Meeting Information:
Meeting dates: 01/13/2021 - 05/05/2021
Meeting days: Thursday
Meeting times: 04:00 PM - 06:50 PM
Room: Live online
Instruction mode: Live online due to current COVID restrictions:

https://arizona.zoom.us/j/85298853792?pwd=TIBCamFNNjJZV0hLeGxXTjJzYWpSUT09

Instructor/Course Coordinator: Kelly A. Reynolds, Ph.D.
MEZCOPH/CEP
Office: Drachman Hall, Room A235
Email: reynolds@email.arizona.edu

Concentration Course Faculty
Jeff Burgess, MD, MS, MPH
Melissa Furlong, PhD
Stephanie Griffin, PhD, CIH
Chris Lim, PhD
Mary Kay O’Rourke, PhD
Jonathan Sexton, PhD

E-mail address
jburgess@email.arizona.edu
mfurlong@email.arizona.edu
scgriffin@email.arizona.edu
chrislim@email.arizona.edu
mkor@email.arizona.edu
sextonj@email.arizona.edu

Guest Lecturers
Mona Arora, MSPH U of A MEZCOPH
Will Humble, MPH, UAHS Center for Population Science & Discovery
John Hanlin, Ecolab, Eagan, MN

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: Yoonhee Jung, yoonheej@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 4
Course Objectives and Expected Learning Outcomes: During this course, students will:

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.

Learning Outcomes (Competencies Obtained): Upon completion of this course students will be able to:

Program Competencies Covered (MPH Program level):

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
   Student reflections are assessed on their use of quantifying exposures.
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
   Students are assessed on how they select data to determine workplace contaminants through in class exercises and reflections.
4. Interpret results of data analysis for public health research, policy or practice
   Students are assessed on how they interpret exposure data from reflections and final project presentations.
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
   Student exams and reflections are assessed on how they address issues related to environmental justice, and the cumulative effect of environmental hazards in vulnerable populations.
10. Explain basic principles and tools of budget and resource management
    Students are assessed on how they understand resource management tools from reflections and in class assignments.
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
    Students reflections are assessed on how history and policies related to environmental health.
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
    Students homework is assessed on how the strategies used to identify stakeholders regarding workplace contaminants.
16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
    Student assignments are assessed on how they communicate the risk-risk tradeoffs and their reflections on leadership and team investigations.
20. Describe the importance of cultural competence in communicating public health content
    Students are evaluated on how incorporate cultural competence in reflections on environmental justice and team investigations.
22. Apply systems thinking tools to a public health issue
Students’ reflections are assessed on systems thinking and the paradox of sustainability.

Concentration Competencies Covered (MPH):
3. Identify control methods for reducing worker or public exposures to acceptable levels.
   An initial assignment is assessed on students to identify control methods for workplace contaminants, exposure and health. A reflection within the Occupational and environmental health module is used to assess how students identify Work, Health, and Well-Being & Injuries; as well as a reflection on Prevention within the same module.
4. Describe factors which influence the behavior of aerosols and their ultimate fate including deposition in the respiratory system.
   Students are assessed using a quiz on Air Pollution & Buildings and Health within the same named module.

Course Notes: You are expected to take your own notes in class. Computers, phones, pads and other electronic devise may only be used during class lecture time for class related activities. We may use computers 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: Environmental Health: From Global to Local, 3rd Edition (2016) by Howard Frumkin (Editor). Additional material may be posted on D2L. A physical copy of the 3rd edition can be purchased from the medical bookstore or online retailers. An online electronic version is available through the University library. Make sure you have the 3rd edition, as chapter numbers and pages will differ between editions. The direct ebook link is: https://ebookcentral.proquest.com/lib/uaz/detail.action?docID=4405576.

Course Requirements: You are expected to read the assigned chapters before class, respond to questions during 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>
<thead>
<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>
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<tr>
<td>8/9+ Class reflections @ 8 points*</td>
<td>64</td>
<td>C</td>
<td>384 to &lt;439</td>
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<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>25</td>
<td>E</td>
<td>&lt;329</td>
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<tr>
<td>Presentation draft</td>
<td>25</td>
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<tr>
<td>Presentation (oral delivery &amp; questions: 20 points)</td>
<td>60</td>
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<tr>
<td>Wrap-up Self-Evaluation</td>
<td>25</td>
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<td><strong>Total points</strong></td>
<td><strong>549</strong></td>
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*lowest scores beyond 8 reflections will be dropped.

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 lowest score.
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 (i.e., to be completed outside of class time) 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. 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. 10 points on each exam will be awarded based on in-class participation (see more details below).

Participation: It is important that you actively engage during course lectures. The best way to do this is to be present during the entire lecture, with your video camera on, ask questions and respond to questions from the speakers, and participate in class exercises and discussion groups. Participation points will be deducted from the originally allotted 10 pts, to be scored on the next exam.

Project/Presentation: The four 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 submit prior to the deadline for instructor review (see syllabus details for dates). The same procedure will be used to schedule for outline/preliminary presentation review in late March. Following the outline/presentation review, adjustments should be made prior to the draft and live presentation due dates. Presentations may be delivered via live in-person, live Zoom, or recorded modalities. The delivery mode should be approved by the instructor in advance. 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 through 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. Video cameras should be on during live Zoom sessions for all attendees. 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. Students who need to miss a class, or series of classes, due to illness or the need to quarantine/isolate are responsible for emailing their course instructor, with copy to the Dean of Students, to let them know of the need, as soon as possible. There is no need for a medical excuse to be provided for absence of up to one week. Students are responsible for completing any work that they might miss due to illness or the need to quarantine/isolate, including assignments, quizzes, tests and exams. Non-attendance for any reason does not guarantee an automatic extension of due date or rescheduling of examinations. Students who need to miss more than one week of classes in any one semester will be required to provide a doctor’s note of explanation to the Dean of Students.

Additional Information:
Communications: You are responsible for reading emails sent to your UA account from your instructor 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: https://www.registrar.arizona.edu/personal-information/official-student-email-policy-use-email-official-corrresponse-students

Accessibility and Accommodations: At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience barriers based on disability or pregnancy, please contact the Disability Resource Center (520-621-3268, https://drc.arizona.edu) to establish reasonable accommodations. If our class meets at a campus location: Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Code of Academic Integrity
Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercise must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity, available through the office of the UA Dean Students: http://deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity

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 campuses and in its vehicles. The official policy can be found at: http://policy.arizona.edu/ethics-and-conduct/smoking-and-tobacco-policy

University Course Policies: (please see the following URL):
https://academicaffairs.arizona.edu/syllabus-policies

Phone and Computer Use: You may use your computer or other electronic devices during class purposes only. Email, shopping or working on other course assignments are disruptive to lecturers and other students and thus not allowed.

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 offline 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:
In lieu of “Spring Break”, the University of Arizona has designated that the following days will be Reading Days and will be an opportunity for students and instructors to take a reprieve during the academic term:
- Thursday, February 25, 2021
- Tuesday, March 9, 2021 (original spring break week)
- Wednesday, March 10, 2021 (original spring break week)
- Friday, April 2, 2021
- Wednesday, April 21, 2021

<table>
<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. Course introduction, paradigms and ethics (Reynolds)</td>
<td>1, 10</td>
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<tr>
<td></td>
<td>1. Understand introductory/syllabus material</td>
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<td>2. Self-evaluation</td>
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<td>3. Ethics and Public Health</td>
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<td>4. Project topic discussion</td>
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<td>Jan 21</td>
<td>2. Toxicology (Burgess)</td>
<td>6, 7</td>
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<td>1. Understand toxicokinetics, dose-response relationships and toxicity terminology.</td>
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<td>2. Give examples of organ specific toxicity with representative toxicants.</td>
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<td>3. Identify sources of variation in individual susceptibility to toxicants.</td>
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<td>4. Explain how current regulatory limits are developed</td>
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<td><strong>Initial Self-Evaluation due Jan 22</strong></td>
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<td><strong>Project Assignment: Submit topic to Instructor for approval prior to January 29.</strong></td>
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<td>Jan 28</td>
<td>3. Water quality (Reynolds)</td>
<td>16 Suppl. D2L</td>
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<td>1. Use of risk assessment in water quality regulation</td>
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<td>2. Be able to discuss water cycle, availability and quality.</td>
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<td>3. Be familiar with primary water hazards/risks</td>
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<td>4. Discuss strategies of maintaining water quality</td>
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<td>Feb 4</td>
<td>4. Recreational water, soils and emerging infections (Reynolds)</td>
<td>2, 25, Suppl. D2L</td>
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<td>1. Understand the role of environmental waste management on drinking and recreational</td>
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<td>water quality.</td>
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<td>2. Identify the public health risk of recreational waterborne exposures.</td>
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<td>3. Describe the physical-chemical characteristics of soil</td>
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<td>4. Understand the relationship between soil characteristics and contaminant transport/fate</td>
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<td>5. Discuss methods of analysis for basic soil properties</td>
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<td>6. Evaluate tools for assessing geographical information related to environmental/ecological health</td>
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<td>Feb 11</td>
<td>5. Risk assessment (Humble)</td>
<td>27</td>
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<td>1. Introduction to risk assessment</td>
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<td>2. Describe how risk assessments are carried out.</td>
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<td>3. Consider the role of environmental toxicants in disease clusters.</td>
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<td>4. Describe risk communication principles</td>
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<td>Feb 18</td>
<td><strong>Exam I (4:00-5:15 PM)</strong></td>
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Legionella (5:30 to 6:45 PM) (Hanlin)
1. Microbial ecology of building water systems.
2. How Legionella colonizes these systems.
3. Legionnaires’ disease - sources, vectors of infection, disease manifestations, morbidity/mortality estimates, review of several recent outbreaks.

Presentation Outline: Submit topic to Instructor for approval prior to February 24.

Feb 25 7. ****UA Reading Day- no class*****

Mar 4 8. Occupational and environmental health (Griffin)
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.

Mar 11 9. Chronic effects of environmental contaminants (4-5:15 pm) (Furlong)
1. Pesticide use and mixtures
2. Health outcome assessments- neurological outcomes
3. Pediatric and vulnerable population effects
4. Use of metabolomic and epigenomic exposure signatures

Mar 18 10. Preparedness (Arora)
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
5. One Health systems overview

Mar 25 11. Exam 2 (4:00-5:15 PM)
Energy, transportation and urbanization (5:30-6:50 pm) (O’Rourke)
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

Apr 1 12. Ambient and indoor air quality (Lim)  13, 17
   1. Anticipate pollutant generation and dispersal
   2. Evaluate duration of exposure differences between indoor and outdoor air
   3. Consider the different types of contaminants found in indoor environments vs. ambient air
   4. Identify ways to control indoor contaminants

Climate change, population pressure and sustainability (Lim) 12, 15
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.

Presentation Draft due in D2L Dropbox prior to April 12

Apr 8 13. Food Safety (Hanlin) 18, 19
1. Major foodborne pathogens
2. Contributing factors to foodborne disease
3. Classes of foods and types of foods associated with recalls
4. Role of FDA, USDA, EPA and CDC.

Apr 15 14. Special Topics (TBD) (Lim)

All Submit Final Presentation to the D2L Dropbox by April 22

Apr 22 15. Presentations Group 1

Apr 29 16. Presentations Group 2

Final Self-Evaluation due May 5

FINAL EXAM- Wednesday May 12, 6-8 pm Drachman Hall A114