Mel and Enid Zuckerman College of Public Health  
University of Arizona  

SYLLABUS  
EHS 525 - Spring 2021  
Global to Local: Environmental Change and Human Health

**Time:** Wednesdays 1:00-3:50pm

**Location:** Live Online via Zoom

**Instructor(s):**
Name: Mona Arora, MSPH, PhD  
Phone: (520)-626-0612  
E-mail: manand@email.arizona.edu

**Instructor Availability:** By appointment only as scheduled via e-mail (Note: Please allow up to 24 hours response time during weekdays and 48 hours during weekends.)

**Catalog Description:** How does a changing environment affect human health? What is the public health role in mitigating and addressing these implications? Students in this course will directly interact with these questions and explore the fundamentals of global environmental change with a focus on climate change. Students will develop a better understanding of the direct and indirect pathways through which climate and the environment influence human health; the mechanisms and strategies employed to manage and address these impacts; and the challenges and opportunities facing public health researchers and practitioners alike.

**Course Description:** This course is designed to expose students to the various, complex mechanisms through which anthropogenic changes influence the health of the environment and subsequently human health. During this course, students will be introduced to key concepts including health risks associated with climate change and other human-mediated global environmental changes; local, regional, and national efforts underway to understand and manage the adverse impacts, and the factors influencing progress on this issue. Students will have the opportunity to engage with researchers and practitioners to learn about the current science as well as challenges and opportunities associated with identifying, managing, and addressing the health implications of climate change and other anthropogenic changes.

**Course Prerequisites:** This is an introductory course open to students without specific training in the areas of climate change, environmental sciences, and/or public health.

**Course Learning Objectives:**
1. Describe the role of the public health enterprise in managing and addressing the health impacts of climate change.
2. Determine how to weigh the evidence for impacts on a specific health outcome.
3. Demonstrate knowledge of the health implications of climate change via group activities and projects.
4. Compare and contrast the role of adaptation and mitigation actions and explain importance of developing programs and policies with co-benefits for public health.
5. Understand the methods and tools utilized to quantify the health impacts of climate change and the associated exposure pathways.
6. Demonstrate knowledge of the interconnectedness of environment and health.
7. Illustrate understanding of the climate drivers of human health and the exposure pathways through which impacts occur.
8. Describe the research needs and priorities for enhancing the public health response to climate change.

**MPH/Program Competencies Covered:**

**Course Learning Outcomes:** By the end of the course, students will be able to:
1. Assess population needs, assets and capacities that affect communities’ health.
2. Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings.
3. Select methods to evaluate public health programs.
4. Propose strategies to identify stakeholder and build coalitions and partnerships for influencing public health outcomes.
5. Evaluate policies for their impact on public health and health equity.
6. Communicate audience-appropriate public health content both in writing and through oral presentation.

**One Health Program MPH Competencies Covered:**

**Course Learning Outcomes:** By the end of the course, students will be able to:
1. Develop strategies to address One Health challenges by engaging researchers across multiple disciplines and stakeholders with diverse perspectives, motivations, and economic incentives.
2. Identify ecosystem changes and impacts that affect human, animal and planetary health.

**Climate and Health Competencies Covered:**

**Course Learning Outcomes:** By the end of the course, students will be able to:
1. Demonstrate an understanding of the complex relationships between climate change and health.
2. Demonstrate competence in recognizing population-based hazards and designing and implementing public health interventions.
3. Demonstrate familiarity with international and domestic policies relevant to climate change and health.
4. Demonstrate competence on how to communicate health and climate information to different audiences.

**Course Notes:** Online course materials will be available through the Desire 2 Learn (D2L) website. You are expected to take your own notes in class. Computers, phones, iPads, and other electronic devices use is not allowed during class unless directed for specific class activities. Class lecture material including select readings (e.g., USGCRP Climate & Health Assessment, research articles) will be posted on D2L.
Required Texts or Readings: The literature on climate change and health is rapidly evolving. Therefore, students will be tasked with reviewing research articles, policy briefs, case studies, and/or government reports throughout the course of the semester. Students will also be expected to view assigned online webinars and videos pertaining to the course topics. Additional readings will be assigned from the following:

2018 IPCC Special Report: Global Warming of 1.5°C
Intergovernmental Panel on Climate Change
https://www.ipcc.ch/sr15/

2018 Fourth National Climate Assessment
U.S. Global Change Research Program
https://nca2018.globalchange.gov/

2016 Climate & Health Assessment
U.S. Global Change Research Program
https://health2016.globalchange.gov/

2010 A Human Health Perspective on Climate Change
National Institute of Environmental Health Sciences

Protecting Health from Climate Change: Vulnerability and Adaptation Assessment
World Health Organization
https://www.who.int/globalchange/publications/vulnerability-adaptation/en/

Concept mapping software: (Optional)
We will be using concept maps as a tool for evaluating and assessing our learning. Although many free online software are available to aid in developing concept maps, you are not required to utilize a particular format.

The instructor will be using Cmap, a free program to develop concepts maps for this course.
https://cmap.ihmc.us/

Alternatively, students may develop their concept maps by hand or using any other software and scanning/uploading the resulting diagram onto D2L.

Course Requirements: In addition to class attendance, students are expected to complete required readings prior to lecture, participate in class discussions, and submit assignments on time on the specified dates. Students will be required to collaborate with peers to lead a class session on an instructor-approved topic of interest. Additional details will be provided in class and on D2L. Students will be asked to provide a University of Arizona e-mail address unless they have permission from the instructor. Changes and other information about the class will be posted on the D2L course page. It is your responsibility to check course announcements online.

Expectations:
Students who are enrolled in this course are expected to:
- Attend all lecture sessions.
- Complete review of required readings prior to the lecture.
• Come to class prepared to ask questions and participate in discussions.
• Prepare to lead in-class discussions.
• Work collaboratively with peers on assigned group projects.
• Communicate questions and concerns to the instructor promptly.

Grading Scale/Student Evaluation

The grading system for this course is as follows:

<table>
<thead>
<tr>
<th>Evaluation Component</th>
<th>Potential Points</th>
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</thead>
<tbody>
<tr>
<td>Class Attendance &amp; Participation</td>
<td>100</td>
</tr>
<tr>
<td>Class Session Lead Presentation</td>
<td>100</td>
</tr>
<tr>
<td>Assignments Portfolio</td>
<td>150</td>
</tr>
<tr>
<td>Term Project</td>
<td>200</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>550</strong></td>
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Final grades will be based on the following relative point system:

- A = 90-100%
- B = 80-89.9%
- C = 70-79.9%
- D = 60-69.9%
- E = < 59.9%

Course Deliverables

Students will be required to complete all course assignments designated during this course. Students must demonstrate their ability to understand the material presented in class and assigned readings through in-class discussions. Homework assignments, group presentations, and the term project will all be utilized to evaluate the ability of the student to think critically and apply the information presented via lectures. Students will also be asked to work in groups to lead specific class sessions on designated topic areas.

Class Attendance & Participation (100 pts)
Class attendance and participation is required. Participation will be graded based on engaging in class discussions, responding to any preparatory discussion prompts and/or surveys, completing and providing peer feedback to concept maps and contributing to in-class activities. For each class period, students will be assigned a set of readings. Students are expected to come to class prepared to discuss these readings. Class discussion will be centered around sharing your insights and perspectives relating to:

1. Critique and evaluation of the reading.
2. Provide perspective from your discipline: e.g., what role do other sectors and disciplines have in understanding this issue? Addressing the health implications of this issue? How involved are these other sectors and disciplines?
3. What are the limitations and challenges in our understanding of this sub-topic? What do you think your discipline can bring to the table?
Any student with more than 2 unexcused absences will lose 3 points for each subsequent absence (i.e., for 3 unexcused absences you lose 3 points total, for 4 unexcused absences you lose 6 points total, etc.). All holidays or special events observed organized religions will be honored for those students who show affiliation with that particular religion. Absences related to professional improvement including conferences, presentations with community partners, will be excused with prior request. Absences pre-approved by the UA Dean of Students (or Dean’s designee) will be honored. Students must notify the course instructor prior to their absence.

Class Attendance & COVID:
- If you feel sick or may have been in contact with someone who is infectious, stay home. Except for seeking medical care, avoid contact with others and do not travel.
- Notify your instructors if you will be missing an in person or online course meeting, or you will miss an assignment deadline.
- Non-attendance for any reason does not guarantee an automatic extension of due date.
- Please communicate and coordinate any request directly with your instructor.
- Campus Health is testing for COVID-19. Please call (520) 621-9202 before you visit in person.
- Visit the UArizona COVID-19 page for regular updates.

Class Session Lead Presentation (100 pts):
All students will be required to individually lead a one-hour class session on a selected topic relating to health and climate (not covered in class). A list of possible topics will be provided to students on D2L. Leading the class sessions will involve a 1-hour presentation and activity critically discussing the chosen topic including current research, nature of impact (e.g., spatial, temporal scales, across sectors), methodologies limitations/challenges, research needs, and policy impacts and needs. Additional details regarding the grading rubric and expectations will be available in class and on D2L.

Assignments Portfolio (150 pts):
Students will be required to complete the following portfolio assignments:

**Discussion Lead (25 pts): DUE Date Varied**
Each student must lead 1 class discussion. Leading discussion involves the following:
1. Complete assigned readings and any associated activity prior to class.
2. Supplement your understanding of the issue through further topic exploration.
3. Researching Solutions: What programs, policies, and strategies have been adopted and implemented to address the particular climate and health issue?

**Environmental Change Journal (125 pts): DUE Date Varied**
Students will be required to maintain an Environmental Change Journal reflecting on the topics discussed in class, online webinars, and other class activities. The journal will include:
- **Online webinar reviews**: 1-page reflections of 3 chosen climate-health related topic webinars of interest. (10 points each) Various due dates
- **Class reflections**: on Weeks 1, 9 and 16 of class discussing your knowledge and perceptions of climate change, what you hoped to learn or learned in class; facets, topics, or sessions that resonated most with you. (5 points each) Various due dates
- **Tracking your Carbon Footprint**: (40 points) Track your lifestyle and calculate your footprint for one week in class. Bring your activity log in class to discuss and compare results. Pre and post reflection of your lifestyle and footprint
• **Short Assignments (40 points):** There will be 4 short tasks associated with select weekly readings that you will be asked to complete prior to class. These tasks may by one of the following: exploring an online tool, looking up specific details in a climate change plan, or reporting on a brief environmental scan using a Qualtrics survey.
  - **Task 1:** Description of a Critical Climate Change issue in your hometown (or other chose region) Description of climate and health impacts in your chose location.
  - **Task 2:** How is climate change being addressed in this location? Who is leading or is involved in this effort?
  - **Task 3:** What does health and inequity look like?
  - **Task 4:** Where do you see your profession in the climate and health dialogue? What are the gaps and needs?

**Term Project & Presentation (200 pts):**

Students will be required to work in groups of 2-3 individuals to identify a specific environmental-change issue and evaluate predominant policies and approaches adopted to address the issue. Students are encouraged to review and integrate cross-sectoral solutions, models, and approaches that will aid in addressing this public health-climate change challenge. Examples may include:
- Making the case for co-benefits of climate change and the integration of practices and programs across sectors to optimize health co-benefits in a local context.
- Synthesizing existing policies and programs to identify best practices to address a chosen health impact of climate change.
- Analyzing and evaluating the partnerships in place from a knowledge co-production framework.
- Students will be required to submit a one-page proposal for their chosen topic area by 2/10.

Additional details regarding the grading rubric and expectations will be available in class and on D2L.

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**Late Submission Policy**

All due dates will be posted in the syllabus and on the D2L course page. It is the student’s responsibility to ensure that the assignments are turned in on time. All late assignments will be penalized 10% per day and late submissions will only be accepted within one week of the due date. After this time, the student will be awarded zero points for the assignment.

### Course Schedule

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<thead>
<tr>
<th>Week</th>
<th>Course Topic</th>
<th>Homework</th>
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<tbody>
<tr>
<td>January 13th (Week 1)</td>
<td>Introduction &amp; Course Overview</td>
<td>CDC Public Health 101 Webinar &amp; online modules Public Health 3.0</td>
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**Part I: Mechanisms & Implications**

<table>
<thead>
<tr>
<th>Week</th>
<th>Course Topic</th>
<th>Homework</th>
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<tbody>
<tr>
<td>January 20th (Week 2)</td>
<td>Public Health 101: What is public health? Climate Change, Health and Resilience: Connections, Directives and Challenges</td>
<td>Science of Climate Change (Video) US National Climate Assessment: (Ch. 1 &amp; 2) <strong>Class reflection 1 due</strong></td>
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<tr>
<td>Date</td>
<td>Topic</td>
<td>Readings</td>
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<tr>
<td>January 27th</td>
<td>Understanding Climate Change: Science &amp; Mechanisms</td>
<td>Frumkin 2008&lt;br&gt;APHA Guide Chapter 4&lt;br&gt;<strong>Task 1 due</strong></td>
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<tr>
<td>(Week 3)</td>
<td><em>Guest lecture: TBD</em></td>
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<tr>
<td>February 3rd</td>
<td>Climate Change, Health and Resilience: Connections, Directives and Challenges</td>
<td>USGCRP Climate &amp; Health Assessment&lt;br&gt;(Ch. 1)&lt;br&gt;Anderson 2019&lt;br&gt;Limaye 2019&lt;br&gt;<strong>Webinar 1 review due</strong></td>
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<tr>
<td>(Week 4)</td>
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<tr>
<td>February 10th</td>
<td>Environmental Drivers of Human Health: Exposure Pathways &amp; Mechanisms/Methods for Quantifying Climate-Health Impacts</td>
<td>Marinucci 2014&lt;br&gt;Stanke 2013&lt;br&gt;USGCRP Climate &amp; Health Assessment&lt;br&gt;(Chapter 4)&lt;br&gt;<strong>Team Project &amp; Proposal due</strong></td>
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<tr>
<td>(Week 5)</td>
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<td>(Week 6)</td>
<td><em>Guest Lecture: Matt Roach (ADHS)</em></td>
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<td><strong>Part II: Human Health Impacts</strong></td>
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<td>February 24th</td>
<td>Health Impacts and Vulnerable Populations/Intersections and Approaches Health, Equity, and Climate Change</td>
<td>VBDs and the Changing Environment&lt;br&gt;(Video)&lt;br&gt;USGCRP Climate &amp; Health Assessment&lt;br&gt;(Chapter 5)&lt;br&gt;<strong>Task 2 due</strong></td>
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<tr>
<td>(Week 7)</td>
<td><em>Guest Lecture: TBD</em></td>
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<tr>
<td>March 3rd</td>
<td>Ecosystem, Animals, and Vector-borne &amp; Zoonotic Diseases</td>
<td>USGCRP Climate &amp; Health Assessment&lt;br&gt;(Chapter 2)&lt;br&gt;CDC Use of Cooling Centers to Prevent Heat-Related Illness: Summary of Evidence and Strategies for Implementation&lt;br&gt;<strong>Webinar 2 review due</strong></td>
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<tr>
<td>(Week 8)</td>
<td><em>Guest Lecture: Kacey Ernst (UA College of Public Health)</em></td>
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<td>March 10th</td>
<td>Reading Day</td>
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<tr>
<td>(Week 9)</td>
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<td>March 17th</td>
<td>Urban Planning &amp; Extreme Heat: Implications for Health</td>
<td>National Academies Report&lt;br&gt;<strong>Mid-term Class Reflection due</strong></td>
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<tr>
<td>(Week 10)</td>
<td><em>Guest Lecture: Ladd Keith</em></td>
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<tr>
<td>March 24th</td>
<td>Climate Change and COVID-19 Connections and Implications</td>
<td>Climate Change and Agriculture Report&lt;br&gt;Online webinar</td>
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<tr>
<td>(Week 11)</td>
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<tr>
<td>March 31st</td>
<td>Agriculture, Food Security and Safety Implications</td>
<td>NCA Chapter 8&lt;br&gt;APA Report on Climate and Mental Health&lt;br&gt;<strong>Webinar 3 review due</strong></td>
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<tr>
<td>(Week 12)</td>
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<tr>
<td>April 7th</td>
<td>Mental Health Impacts of Climate Change</td>
<td>USGCRP Climate &amp; Health Assessment&lt;br&gt;(Chapter 9)&lt;br&gt;APHA Guide Chapter 2&lt;br&gt;Climate Changes Health Equity (APHA Webinar)&lt;br&gt;<strong>Task 3 due</strong></td>
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<tr>
<td>(Week 13)</td>
<td><em>Guest Lecture: TBD</em></td>
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**Part III: Public Health Response**
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<tr>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
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</thead>
</table>
| April 14th (Week 14) | Healthcare Sector & Climate Change  
*Guest Lecture: TBD* |  
*Health Affairs Blog (October 2019)*  
McDermott-Levy 2019  
APHA Climate & Health Communications Guide |
| April 21st (Week 15) | Reading Day | |
| April 28th (Week 16) | Climate Change Communication/ Science for Decision-making: Knowledge Co-production Frameworks  
*Guest Lecture: Connie Woodhouse* |  
Meadow 2015  
Linking Environmental Research and Practice 2014 Report  
Williamson 2018  
Carbon Footprint Activity due  
Webinar 4 review due |
| May 5th (Week 17) | Facilitating Behavioral Change in Climate Change |  
Task 4 due |
| May 12th | Term Project Presentations |  
Final class reflection due |

**Course Policies**

**Academic advising:** If you have questions about your academic progress this semester, or your chosen degree program, please note that advisors at the Advising Resource Center can guide you toward university resources to help you succeed.

**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-correspondence-students](https://www.registrar.arizona.edu/personal-information/official-student-email-policy-use-email-official-correspondence-students)

**Accessibility and Accommodations:**
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](https://drc.arizona.edu)) to establish reasonable accommodations.

**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](http://deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity)

**Classroom Behavior:** (Statement of expected behavior and respectful exchange of ideas:}
Present policies to foster a positive learning environment, including use of cell phones, mobile devices, etc.). Students are expected to be familiar with the UA Policy on Disruptive Student Behavior in an Instructional Setting found at: http://policy.arizona.edu/education-and-student-affairs/disruptive-behavior-instructional-setting

Life challenges: If you are experiencing unexpected barriers to your success in your courses, please note the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office can be reached at 520-621-2057 or DOS-deanofstudents@email.arizona.edu.

Physical and mental-health challenges: If you are facing physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520-621-9202. For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.

Nondiscrimination and Anti-Harassment Policy:
The University of Arizona is committed to creating and maintaining an environment free of discrimination, http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-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 by the instructor.

Threatening Behavior Policy: The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to one’s self, http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students

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, http://policy.arizona.edu/ethics-and-conduct/smoking-and-tobacco-policy

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.