Time: Thursday, 1:00-3:50 pm
Location: Drachman Hall, Room A116

Instructor/Course Coordinator: Kelly A. Reynolds, PhD
MEZCOPH/CEP
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Email: reynolds@email.arizona.edu

On-Site Course Faculty
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Jeff Burgess, MD, MS, MPH 626-4918  jburgess@email.arizona.edu

Guest Lecturers
Will Humble, MPH, ADHS
Wayne Peate, MD, MPH
Kacey Ernst, PhD, Epidemiology, U of A
Rich Wagner, Radiation Control, U of A

Office Hours: By appointment. The best way to get in touch with us is via email.

Teaching Assistant: Laura Suppes, MPH, suppeslm@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

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 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
- Understands how the data illuminates ethical, political, scientific, economic, and overall public health issues
- Understanding basic research designs used in public health
- Makes relevant inferences from data

### COMMUNICATION SKILLS:
- Communicates effectively both in writing and orally (unless a handicap precludes one of those forms of communication)
- 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
- Advocating and marketing for public health programs and resources, including political lobbying, grant writing, collaboration building, and networking
- 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
- Demonstrating cultural competency in all of the above and community development

### BASIC PUBLIC HEALTH SCIENCE SKILLS:
- 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
- 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
- Understanding of the historical development and structure of state, local, and federal public health agencies

### CULTURAL SKILLS:
- Understanding the current forces contributing to cultural diversity in the Southwest
- Interacting competently, respectively, and professionally with persons from diverse backgrounds
- 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
- Developing and adapting approaches to public health problems that take into account cultural differences
- Determining health related consequences of social structure
- Understands the dynamic forces contributing to cultural diversity
Course Notes: You are expected to take your own notes in class. Whenever possible, handouts are posted 1 week in advance on the course D2L website. Some instructors may post additional content after class or distribute printed material in class at their discretion and students are responsible for collecting the material at that time. Have someone pick up a copy for you if you are not present in class.


Course Requirements: You are expected to respond to questions, 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 unscheduled quizzes given during scheduled classes. You must have a University of Arizona e-mail address. Check your e-mail frequently.

The point allocation/grading scheme is as follows:

<table>
<thead>
<tr>
<th>Task</th>
<th>Potential Points</th>
<th>~% of Grade</th>
<th>Grades Awarded</th>
<th>Accumulated Point Range for Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Exams @ 100 points each</td>
<td>300</td>
<td>67%</td>
<td>A</td>
<td>&gt;405</td>
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<tr>
<td>12 Quizzes at 5 points each</td>
<td>55</td>
<td>13%</td>
<td>B</td>
<td>356 to &lt;405</td>
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<td>(drop lowest score)</td>
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<tr>
<td>2 homework assignments @ 15 points each</td>
<td>30</td>
<td>7%</td>
<td>C</td>
<td>289 to &lt;360</td>
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<tr>
<td>Group presentation</td>
<td>60</td>
<td>13%</td>
<td>E</td>
<td>&lt;289</td>
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<tr>
<td><strong>Total points</strong></td>
<td><strong>445</strong></td>
<td><strong>100%</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.

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 midterm exams and 1 non cumulative final). 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. 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 the exam.

Class Attendance/Participation: You are expected to attend class and participate. 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: Need Epi Background? Read Chapter 3

<table>
<thead>
<tr>
<th>WEEK</th>
<th>Topic &amp; Lecture Objectives</th>
<th>TEXT CHAPTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 23</td>
<td>Syllabus, concepts, paradigms and ethics (Burgess)</td>
<td>Intro, 7, 8 (1, 5)</td>
</tr>
<tr>
<td>1.</td>
<td>Review syllabus and clarify expectations</td>
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<tr>
<td>2.</td>
<td>Understand introductory material</td>
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<tr>
<td>3.</td>
<td>Ethics and Public Health</td>
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<td></td>
<td>Identify work groups and choose presentation topic</td>
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<tr>
<td>Aug. 30</td>
<td>Toxicology (Burgess)</td>
<td>2, 6, 17</td>
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<tr>
<td>1.</td>
<td>Understand toxicokinetics, dose-response relationships and toxicity terminology.</td>
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<tr>
<td>2.</td>
<td>Give examples of organ specific toxicity with representative toxicants.</td>
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<td>3.</td>
<td>Identify sources of variation in individual susceptibility to toxicants.</td>
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<td>4.</td>
<td>Explain how current regulatory limits are developed</td>
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<tr>
<td>Sept. 6</td>
<td>Risk assessment (Burgess, Humble)</td>
<td>29, 31</td>
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<tr>
<td>1.</td>
<td>Introduction to risk assessment</td>
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<td>2.</td>
<td>Describe how risk assessments are carried out.</td>
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<td>3.</td>
<td>Consider the role of environmental toxicants in disease clusters.</td>
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<td>4.</td>
<td>Describe risk communication principles</td>
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<tr>
<td>Sept. 13</td>
<td>Occupational and environmental health (Burgess, Lutz)</td>
<td>4, 20 (27, 32)</td>
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<tr>
<td>1.</td>
<td>Explain the history of occupational and environmental health and pertinent regulations.</td>
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<td>2.</td>
<td>Describe the worker's compensation system.</td>
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<td>3.</td>
<td>Explain the role of industrial hygiene in worker health and safety.</td>
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<tr>
<td>Sept. 20</td>
<td>Exam I (1:00-2:15 PM)</td>
<td>11, 14</td>
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<td>Global health (2:30 to 3:50 PM) (Loh)</td>
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<tr>
<td>1.</td>
<td>Describe the characteristics and drivers of the demographic, epidemiologic, and environmental risk transitions in countries or regions at different stages of development.</td>
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<td>2.</td>
<td>Identify some of the transnational environmental health risks we face in the world today and describe their drivers.</td>
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<td>3.</td>
<td>Consider the potential for interaction between multiple environmental factors and social/community factors in the urban environment when thinking about health risks.</td>
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<tr>
<td>Sept. 27</td>
<td>Energy, transportation and urbanization (Scanlon &amp; O'Rourke)</td>
<td>13</td>
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<tr>
<td>1.</td>
<td>Identify energy resources and the pollutant yield from each source.</td>
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<tr>
<td>2.</td>
<td>Identify current energy sources and anticipate the rate and consequence of their expenditure.</td>
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<td>3.</td>
<td>Anticipate and recognize the impacts of population expansion and migration on communities and their resources.</td>
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<tr>
<td>4.</td>
<td>Identify management and control strategies addressing the impacts of population expansion and migration on human health.</td>
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<td>5.</td>
<td>Examine transportation needs and impacts</td>
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<td>6.</td>
<td>Examine relationship between urbanization and transportation while considering impacts on health</td>
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O'Rourke Homework Instructions for presentation on October 11
Oct. 4 7. Ambient and indoor air quality (O’Rourke)  
   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

Oct. 11 8. Climate change, population pressure and sustainability (O’Rourke and Class) 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

Oct. 18 9. Exam II (1:00-2:15 PM)  
Virus, vectors and disease (Ernst)  
   1. Understand the basic dynamics of vector-borne disease  
   2. Examine the links between climate/climate change and vector borne disease  
   3. Examine the relative projected impact of climate change on malaria and dengue  
   4. Discuss potential strategies to mitigate transmission

Oct. 25 10. Radiation (Wagner) 21  
   1. Describe Radiation Fundamentals  
   2. Identify sources and health effects of radiation exposure  
   3. Understand regulatory aspects of radiation and methods to control exposure

Nov. 1 11. 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

Receive instructions for homework #1 (due Nov. 8)

Nov. 8 12. Pediatric environmental health (1:00 to 2:20 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  
Preparedness, war and injury (Peate) 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 effects of major environmental, biological, chemical, and radiological agents encountered in a disaster.
3. Describe federal and state programs, guidelines, incident command systems and authorities that respond to disasters.
4. Discuss various risk assessment and control approaches in relation to injuries

Nov. 15 13. Recreational water/soils & food/emerging infections (Reynolds, Suppes) 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

Group presentations (2-3)

Nov. 22 Thanksgiving Holiday- no university classes

Nov. 29 14. Group presentations (4-5)

Course evaluation

FINAL EXAM- Monday, Dec. 10, 2012 1 pm to 3 pm

Communications: You are responsible for reading emails sent to your UA account from your professor and the announcements or D2L email 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/2011%2D12/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 is found at: http://deanofstudents.arizona.edu/codeofacademicintegrity

Consequences for any type of academic misconduct may result in a grade of zero for assignment, or a failing grade for the course.

Pay special attention to the sections on plagiarism.

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.

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 Behavior in an Instructional Setting found at http://web.arizona.edu/~policy/distruptive.pdf and the Policy on Threatening Behavior by Students found at http://web.arizona.edu/~policy/threatening.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/2011-12/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.

Telephone and Computer Use: You may use your computer in class for accessing course related content. Other uses of the computer during class are distracting to fellow students and lecturers and will not be permitted. Likewise, cell phones should be set to silent or vibrate in order to not disrupt the class and disturb your fellow students and professor.