SIO 116 – Climate Change and Global Health

Tarik Benmarhnia
Scripps Institution of Oceanography

Office: MESOM #243
Phone: 619 674 8599
Office hours: After Class and by appointment
Email: tbenmarhnia@ucsd.edu

Time: Tue/Thu 2:00pm-3:20pm
Room: Nierenberg 101

Course Short Description:

Climate change is the biggest global health threat of the 21st Century. This course will describe the links between our climate and population health in different contexts around the globe. The course will be organized into two sequences as follows:

1. Climate Change and Global Health: Understanding the mechanisms
<u>Covered Topics:</u> *Climate change in our society; Understanding anthropogenic climate change; The direct and indirect links between climate change and health covering different topics such as extreme weather events such as extreme heat or wildfires, vector borne diseases, population migration, mental health, urban planning and air pollution, food security or COVID-19.*

2. Responding to Climate Change: Possible solutions
<u>Covered Topics:</u> *Environmental and climate Injustice; Equity in public health policies; introduction to mitigation and adaptation policies; Adaptation case studies: including heat warning systems, greening strategies, transportation and active mobility; low emission zones ; The notion of public health co-benefits of climate change mitigation: health in all policies*

The course participation will be an important component of this course.
Students will be evaluated through 4 components:

- Group Presentation [on Week 6] – 30%
    - Students in groups of 4-5 will be assigned special topics, based on readings that they will be responsible for discussing in specially designated weekly discussion sessions
- One Written Assignment [flexible deadline] – 25%
    - Option #1 – Scientific News Paper (guidelines will be posted on Canvas)
    - Option #2 – Climate and Health quantitative analysis in California (discussed individually with each student)
- Final Photo Voice Project – 25%
    - Guidelines will be posted on Canvas and discussed in class
- Class participation – 20%

There is no prerequisite for this course.

Class Schedule:

Week and dates	Topic
Week 1 - Jan 7, 9	**Introduction to the course and overview of the quarter** **The Scientific Consensus on Climate Change [class discussion with assigned readings]**
Week 2 – Jan 14, 16	**Understanding anthropogenic climate change [Guest Lecturer: Alexander Gershunov]** **The environment as a social determinant of health**
Week 3 – Jan 21, 23	**Introduction to Environmental Health and Toxicology** **Introduction to Epidemiology and Causal Inference**
Week 4 – Jan 28, 30	**Environmental Epidemiology in practice #1** **Environmental Epidemiology in practice #2**
Week 5 – Feb 4, 6	**Introduction to remote sensing [Guest Lecturer: Armin Schwartzman]** **Modelling environmental exposures [Guest Lecturer: Rosana Aguilera]**
Week 6 – Feb 11, 13	**Group Presentations**
Week 7 – Feb 18, 20	**Environmental and Climate Justice** **EJ case studies**
Week 8 – Feb 25, 27	**An overview of policies to address Climate change and its impacts** **No Class**
Week 9 – Mar 4, 6	**Designing, implementing and evaluating adaptation strategies** **The links between COVID-19 and Climate Change**
Week 10 – Mar 11, 13	**Public health co-benefits of mitigations policies** **Summary**
Date TBD	**Final Photo Voice Presentations**

Selected Readings

No textbook is required for this course
Assigned readings will be posted a few days before each class
Below is a selection of some readings that will be discussed in class

- Oreskes, N. (2004). The scientific consensus on climate change. Science, 306(5702), 1686-1686.
- Weaver, A. J., & Zwiers, F. W. (2000). Uncertainty in climate change. Nature, 407(6804), 571-572.
- Romanello, Marina, et al. "The 2024 report of the Lancet Countdown on health and climate change: facing record-breaking threats from delayed action." The Lancet 404.10465 (2024): 1847-1896.
- McMichael, A. J. (2013). Globalization, climate change, and human health. New England Journal of Medicine, 368(14), 1335-1343.
- Ebi, Kristie L., et al. "Extreme weather and climate change: population health and health system implications." *Annual review of public health* 42.1 (2021): 293-315.
- Knowlton, K., Kulkarni, S. P., Azhar, G. S., Mavalankar, D., Jaiswal, A., Connolly, M., ... & Sanchez, L. (2014). Development and implementation of South Asia's first heat-health action plan in Ahmedabad (Gujarat, India). International journal of environmental research and public health, 11(4), 3473-3492.
- Cheng, J. J., & Berry, P. (2013). Health co-benefits and risks of public health adaptation strategies to climate change: a review of current literature. International journal of public health, 58(2), 305-311.