



Climate Change

Lecturer: Dr Shimrit Maman

3 hours once a week. 3 credits. Undergraduate.

Course description

This introductory course aims to provide students with an integrated overview of the science of climate change through various aspects: physical and anthropogenic. The science of climate change will be presented, drawing attention to state of the art research and technologies. Diplomatic and policy efforts and trends will be discussed. And lastly, social changes, adaptation and activism issues that will be presented and analyzed.

GRADING

Your performance in this class will be assessed through discussion, writing, and a presenting your final project. Assessments are determined by several components, including:

Class assignment	10%
Project	40%
Final exam	40%
Participation, attendance, punctuality	10%

SYLLABUS

Lecture 1- Introduction and the History of Climate Science

- Course overview, expectations and learning styles
- Climate change: Knowledge, beliefs and our own behavior
- History of climate change science: "When did this discussion start?"

Lecture 2+3 - Contemporary Climate

- The physical basis of climate change and key terms
- The atmosphere and earth's energy budget
- Global carbon cycle
- The industrial revolution and 20th century warming – fossil fuel, CO₂ and temperature
- The science behind anthropogenic climate change
- Anthropogenic Climate change or Natural Oscillations?



Lecture 4 – The science of climate history (Paleoclimate)

- Reconstructing climatic records

Lecture 5 – Future predictions and trends: Mitigation and Adaptation

- Climate modeling and scenarios
- Observed and Potential Impacts of climate change
- Climate change here and now: Local and global Environmental Impact of Climate Change

Lecture 6+7 – Trip to the Earth and Planetary image facility (BGU)

- Satellite imagery for Direct and Indirect measurements of climate change
- Wind Streaks as planetary climate indicators – **class assignment**.
- BGUSAT – Scientific and technical mission, receiving station.

Lecture 8 – International Climate Policy: global and regional aspects

- The Politics of Climate Change
- International accords on climate change
- Israel's climate initiatives

Lecture 9 - Science vs politics

- Movie: "The Great Global Warming Swindle"
- Alternative explanations to recent warming
- Are scientists frightening us for no reason?

Lecture 10 – Global Warming, media, critique and public discourse

- Global warming, press and public discourse
- Demographic change and carbon emissions
- Consumption, transportation, diet and agriculture
- Carbon Footprint

Lecture 11– Science and policy: Energy production, carbon sequestration and geo-engineering (guest lecturer: Dr. Tareq Abu Hamed)

- Alternative energy production
- Energy conservation and efficiency
- Carbon sequestration and afforestation
- Geo-engineering



Lecture 12 – Student presentations

Lecture 13 – Is green the new black?

- How concerned about climate change are we?
- Bringing together modeling, theory, and observation to understand cause and effect
- Course conclusions

COURSE READINGS

- Dessler, A.E. and E. A. Parson. 2010. *The Science and Politics of Global Climate Change: A Guide to the Debate*. Cambridge University Press. Cambridge, England. (*note that the current page numbers refer to the 2006 version*)
- IPCC, 2014. *Climate Change 2014–Impacts, Adaptation and Vulnerability: Regional Aspects*, Cambridge University Press.
- Jones, PD; Trenberth, KE; Ambenje, P; Bojariu, R; Easterling, D; Klein, T; Parker, D; Renwick, J; Rusticucci, M; Soden, B., 2007. Observations: surface and atmospheric climate change. *Climate change*, 235-336.
- Jun Yang, Peng Gong, Rong Fu, Minghua Zhang, Jingming Chen, Shunlin Liang, Bing Xu, Jiancheng Shi & Robert Dickinson, 2013. The role of satellite remote sensing in climate change studies., *Nature Climate Change* 3, 875–883.
- Lobell, D.B.; Burke, M.B.; Tebaldi, C.; Mastrandrea, M.D.; Falcon, W.P.; Naylor, R.L. 2008. Prioritizing climate change adaptation needs for food security in 2030. *Science*, 2008, 319, 5863, 607-610, United States.
- Oreskes, N. 2004. Beyond the ivory tower: The scientific consensus on climate change, *Science*, 2004, 306, 5702, 1686, United States.
- Poortinga, Wouter; Spence, Alexa; Whitmarsh, Lorraine; Capstick, Stuart; Pidgeon, Nick F., 2011. Uncertain climate: An investigation into public scepticism about anthropogenic climate change., *Global Environmental Change*, 21, 3, 1015-1024.