Analysis	Case Study: National Human Exposure Assessment Study	Statistics Assign.
April 14	Lect: Stochastic Exposure Modeling	Appendix I	
April 16	Lab: Exposure Modeling	ConsExpo Manual*** Case Study: Phthalates in Toys	
April 21	Lab: Project Meetings		
April 23	Lect: Communications and Report Expectations	TBA***	Modeling Assignment
April 28	Lect: Project Meetings		
April 30	Lab: <u>In-Class Presentations</u>		
May 5	Lect: Peer Review		First Draft Due
May 1-May 7	Present to sites		
May 12	Final Report Due @ 10 am		Project Report

*Underlined presentations (2/3, 2/12, 2/26, 4/30) are provided by students. You should come to class prepared. Otherwise there will be nothing to do.

** Labs in italics (2/5, 2/19, 3/10, 3/12, 3/24, and 3/26) will actually be held on Saturdays at the mine. There are *no class* meetings on these days, but that doesn't mean you have nothing to do! This means that we are not meeting for those **18 hours**. These "avoided lecture times" are meant to allow you to spend an equivalent of 18 (minimum) to **54** (expected) **hours IN THE FIELD** as the applied experience. This should include not only gathering your data, but preparing for the field. For example, preparing data sheets and calibrating equipment should be completed prior to going to the mine to collect data. **DO NOT** try to get away with spending only 3 hours to collect your data for the report: *I will know this and your grade will reflect your workload*. In the time allotted, you should be able to get *repeat* measurements in order to allow for statistical analysis of your data, which is expected in the final report. You should plan on being at the mine all day on 2/7, 2/21, 3/7, 3/28, 4/4.