Syllabus: Spring 2020

HP448: Global Environmental Changes and Health

**Course Instructor:** Ed Avol

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Department of Preventive Medicine

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**Time:**  11am to 12:20pm

**Location:**  VKC155

**Office Hours:** Tuesday and Thursday mornings, 0730 to 1030

Tutor Campus Center (TTC) Family Room;

Other Days and Hours by Appointment

**COURSE DESCRIPTION**

This course will systematically discuss the environmental and public health implications of the global environmental changes underway. Within the context of this course, these include issues of water access and sustainability, air quality, extreme weather events, population growth and mobility, the world food supply, urbanization and urban sprawl, vector-borne disease transmission, agricultural shifts, deforestation, and armed conflicts (see lecture listings table below for additional topics). We will discuss the causes and components of these issues, develop improved understanding about what we can do to adapt to the likely changes underway and ahead for the planet, and what might be done to mitigate these impacts on human health.

**GOALS**

The overarching goal of this course is to engage students in a broad overview of the global environment, provide them with the tools and opportunities to both gain an appreciation for and critical evaluation of the mechanisms involved in changes to the global environment, and to gain a perspective as to how changes in the global environment might, can, and do affect human health worldwide.

**LEARNING OBJECTIVES**

By the end of this course, students should be able to:

* Identify and appreciate major global environmental changes
* Understand key components of climate change and its potential human health impacts
* Link global environmental changes to specific health outcomes
* Understand biological mechanisms involved in environmental exposure-mediated disease development
* Conduct appropriate literature reviews, write a summary paper, and give a scientific presentation on a global environmental health issue.

**COURSE ELEMENTS**

This course will involve several inter-related components that together provide a general introduction to the skills and topics needed to develop a broad public health understanding.

***1.*** ***Class Meetings***

Each class meeting will generate and involve lively discussion among and between students and instructors on the issues being presented. This classroom atmosphere is decidedly a participatory activity, NOT a passive presence. Students are expected to regularly participate, exchange ideas, debate their opinions, and reach improved levels of understanding.

Class meetings will be organized in a variety of formats – lectures, debates, videos, hands-on activities – to stimulate the thinking and engagement of the students. Classes will typically be overseen by the course instructor, augmented by occasional guest lecturers to provide added expertise in specific topic areas. Lecture slides will generally be posted on the course Blackboard website to engage students in daily class participation.

Periodic class quizzes (in the first ten minutes of class) on course material will be a routine part of in-class activities. Quizzes are used to encourage prompt class attendance, identify how effective previous class lectures have been in conveying course content, and to encourage completion of assigned reading or video viewing prior to class. Students cannot make-up missed quizzes; quizzes are a one-time in-class-only opportunity.

***2. Content Lectures***

The course instructor will provide lecture/background slides for most class lectures on the respective topic to be considered. PowerPoint-type slides will usually be prepared and presented, augmented by assigned readings or videos. This will be done to provide insights and perspectives on the material and to motivate classroom discussion. Lectures should be seen as a launch point for discussion, not as an endpoint in and of itself. Typically, lecture slides will be posted on Blackboard. It is strongly encouraged that students review the recommended reading materials and video viewings prior to class, so that they may participate meaningfully in classroom discussions on the day of presentation. Questions, comments, insights, and personal experiences are always welcomed and encouraged.

***3. Global Environmental Health (GEH) Changes***

Students will sequentially have a scheduled opportunity, typically at the beginning of class throughout the semester, to prepare and present a ***five-minute*** oral presentation to the class on recent news-reported example of how some aspect of global environmental change is impacting the environment and/or human health. A slide or video presentation may be helpful to facilitate the presentation (but keep in mind the time allowed -- five minutes -- so don’t get too carried away with slides!). GEH Moments should address some of the following questions: What’s changing (what is the topic about)? Who or what is being affected? What are the potential health or environmental impacts? What is being done about the situation? What lessons can we learn from this? What references or sources were used to develop your presentation (i.e., a list of source references or citations). Each presentation should be provided electronically to the course instructor by 9am on the morning of the scheduled presentation so that slides, videos, et cetera can be loaded and prepared in advance of actual class time.

**COURSE READING RESOURCES**

There is no single required text for this course, but there are several useful resources worth noting. One is on reserve in the Leavey Library, and the second is available on-line. These are:

*Global Climate Change and Human Health*; George Luber and Jay Lemery, ISBN: 978-1-118-50557-1 (pbk.); ISBN: 978-1-118-60358-1 (epub); First Edition, Jossy—Bass. (2015).

Intergovernmental Panel on Climate Change (**IPCC**). Reports can be found at:

<https://www.ipcc.ch/reports/>

Additional journal articles, videos, and readings will be provided and posted on Blackboard to facilitate student access.

**ATTENDANCE POLICY**

Students are expected to attend every class for the duration of the class meeting. Failure to attend class, arriving late or lack of active participation may impact your ability to achieve course objectives which could affect your course grade. Students are expected to notify the instructor by email of any anticipated absence or reason for tardiness.

University of Southern California policy permits students to be excused from class, without penalty, for the observance of religious holy days. This policy also covers scheduled final examinations which conflict with students' observance of a holy day. Students must make arrangements in advance to complete class work which will be missed, or to reschedule an examination, due to holy days observance. Please refer to *SCampus* on attendance policies. In consideration of classmates and the instructor, students are asked to keep external distractions

that might interfere with class to a minimum.

**STUDENT-PROFESSOR MEETINGS**

Approximately midway through the semester, a ***mandatory*** individual meeting with the Course Instructor will be scheduled and held with each student. At this meeting, student course performance will be discussed, as will student-offered suggestions for course improvement. These meetings will typically require about 25 minutes of each student’s time and be scheduled in advance with each student in class prior to the meeting occurrence.

**COURSE GRADING**

Course grades will be based on the following class components (which are explained below):

1. Class Discussion Participation (10%)
2. Individual Presentations (10%)
3. Homework (10%)
4. Quizzes (10%)
5. Mid-Term Exam (20%)
6. Group Project Presentation (20%)
7. Final Exam (20%)

The final grading scale for the course will be as follows:

A+     97-100 B+     87-89 C+     77-79 D 61-69

A       93-96 B       83-86 C       73-76           F 0 - 60

A-      90-92 B-      80-82 C-      70-72

Please note that an A+ carries the same weight (4.0) as an A with the University Registrar.

**CLASS DISCUSSION PARTICIPATION (10% OF COURSE GRADE)**

Students are expected to contribute to the development of a positive learning environment and to demonstrate their engagement through active class participation. Class participation consists of meaningful, thoughtful, and respectful participation based on having completed recommended readings and assignments prior to class. When in class, students should demonstrate their engagement in class topics and be prepared to offer comments or reflections about the issues being discussed, or alternatively, have thoughtful questions or voice thoughtful opinions about the materials under consideration. Failure to participate in class discussions will be reflected in the discussion participation grade element.

**INDIVIDUAL PRESENTATIONS (10% OF COURSE GRADE)**

In the course of the semester, there will be several opportunities for students to present brief presentations to the class. Examples of this would include a short Powerpoint presentation in support of an assigned discussion topic, Global Health Moment, or participation in a structured debate. Presentation skills (articulate speaking, a focus on the audience, an organized presentation, logical discussion points, informative slides or video (if used), conformance with time limitations, thoughtful questions for additional discussion) will be the main basis for presentation evaluation.

**HOMEWORK (10% OF COURSE GRADE)**

Periodic homework assignments will be used to augment the classroom learning experience. Assignments will be announced in class and posted on Blackboard, and typically be electronically due to the Instructor (at [avol@usc.edu](mailto:avol@usc.edu) ) prior to the beginning of the next class. Homework grading will be typically be based on a 50-point scale. Points will be assigned (or deducted, as the case may be) in the categories of (a) addressing each of the stated tasks in the respective assignment, (b) the overall clarity and quality of writing and expression, (c) documentation with supporting references and citations.

Homework assignments are periodically assigned on assorted topics and are due at identified times and dates. Their purpose is to extend the learning experience, provide students with an opportunity to explore topics of class interest, and personalize the learning experience by drawing in your life experience into your classroom work.

**Homework Grading Rubric**

Grading of homework assignments is made on the following basis:

Assignments are worth a maximum of 50 points:

1. If no assignment is submitted minus 50pts
2. If an assignment is turned in late subject to 10%/day “fine”
3. If your name is not on the first page of the assignment minus 5pts
4. If no references or citations are provided when information not commonly available is presented in the submitted work minus 5pts
5. If submitted work is only based on one citation minus 5pts
6. If the specific questions listed in assignment are not addressed minus 5pts
7. If the presentation is disorganized, illogical, difficult to follow minus 5pts
8. If there are LOTS of basic grammatical errors (spelling, sentence fragments, missing words) minus 5pts
9. If there is no summary, conclusions, or culmination of ideas minus 5pts

**QUIZZES (10% OF COURSE GRADE)**

Short quizzes will occasionally be given at the beginning of class to assess learning comprehension, confirm assigned readings or videos have been reviewed, and to complement course learning. These will typically be on a weekly basis and will seek to assess fundamental concepts and issues. Quizzes cannot be “made up” if missed. Accordingly, students should make every effort to be in class at the designated start time.

**EXAMS: (ONE MID-TERM & ONE FINAL, EACH WORTH 20% OF OVERALL GRADE)**

In-class testing will be used to assess student understanding of course topics and discussions. A mid-term and a final examination will be given, announced in advance, and/or per the official testing schedule. Testing will be ‘closed-book”. Test format may include short answers, True/False, multiple choice, short essays, and fill-in type questions.

**GROUP PROJECT & PRESENTATION (20 % OF COURSE GRADE)**

The Group Project will consist of a classroom presentation of 20 minutes’ duration. Presentation of a student-selected topic that presents or discusses mitigation of or adaptation to some aspect of global environmental change will be made using PowerPoint, video, social media, or some other interactive approach. This might include a slide presentation, an original game, a play, poem, rap, or artwork (or some other presentation form, based on the decision of the student group and the approval of the Course Instructor). Students will be required to work in sub-groups of three to four students to develop final class projects. Groups and project topics must be approved in advance by the Instructor. Projects may be presented in class at any class meeting subject to advance scheduling with the instructor. A maximum of two group presentations may be scheduled for any given date. Only one Group Project is permitted per student.

The group presentation will inform, educate, and engage classroom peers on the identified global environmental health challenge and the identified mitigation or adaptation approach. Changes in the environment and climate are underway, and the challenge before us all is to minimize their impacts, develop successful strategies for adaptation, and apply novel or validated approaches to them. **I challenge each group to identify an aspect of climate change and its impact on global environmental health, and then offer, develop, and suggest an approach that mitigates the impact and/or adapts in some positive, constructive, innovative, and feasible manner**. In general, each project presentation will frame the matter being presented through a clear and concise presentation of the issue being addressed, a description of the proposed mitigation or adaptation strategy, a critical review of possible alternative responses, an informed discussion of possible outcomes, and a list of references and citations used to develop the presentation. Student project presentations will be followed by a “question-and-answer” period involving the group, the class, and the instructor. This will be done to clarify presented issues and assess understanding of the topics covered. Each individual member of the joint project team must actively and proportionally participate in the preparation *and* presentation of the project. Each student will be individually graded on the proportional merits of their contributions, as well as on the synergistic coherence of the combined group presentation. As part of the evaluation process, each member of the joint project team will provide the Course Instructor with a brief (a few paragraphs) summary of their specific contribution to the overall project.

Group Projects may be scheduled and presented at most any time throughout the semester, pending development of a 3-to-4 member student group, Instructor approval of the proposed topic, and scheduling with the Instructor. A maximum of two presentations will be scheduled to occur within any given class meeting.

**EXTRA CREDIT**

Each student is eligible to submit ONE extra credit assignment over the course of the semester. These can be used to offset less-than-optimal performance on a quiz, or to help provide additional demonstration of student competence in the course topic area. Examples of acceptable extra credit efforts include:

1. attending a seminar or lecture relevant to Global Climate Change and Health and writing a brief report about the presentation, experience, and lessons learned;
2. watching a documentary or video relevant to Global Climate Change and Health and writing a brief report about the presentation and lessons learned.

Extra Credit Reports need only be a few pages (1-3) in length. Extra Credit efforts will be accepted until the last day of the semester (May 1). *After May 1, NO extra credit opportunities or efforts will be accepted*.

**LATE OR MAKE-UP WORK**

Late work will be accepted if and only if an extension request has been submitted to the Instructor and if that request has been approved. Otherwise, papers, homework and presentations are due on the day and time specified. Extensions will be granted only for legitimate/reasonable extenuating circumstances. If the submission is late without permission, the grade will be affected.

**CLASSROOM DISTRACTIONS**

Every effort should be made to make the best use of limited class time together.Do not take class time to peruse the student newspaper, do homework from other classes, or view social media. Cell phones/pagers/loud electronic devices should be turned off or set to “vibrate” during class time. Electronic devices (laptops, tablets, iPads, etc) may be used to take notes during class, at the discretion of the instructor. Failure to comply with these simple and basic rules of classroom etiquette will adversely affect semester course grades.

**ACADEMIC MISCONDUCT**

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](https://policy.usc.edu/scampus-part-b/). Other forms of academic dishonesty are equally unacceptable.  See additional information in *SCampus*and university policies on scientific misconduct, posted at:

<http://policy.usc.edu/scientific-misconduct> .

**SUPPORT SYSTEMS**

*Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call*

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. [engemannshc.usc.edu/counseling](https://engemannshc.usc.edu/counseling)

*National Suicide Prevention Lifeline – 1 (800) 273-8255*

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. [www.suicidepreventionlifeline.org](http://www.suicidepreventionlifeline.org/)

*Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call*

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. [engemannshc.usc.edu/rsvp](https://engemannshc.usc.edu/rsvp/)

*Sexual Assault Resource Center*

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: [sarc.usc.edu](http://sarc.usc.edu/)

*Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086*

Works with faculty, staff, visitors, applicants, and students around issues of protected class. [equity.usc.edu](http://equity.usc.edu/)

*Bias Assessment Response and Support*

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. [studentaffairs.usc.edu/bias-assessment-response-support](https://studentaffairs.usc.edu/bias-assessment-response-support/)

*The Office of Disability Services and Programs*

Provides certification for students with disabilities and helps arrange relevant accommodations. [dsp.usc.edu](http://dsp.usc.edu/)

*Student Support and Advocacy – (213) 821-4710*

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. [studentaffairs.usc.edu/ssa](https://studentaffairs.usc.edu/ssa/)

*Diversity at USC*

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. [diversity.usc.edu](https://diversity.usc.edu/)

*USC Emergency Information*

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. [emergency.usc.edu](http://emergency.usc.edu)

*USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.*

Provides overall safety to USC community. [dps.usc.edu](http://dps.usc.edu/)

**Changes to the Course Syllabus** may be necessary during the semester, based on the progress of course activities, or due to unforeseen or extenuating circumstances. Every effort will be made to provide adequate notification if and as changes are made.Please check the syllabus posted on Blackboard regularly to confirm use of the most current version.

**Course Lectures and Readings:** (periodically updated; check Blackboard for updates)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Wk | Class | Date | Topic | Speaker | Readings (Due for that class date) |
| 1 | 1 | 14 Jan | Intro & Overview | Avol | <https://www.youtube.com/watch?v=Wj36X07K4wE&feature=share&fbclid=IwAR3k0W1j0YfniuxfnINikrnCBXAXBIuC-Q6p_E2NMZ_DMIRMV-QfCH3MHmU>  (8:41 video on 2019 Climate Changes)  HW1 Assigned |
|  | 2 | 16 Jan | Climate Change:  Did We Do That? | Avol | HW1 Due  (53min video)  <http://earththeoperatorsmanual.com/feature-video/earth-the-operators-manual>  For reference, see <https://www.ipcc.ch/reports/> (browse the website to gain familiarity with available reports)  <https://www.ipcc.ch/report/ar5/syr/>  (skim “AR5 Synthesis Report on Climate Change 2014: Summary for Policy Makers” to get a sense of what currently is known)  HW2 Assigned |
| 2 | 3 | 21 Jan | Extreme Weather | Avol | <https://www.c2es.org/content/extreme-weather-and-climate-change/> |
|  | 4 | 23 Jan | Country Extremes | Students | HW2 Due |
| 3 | 5 | 28 Jan | Carbon & Other Geochemical Cycles | Avol | QUIZ 1  Read Chapter 6 Executive Summary: Carbon & other Biogeochemical Cycles (posted on Blackboard)  and then skim pages up to Sec.6.4 for overview of CO2, NO2, CH4 cycles |
|  | 6 | 30 Jan | Urbanization, Urban Sprawl | Avol | UN Report on Worldwide Urbanization Trends, <https://population.un.org/wup/> , 2018 Revisions  QUIZ 2  HW3 Assigned |
| 4 | 7 | 04 Feb | Water | Avol | HW3 Due  “Water in a Sustainable World”, 2015 UN Report, posted on Blackboard, (read Executive Summary, the prologue, and Chapter 1) |
|  | 8 | 06 Feb | Air Quality | Avol | QUIZ 3  (Do adequate laws exist to protect against intercontinental air pollution?) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5726376/> |
| 5 | 9 | 11 Feb | Armed Conflicts | Avol | (Extreme Realities Video (PBS, 52min)):  <http://video.pbs.org/video/2365380402/>  QUIZ 4 |
|  | 10 | 13 Feb | Deforestation & Desertification | Avol | Read this on global forest loss: <https://www.wri.org/blog/2017/10/global-tree-cover-loss-rose-51-percent-2016>  … and watch this 20min TED TALK on desertification:  <http://new.ted.com/talks/allan_savory_how_to_green_the_world_s_deserts_and_reverse_climate_change>; |
| 6 | 11 | 18 Feb | Food | Avol | World Hunger:  <http://www.worldhunger.org/articles/Learn/world%20hunger%20facts%202002.htm>  (Take at least one of the Hunger quizzes, read at least two of the topics under “Learn More” tab, and be prepared to talk about this in class) |
|  | 12 | 20 Feb | Agriculture | Avol | QUIZ 5 |
| 7 | 13 | 25 Feb | Ocean Acidification | Avol | “Ocean Acidification”, IGBP(2013), posted on Blackboard  QUIZ 6 |
|  | 14 | 27 Feb | Sea Level Rise & Social Vulnerabilities | Melodie Grubbs, USC Sea Grant Program | California Climate Change (4th Assessment Report, LA Region), Posted on Blackboard  Pg 2-3, 6-8,15-17, 21-25, 34, 51-52, 54-56, 69 |
| 8 | 15 | 03 Mar | Ecosystems & Biodiversity | Avol | <http://www.nature.com/scitable/knowledge/library/biodiversity-and-ecosystem-stability-17059965>;  <http://www.nature.com/scitable/knowledge/library/causes-and-consequences-of-biodiversity-declines-16132475>;  Aronson et al article on Biodiversity: Birds & Plants, posted on HP448 Blackboard  <http://e360.yale.edu/features/warming-signs-how-diminished-snow-cover-puts-species-in-peril> (Report on impact of changing snowfall on species’ survival) |
|  | 16 | 05 Mar | Climate Engineering | Avol | <http://www.nytimes.com/2015/02/12/opinion/the-risks-of-climate-engineering.html?_r=0>;  <http://dotearth.blogs.nytimes.com/2015/02/12/why-hacking-the-atmosphere-wont-happen-any-time-soon/?action=click&contentCollection=Opinion&module=RelatedCoverage&region=Marginalia&pgtype=article>  <https://www.wired.com/story/how-engineering-earths-climate-could-seriously-imperil-life/?utm_source=EHN&utm_campaign=3523fc7d22-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_8573f35474-3523fc7d22-99032769> |
| 9 | 17 | 10 Mar | MID-TERM | Avol |  |
|  | 18 | 12 Mar | Population Change | Avol |  |
| 10 |  | 17 Mar | SPRING BREAK | -- | SPRING BREAK  (NO CLASSES) |
|  |  | 19 Mar | SPRING BREAK | -- | SPRING BREAK  (NO CLASSES) |
| 11 | 19 | 24 Mar | “What Did I Miss?” | Avol |  |
|  | 20 | 26 Mar | Disease Outbreaks | Avol | Climate Change & Disease (article from EHP, 2011) [posted on Blackboard];  Chapter 8, Climate and its Impacts on Vector-Borne and Zoonotic Diseases, in course text, *Global Climate Change and Human Health*, (Luber and Lemery)  Climate Change & Infectious Disease (~46min), <https://www.youtube.com/watch?v=BfBF0iPQRCo> |
| 12 | 21 | 31 Mar | Antibiotic Resistance & “Super-Bugs” | Avol | QUIZ 7  <http://www.wired.com/wiredscience/2014/03/serious-resistant-infections-increasingly-found-children/#more-595271>;  (TED Talk on antibiotic resistance): <https://www.ted.com/talks/maryn_mckenna_what_do_we_do_when_antibiotics_don_t_work_any_more> |
|  | 22 | 02 Apr | The Sky is Falling: Volcanic Eruptions & Asteroid Collisions | Avol | <http://volcanoes.usgs.gov/hazards/gas/climate.php>;  <https://www.ted.com/talks/david_keith_s_surprising_ideas_on_climate_change> |
|  |  |  |  |  |  |
| 13 | 23 | 07 Apr | Waste Management | Avol | QUIZ 8  <http://www.waste-management-world.com/articles/print/volume-11/issue-2/features/waste-management-2030.html> |
|  | 24 | 09 Apr | Climate Responses Around the World | Students | QUIZ 9 |
| 14 | 25 | 14 Apr | What are WE doing to prepare for the “change”? | Avol & Students |  |
|  | 26 | 16 Apr | COP21 to COP25: What they were & why they matter | Avol& Students | <https://www.wri.org/blog/2019/12/cop25-what-we-needed-what-we-got-whats-next> |
| 15 | 27 | 21 Apr | Earth Day Teach In | Avol & Students | Earth Day Teach-In! |
|  | 28 | 23 Apr | TBD |  |  |
| 16 | 29 | 28 Apr | TBD |  |  |
|  | 30 | 30 Apr | Course Wrap-Up | Avol & Students |  |

**USC Scheduled Final for this Course Time: Tues May 12 from 11am to 1pm**