SYLLABUS
Environmentally Acquired Illnesses (EAI)
EHS 420/520
Spring 2020

Location: Online, asynchronous

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Guest Lecturers
TBD

Office Hours: Online, by appointment

Course Description:

Illnesses related to environmental exposures are on the rise but frequently misdiagnosed due to a lack of understanding of the complexities of multiple hazard exposures and variable health outcomes. This course provides an overview of common and emerging Environmentally Acquired Illnesses (EAI) and explores the multitude of hazards, conditions, and predisposing factors related to human disease. Students will gain foundational knowledge of EAI and tools for environmental monitoring and mitigation as well as patient diagnosis and treatment options. In addition, they will critique current research design, identify gaps in the current model of environmental exposure assessment, and gain knowledge in a systems approach to understanding, evaluating, and communicating the impact and control of EAI relative to human health.

Course Prerequisites: None


Course Objectives and Expected Learning Outcomes:

1. **Course Objectives:** During this course students will:
   - Specify emerging environmentally acquired illnesses (EAI) and related outcomes
   - Describe barriers to diagnostics and treatment of EAI
   - Evaluate the current state of research and future study design
   - Develop outreach tools for EAI awareness and assessment

2. **Undergraduate Student Learning Outcomes (Competencies Obtained):**
Undergraduate Foundational Competencies
- The ability to locate, use, evaluate, and synthesize public health information.

Undergraduate Foundational Domains
- Understand the underlying science of human health and disease, including opportunities for promoting and protecting health across the life course.
- Understand the socioeconomic, behavioral, biological, environmental and other factors that impact human health and contribute to health disparities.

Undergraduate Learning Domains
- Understand foundations of scientific knowledge, including the biological and life sciences and the concepts of health and disease.

Undergraduate Cross-Cutting Concepts and Experiences
Develop:
- Critical thinking and creativity
- Research methods
- Systems thinking

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

- Recognize and classify the major types of chemical, physical and biological exposure agents capable of inducing disease in the public. (assessed in module 2 quiz- Overview of EAI)
- Utilize basic strategies for evaluating or measuring exposure to chemical, physical and biological agents. (assessed in module 11 HW and quiz- Environmental exposure routes)
- Identify control methods for reducing worker or public exposures to acceptable levels. (assessed in module 13 HW- Remediation and avoidance)
- Utilize various sources of information to identify chemicals commonly employed in industry and their toxicity. (assessed in module 10 paper presentation- Occupational case studies)
- Describe the base mechanism of toxicity and potential health effects and diseases caused by various chemical agents. (assessed in module 3 HW and quiz- Physiological pathways and predispositions)
- Identify the steps involved in environmental and occupational health research. (assessed in Midterm exam question on evidence of toxicant dose and health outcome research and in Final exam question on evidence of environmental exposure history and health outcome research)
- Demonstrate fundamental knowledge of the principles of environmental health sciences and be able to apply them. (assessed in Midterm question on the systems approach to linking environmental exposures to chronic health effects)
- Implement assigned research or work tasks including, data collection and management, evaluation, and data analysis. (assessed in modules 10 and 14- Paper presentations)
- Identify and communicate to the appropriate people the need for resources to minimize health and safety risks. (assessed in module 14 paper presentation- Remediation and avoidance; and final exam question on EAI research gaps)
- Develop effective written and oral communication skills. (assessed in modules 10 and 14- Paper presentations)
- Develop new, innovative, applied or theoretical knowledge through research of health related issues. *(assessed in modules 10 and 14- Paper presentations and 5, 13 HW and 15 discussion posts)*
- Develop expertise in an environmental health science subspecialty. *(assessed in graduate student led paper presentation discussion posts in modules 10 and 14 and 11, 12, 13 HW)*

**Course Notes:** You are expected to take your own notes as you actively read required content, distill major themes and identify relationships between multiple concepts. Interactive material may include readings/videos/podcasts. Other notes may be posted on D2L.

Students will be assigned a variety of readings at the beginning and throughout the semester. Any required readings not on the syllabus will be announced and made available a week in advance.

**Course Requirements:** You are expected to read the assigned chapters before watching lectures, respond to questions on discussion boards, submit homework and assignments on time, take exams on the specified dates, and successfully complete any work given. 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 regularly check this e-mail.

1) **Active learning:** You will be expected to prepare before discussions, having already read the assigned material (or watched any assigned videos or listened to any assigned podcasts). Assignments and discussions will reinforce what you learned in the readings/videos/podcasts.

2) **Community** - Your fellow students will be relying on you to be prepared and not hold them back in their learning process. You are expected to bring your best effort to this course. The topic of this course is on the cutting edge of scientific research and understanding, with many unproven hypotheses and inconsistent research results. You are expected to keep an open mind and explore data gaps while respecting the scientific process and considering individual outcome differentials. We will work to provide you with interesting, inspiring and exciting learning opportunities, and to create an environment that helps you reach your learning and critical thinking potential.

3) **Time investment** – For online college courses an equivalent of 45 hours of work by each student is required for each unit of credit. For a 3 credit course, students should expect to spend an average of 9 hours per week engaged in course materials.

**Grading Scale/Student Evaluation and Policies:**

**Due Dates** for assignments are designated in D2L. This course is carefully timed for optimizing routine student engagement and deliverables. Thus, late assignments will not be accepted. No credit will be given for assignments not completed on time.

**Examinations:** Students will be expected to demonstrate that they have met the course objectives through homework assignments and examinations. Two exams will be given (1 midterm and 1 final). Exams will consist of multiple choice, short answer and short essay questions. Self-evaluations or take-home questions may also be assigned with designated due dates listed on the assignment. It is your responsibility to clear your calendar and take the exams at the scheduled time.

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.

**Power Point Presentations/Reflections:** Throughout the semester students will participate and contribute to online discussions of assigned readings or other content. Readings will be assigned weekly. Students will be assigned readings to analyze and develop a power point presentation on the assigned topic. Students will also be expected to reflect on other student presentations and readings throughout
the semester. Each effort will be assessed based on completion, demonstration of knowledge, and critical thinking.

**Assessment Quizzes:** Students are expected to complete readings, reflections and assessment quizzes approximately weekly.

**Class Attendance/Participation:** Students are expected to engage online weekly and participate in discussions or other posted activities.

**400/500 Co-Convened Courses:** Following the ideals of Bloom’s Taxonomy, (Bloom, B., ed. 1956. *Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I: Cognitive Domain. New York, NY: Longman*), students enrolled in the 400 level course will be expected to demonstrate knowledge of the EAI topic by describing key illnesses, outcomes, treatments, and barriers. They will also be expected to interpret current research and study designs while applying their knowledge to develop new outreach tools and materials and recognizing a systems approach to mitigating EAs.

Students at the 500 course level will be expected to have more in depth presentations and discussion postings, be more analytical in their assignments, and to think more critically about the assigned readings and thought questions, beyond what has been presented in class materials. Graduate students are expected to exercise a higher level of analysis and evaluation, moving beyond memorization and toward deeper understanding and application relative to their own research or practice experience and goals. As such, graduate students will have a greater involvement/expectation in class and discussion forums, requiring increased depth of response. Graduate students are further expected to independently seek out new information related to environmentally acquired illnesses and introduce novel ideas and discussion points to the class via an in depth investigation of the literature beyond concepts introduced by the instructor(s). This will require use of additional readings and reflections to synthesize creative concepts for paper presentations and discussion activities.

Conversely, undergraduate students will be expected to primarily draw upon assigned readings for presentation, discussion, and reflection.

**Grading:** 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>
</tr>
</thead>
<tbody>
<tr>
<td>Exams 2 @ 100 pts ea</td>
<td>200</td>
<td>A</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Paper presentations 2 @ 50 pts ea</td>
<td>100</td>
<td>B</td>
<td>80% to &lt;90%</td>
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<tr>
<td>Assessment quizzes 11/12 @ 10 pts ea*</td>
<td>110</td>
<td>C</td>
<td>70% to &lt;80%</td>
</tr>
<tr>
<td>HW Discussion/reflections 10 @ 10 pts ea</td>
<td>100</td>
<td>D</td>
<td>60% to &lt;70%</td>
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</tbody>
</table>

**Total points** 510

*the lowest quiz grade will be dropped from total points

**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-](https://www.registrar.arizona.edu/personal-).
Accessibility and Accommodations:
At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, you are welcome to let me know so that we can discuss options. You are also encouraged to contact Disability Resources (520-621-3268) to explore reasonable accommodation. 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. For additional information on Disability Resources and reasonable accommodations, please visit http://drc.arizona.edu/students

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

Consequences for any type of academic misconduct may include loss of points or zero grade for the assignment, or a failing course grade. Requests for incompletes (I) and withdrawal (W) must be made in accordance with University policies. University policy regarding grades and grading systems is available at: http://catalog.arizona.edu/policy-type/grade-policies

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

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

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 - see D2L roadmap for assignment details:

<table>
<thead>
<tr>
<th>Module/Week</th>
<th>Date</th>
<th>Activity/Topic</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Jan 15</td>
<td>Course structure/syllabus; Introductions; Introduction to EAI and risk paradigms</td>
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<tr>
<td>2</td>
<td>Jan 22</td>
<td>Overview of EAI- sensitivity vs toxicity; mold, <em>Bartonella</em>, EMFs</td>
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<tr>
<td>3</td>
<td>Jan 29</td>
<td>Physiological pathways and predispositions</td>
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<td>4</td>
<td>Feb 5</td>
<td>Diagnostics/testing- intestinal barriers; mast cell activation</td>
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<td>5</td>
<td>Feb 12</td>
<td>Treatment- detoxification; personalized medicine; behavioral modifications</td>
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<tr>
<td>6</td>
<td>Feb 19</td>
<td>Holistic health/ homeopathy/ integrative/functional medicine</td>
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<td>7</td>
<td>Feb 26</td>
<td><strong>Midterm Exam</strong></td>
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<tr>
<td>8</td>
<td>Mar 4</td>
<td>Microbiome- gut biome; environmental influences; MARCoNS</td>
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<td>Mar 11</td>
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<td><strong>UA Spring Break</strong></td>
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<tr>
<td>9</td>
<td>Mar 18</td>
<td>Exposome/ epigenetics- -omics epidemiology</td>
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<tr>
<td>10</td>
<td>Mar 25</td>
<td><strong>Paper 1 Due</strong></td>
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<tr>
<td>11</td>
<td>Apr 1</td>
<td>Environmental exposure routes- exposure history; impacts on children</td>
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<tr>
<td>12</td>
<td>Apr 8</td>
<td>Monitoring/Test labs- water damaged buildings; fungal pollution; metal testing</td>
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<tr>
<td>13</td>
<td>Apr 15</td>
<td>Remediation/ Avoidance- prevention guides; survival tools; workplace controls</td>
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<tr>
<td>14</td>
<td>Apr 22</td>
<td><strong>Paper 2 Due</strong></td>
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<tr>
<td>15</td>
<td>Apr 29</td>
<td>Social Support/Advocacy/Compassionate care</td>
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<tr>
<td></td>
<td>May 12</td>
<td><strong>Final Exam- timed exam; open from 8 am to 10 pm</strong></td>
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