CONCENTRATION COURSE FACULTY

Paloma Beamer, PhD
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GUEST LECTURERS

Brenda Granillo, MS, Director, Mt West Preparedness and Emergency Response Learning Center
Will Humble, MPH, ADHS
Jeff Sandstrom Radiation Control, U of A

DR. REYNOLDS’ OFFICE HOURS: by appointment. The best way to get in touch with me is via email. Please allow up to 48 hours response time.

TEACHING ASSISTANT: Natalie Daranyi, ndaranyi@email.arizona.edu

TA OFFICE HOURS: by appointment.

CATALOG/COURSE DESCRIPTION: Course emphasizes health hazard sources, methods to identify & evaluate them, and framework used to affect hazard control. Students will evaluate public health issues, understand research designs, identify and evaluate factors important to the development of monitoring programs.

COURSE PREREQUISITES: Recommended background reading in Epidemiology and Biostatistics. Need Epi Background? Read Chapter 3

COURSE LEARNING OBJECTIVES: At the end of this course, students will be able to:

1. Specify approaches for assessing, preventing and controlling environmental hazards that pose risks to human health and safety.
2. Describe the direct and indirect human, ecological and safety effects of major environmental and occupational agents.
4. Describe genetic, physiologic and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards.
5. Discuss various risk management and risk communication approaches in relation to issues of environmental justice and equity.
6. Explain the general mechanisms of toxicity following various environmental exposures.
7. Develop a testable model of environmental insult.
8. Describe federal and state regulatory programs, guidelines and authorities that control environmental health issues.

**MPH Competencies Addressed:**

<table>
<thead>
<tr>
<th>A. ANALYTICAL SKILLS:</th>
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<tbody>
<tr>
<td>A-1. Defines a problem</td>
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<td>A-2. Determines appropriate uses and limitations of data</td>
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<td>A-3. Selects and defines variables relevant to defined public health problems</td>
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<td>A-4. Evaluates the integrity and comparability of data and identifies gaps in data sources</td>
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<td>A-5. Understands how the data illuminates ethical, political, scientific, economic, and overall public health issues</td>
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<tr>
<td>A-6. Understanding basic research designs used in public health</td>
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<td>A-7. Makes relevant inferences from data</td>
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<tr>
<th>B. COMMUNICATION SKILLS:</th>
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<tr>
<td>B-1. Communicates effectively both in writing and orally (unless a handicap/online setting precludes one of those forms of communication)</td>
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<tr>
<td>B-2. 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</td>
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<td>B-3. Soliciting input from individuals and organizations</td>
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<td>B-4. Advocating and marketing for public health programs and resources, including political lobbying, grant writing, collaboration building, and networking</td>
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<td>B-5. Leading and participating in groups to address specific issues, including ability to work in teams, span organizational boundaries, and cross systems</td>
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<td>B-6. Using all types of media to communicate important public health information</td>
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<td>B-7. Demonstrating cultural competency in all of the above and community development</td>
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<tr>
<th>C. POLICY DEVELOPMENT SKILLS:</th>
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<tr>
<td>C-3. Articulating the health, fiscal, administrative, legal, social, political, and ethical implications of each policy option</td>
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<td>C-6. Identifying public health laws, regulations, and policies related to specific programs</td>
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<td>C-7. Developing mechanisms</td>
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<th>D. CULTURAL SKILLS:</th>
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<tr>
<td>D-1. Understanding the current forces contributing to cultural diversity in the Southwest</td>
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<tr>
<td>D-2. Interacting competently, respectively, and professionally with persons from diverse backgrounds</td>
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<tr>
<td>D-3. Identifying and examining the role of cultural, social, ethnic, religious, spiritual, and behavioral factors in determining disease prevention health promoting behavior, and health service organizational and delivery</td>
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<td>D-4. Developing and adapting approaches to public health problems that take into account cultural differences</td>
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<tr>
<td>D-5. Determining health related consequences of social structure</td>
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<tr>
<td>D-6. Understands the dynamic forces contributing to cultural diversity</td>
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E. BASIC PUBLIC HEALTH SCIENCE SKILLS:

E-1. Defining, assessing, and understanding the health status of population, determinants of health and illness, factors contributing to health promotion and disease prevention, and factors influencing the use of health services

E-2. Understanding research methods in all basic public health sciences

E-3. Applying the basic public health sciences including behavioral and social sciences, biostatistics, epidemiology, environmental health, and prevention of chronic and infectious diseases and injuries

Course Notes: You are expected to take your own notes in class using paper and pencil. Computers, phones, pads and other electronic devise use are not allowed during class lecture time but may use computers when directed for class specific activities. Class lecture material will be posted on D2L following the class. Some instructors may post additional content or distribute printed material in class at their discretion. These materials will be posted on the D2L site under the appropriate lecture.

Text/Readings: Frumkin, Howard (Ed).  *Environmental Health: From Global to Local*. Josey-Bass, 2010 (second edition).  Additional reading material will be posted on D2L. An electronic version of the text is available to no more than three consecutive users. To access the eVersion, see the following link: http://sabio.library.arizona.edu/record=b6916117~S9

Course Requirements: You are expected to read the assigned chapters before class, respond to questions in class, submit homework and assignments on time, take exams on the specified dates, coordinate research and presentation tasks with your assigned group and successfully complete any work given during scheduled classes. Changes and other information about the class will be mailed to your University of Arizona e-mail address through D2L. It is your responsibility to forward or check this e-mail.

The point allocation/grading scheme follows:

<table>
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<tr>
<th>Task</th>
<th>Potential Points</th>
<th>Grades Awarded</th>
<th>Accumulated Point Range for Grade</th>
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<tbody>
<tr>
<td>Initial Self-Evaluation</td>
<td>25</td>
<td>A</td>
<td>&gt;494</td>
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<tr>
<td>3 Exams @ 100 points each</td>
<td>300</td>
<td>B</td>
<td>439 to &lt;494</td>
</tr>
<tr>
<td>8 Class reflections @ 8 points</td>
<td>64</td>
<td>C</td>
<td>384 to &lt;439</td>
</tr>
<tr>
<td>Presentation proposal</td>
<td>25</td>
<td>D</td>
<td>329 to &lt;384</td>
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<tr>
<td>Presentation outline</td>
<td>30</td>
<td>E</td>
<td>&lt;329</td>
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<tr>
<td>Presentation (oral &amp; questions: 25 points)</td>
<td>80</td>
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<tr>
<td>Wrap-up Self-Evaluation</td>
<td>25</td>
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<tr>
<td><strong>Total points</strong></td>
<td><strong>549</strong></td>
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Due Dates for assignments are designated on the syllabus. Do not rely on dropbox dates and times. These are sometimes inaccurate. All late assignments will be penalized 10% per day. There is no extra credit for this graduate course. There is no make up for missed in-class reflections but you may drop the two lowest scores.

Examinations: Students will be expected to demonstrate that they have met the course objectives through homework assignments and examinations. Three exams will be given (2 semester exams and 1 non-cumulative final including student presentation information). Exams will consist of multiple choice, short answer questions and short essay questions. Some exams may include self-evaluations or take-home questions with designated due dates listed on the assignment. It is your responsibility to clear your calendar and take the exam at the scheduled time and place. Reflections are designed to expand awareness of environmental health as it relates to that day’s reading assignment and class material;
there are no make-up reflections for any reason—don’t ask. Except for emergency situations (e.g., medical, supported by appropriate documentation), make-up exams will not be given and zero credit will be awarded for missed exams.

Project/Presentation: The three components of the presentation exceed the points of one exam. Select a topic related to environmental or occupational health of interest to you. Make sure your topic has a quantitative assessment component. Research the topic and schedule an appointment to discuss the topic with the TA and instructor (see syllabus details for dates). The schedule sheet will be circulated on the first day of class and then posted on the door of Room A233. If you sign up after the first day of class, be sure to confirm your meeting time. The same procedure will be used to schedule for outline/preliminary presentation review in late March. Appointments are allocated on a first come, first served, basis. Following the outline/presentation review, adjustments should be made prior to class presentation. Grades will be derived from evaluations by peers, faculty and graduate students. (Grading rubric will be provided at the time of outline/presentation preliminary review). Instructions for presentation development will be posted on D2L.

Self-Evaluations: Prior to undertaking a new educational opportunity, it is useful to perform a personal assessment of what you know about the topic. The goal is to learn more though personal investment throughout the semester. At the end of the course it is useful to look at what you learned and assess personal progress. To encourage this behavior, 25 points are awarded for both the initial and final personal assessment. These assessments are listed under “Quizzes”/Surveys in D2L. Due dates are listed in the course schedule below.

Class Attendance/Participation: Students are expected to attend every class meeting and participate in discussions. Students are expected to be present for every class. 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.

Additional Information:

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

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/2015%2D16/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: (Statement of expected behavior and respectful exchange of ideas) 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/education-and-student-affairs/disruptive-behavior-instructional-setting

and the Policy on Threatening Behavior by Students found at:
http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students

**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/2015-16/policies/gradappeal.htm](http://catalog.arizona.edu/2015-16/policies/gradappeal.htm)

**UA Smoking and Tobacco Policy:**
The purpose of this Policy is to establish the University of Arizona’s (University) commitment to protect the health of University faculty, staff, students, and visitors on its campuses and in its vehicles. The latest version of the policy is available at:
http://policy.arizona.edu/ethics-and-conduct/smoking-and-tobacco-policy

**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.

**Telephone and Computer Use:** You are not allowed to have your computer on during class lectures unless instructed to do so— or to use any other electronic devices.

**Plagiarism:** It is not ALL about citation! 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.

Identified cases of plagiarism will be referred to the Dean of Students as an academic violation and a 0 grade will be awarded for the assignment. You may be expelled for violations of the code of conduct and this is one such violation.

**Course Schedule:**

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<thead>
<tr>
<th>Date</th>
<th>Topic &amp; Lecture Objectives</th>
<th>TEXT CHAPTER</th>
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<tbody>
<tr>
<td>Jan 14</td>
<td>1. Syllabus, Presentation, concepts, paradigms and ethics (Reynolds)</td>
<td>Intro, 7, 8 (1, 5)</td>
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<td>1. Review syllabus and clarify expectations</td>
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</table>
2. Understand introductory material
3. Ethics and Public Health

Jan 21 2. Toxicology (Burgess) 2, 6, 17
1. Understand toxicokinetics, dose-response relationships and toxicity terminology.
2. Give examples of organ specific toxicity with representative toxicants.
3. Identify sources of variation in individual susceptibility to toxicants.
4. Explain how current regulatory limits are developed

Initial Self-Evaluation due Jan 22

Jan 28 3. Occupational and environmental health (Griffin) 4, 20 (27, 32)
1. Explain the history of occupational and environmental health and pertinent regulations.
2. Describe the worker’s compensation system.
3. Explain the role of industrial hygiene in worker health and safety.

Project Assignment: Sign up for a topic and meet with Instructor/TA prior to February 12.

Feb 4 4. Risk assessment (Burgess, Humble) 29, 31
1. Introduction to risk assessment
2. Describe how risk assessments are carried out.
3. Consider the role of environmental toxicants in disease clusters.
4. Describe risk communication principles

Feb 11 5. Exam I (4:00-5:15 PM)

Feb 18 6. Recreational water, soils, food and emerging infections (Reynolds) 18, Suppl. D2L
1. Understand the role of environmental waste management on drinking and recreational water quality.
2. Identify the public health risk of recreational waterborne exposures.
3. Describe the physical-chemical characteristics of soil
4. Understand the relationship between soil characteristics and contaminant transport/fate
5. Discuss methods of analysis for basic soil properties
6. Evaluate tools for assessing geographical information related to environmental/ecological health

Feb 25* 7. Water and waste water (Reynolds) 15 (16, 30) Suppl. D2L
1. Be able to discuss water cycle, availability and quality.
2. Given global climate change, discuss the likelihood of sufficient water in our region
3. Discuss strategies of maintaining water quality
4. Describe methods of sewage treatment in municipal, suburban and rural systems
5. Discuss toilet to tap water delivery in terms of water quality, sustainability

Mar 3 8. Pediatric environmental health (4:00 to 5:15 PM) (Beamer) 25, Suppl. D2L
1. Specify differences between children and adults in activity, physiology and other factors that affect their exposure to environmental hazards
2. Be able to conduct an environmental history and home inventory
3. Identify, prevent and control environmental hazards with respect to children
4. Discuss how other factors including socioeconomic status and obesity may contribute to increased risk

Computational Modeling and Simulation (5:30 to 6:45 PM) (Canales)
1. Describe what is meant by computational modeling and how applications may be useful in environmental health
2. Describe how concepts in probability, statistics, mathematics, environmental science, and behavioral sciences are incorporated in simulations
3. Define the terms uncertainty, variability and sensitivity in computational models
4. Understand how simulation results are presented

Presentation Review: Sign up for review and meet with Instructor/TA prior to March 25. Bring draft.

Mar 10 9. Virus, vectors and disease (4:00-5:15 PM) (Sexton) 10, 17
1. Examine historical outbreaks
2. Understand the basic dynamics of vector-borne disease
3. Examine the links between climate/climate change and vector borne disease
4. Evaluate emerging infectious diseases
5. Discuss potential strategies to predict and mitigate future outbreaks

Exam II (5:30-6:50 PM)

Mar 17 ****UA Spring Break- no class****

Mar 24 10. Preparedness (Granillo/Verhougstraete) 11, 22, 23
1. Specify approaches for assessing, preventing and controlling hazards that pose risks to human health and safety during a manmade or natural disaster.
2. Describe the direct and indirect human, ecological and safety considerations of major environmental, biological, chemical, and radiological agents encountered in a disaster.
3. Describe federal and state preparedness and response guidelines
4. Discuss various risk assessment and control approaches in relation to disasters and illnesses

Mar 31 11. Energy, transportation and urbanization (O’Rourke) 13, 14
1. Identify energy resources and the pollutant yield from each source.
2. Identify current energy sources and anticipate the rate and consequence of their expenditure.
3. Anticipate and recognize the impacts of population expansion and migration on communities and their resources,
4. Identify management and control strategies addressing the impacts of population expansion and migration on human health,
5. Examine transportation needs and impacts
6. Examine relationship between urbanization and transportation while considering impacts on health

Submit Presentation to the D2L Drop Box by April 11.

Apr 7 12. Ambient and indoor air quality (O’Rourke) 12, 19
1. Anticipate pollutant generation and dispersal
2. Understand how to control and manage air pollution
3. Integrate and discuss population pressure, urbanization, transportation, energy availability, weather, climate and their collective impact on air quality and health
4. Realize each pollutant behaves differently. Discuss diurnal, temporal and annual variability for individual criteria pollutants
5. Evaluate duration of exposure differences between indoor and outdoor air
6. Identify and evaluate dominant indoor air pollutants and compare with outdoor - Ventilation
7. Consider the different types of contaminants found in indoor environments vs. ambient air
8. Identify ways to control indoor contaminant

Apr 14 15. Climate change, population pressure and sustainability (O'Rourke) 9, 10
1. Understand drivers of climate change and impacts of air, land & sea
2. Determine control or mitigation approaches that could be employed.
3. Examine the impact of population pressure and resource use on climate change.
4. Examine the impact of declining energy, population pressure, changing climate on outcomes that may be social warfare or active military action

Apr 21 13. Presentations Group 1

Apr 28 16. Presentations Group 2

**Final Self-Evaluation due May 4**

FINAL EXAM- Wednesday May 11, 6-8 pm Drachman Hall A118.