

**OLLI West Winter Term,
DETAILED Syllabus – 11/18/2018**

Please go to http://denverclimatestudygroup.com/?page_id=24 for revisions/updates

**Earth's Climate: Past, Present and Future; Concerns and Solutions
Wednesdays 1:00 - 3:00 from Jan 23rd - Mar 13th, 2019**

Facilitator: Paul Belanger: pebelanger@glassdesignresources.com; 303-249-7966

If you are unable to attend the first session, please notify the facilitator by email or phone.

Classroom Assistant: TBD

Course description – 4th time: go to http://denverclimatestudygroup.com/?page_id=24

- to find UPDATED class description from this version (it will be labeled “updated”)
- references,
- links
- and the slides and weekly updates as we go along

Class Type: Illustrated Lectures/Discussion

I used to lead a field trip to National Ice Core Lab located at USGS in Lakewood, <http://icecores.org/>. Due to distance I can only offer coordination with the facility for those interested on a non-class day – see me first class day.

Materials Fee: None

Strongly recommended reading: read or be familiar with concepts presented in the following book:

What We Know About Climate Change by Kerry Emanuel, 2nd Edition 2012, 120 pages — An outline of the basic science of global warming and how current consensus has emerged.

1. Wednesday 1-3, January 23rd :

Introduction/Key principles of climate change

- The difference between weather and climate
- Climate system: feedbacks, cycles and self-regulation (climate, not government)
- What determines Earth's climate
- Might start Earth's past and finish next week

2. Wednesday 1-3, January 30th:

Earth's past

- Earth's deep past before the Cambrian (600 MaBP): hot and cold
- Earth's past: Cambrian onward: mostly hot-house Earth; 100s to 1000s parts per million (ppm)
- Climate trend in the Cenozoic – the last 65 million years; proxy data from 3600ppm to <200 ppm.
- More recent past: 180-280 part per million; how do we know – empirical data. Preview of next week's field trip

- Today: 410 ppm and growing ~3ppm/year

3. Wednesday 1-3, February 6th:

Earths present and future - ocean acidification, rates of change & modeling

- Future projections and feedbacks:
- Models
- Rates of change: analogs and various comparisons to the past
- IPCC Fifth Assessment report (AR5): <http://www.ipcc.ch/report/ar5/>
- The Pope's encyclical: google it or go here http://denverclimategroup.com/wp-content/uploads/2014/10/2015.05.24-papa-francesco_20150524_enciclica-laudato-si.pdf

4. Wednesday 1-3, February 13th:

Welcome to the Anthropocene

Possible Guest speaker, Bob Reynolds: The Anthropocene

5. Wednesday 1-3, February 20th:

- Antarctic ice cores
- Arctic Ice cores
- What the data tells us
- Signs of climate change/how has it changed: ocean acidification, Arctic warming
- Global carbon emissions of Carbon dioxide (CO₂) and Methane (CH₄)

Solutions – start of discussion May 11th onward

6. Wednesday 1-3, February 27th:

TBD

See http://denverclimategroup.com/?page_id=24 for updated info

7. Wednesday 1-3, March 6th:

Denial and Solutions Part A:

- **Denial 101x:**
- here's a link to a newly available self-paced version of the course I took in April and May: <https://www.edx.org/course/making-sense-climate-science-denial-ugx-denial101x-0>
- Climate Intervention Proposals aka Geoengineering:
 - Solar Radiation Management (SRM)
 - and Carbon Dioxide Removal (CDR)
- Economics:
 - economics of doing nothing vs. the economics of mitigation: Lomborg, Stern, Nordhaus
- **Game changers for taking Carbon out of the atmosphere:** existing technologies/promise, but at what cost? (One might be surprised).
- Biochar vs. BECCS solutions

8. Wednesday 1-3, March 13th:

Solutions, part B; conclusion

- It's not about climate change as much as sustainability
- **Game changers: Energy solutions**
- Urban heat islands

- Food security
- Population growth; potential refugee issue of climate change
- Your carbon footprint; what can YOU DO
- Wrap-up

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Books/Materials:

1) **see above for strongly recommended read before class---easy read**

2) **Other Optional** reading – see suggestions at bottom of the OLLI page I have for y'all at http://denverclimatestudygroup.com/?page_id=24

Don't Even Think About It: Why Our Brains are Wired to Ignore Climate Change by George Marshall 2014, 272 pages. Both available from Amazon, Barnes & Noble, Tattered Cover in book, e-book, or audible forms.

3) Slides, links, and additional resources posted on the OLLI class link at <http://www.denverclimatestudygroup.com/>.

4) Handouts

Websites on climate change:

- <http://www.skepticalscience.com/>
- <http://www.realclimate.org/>
- **The difference between Weather vs. climate:**
https://www.nasa.gov/mission_pages/noaa-n/climate/climate_weather.html
- **Difference between Climate change and global warming:**
<https://www.skepticalscience.com/climate-change-global-warming.htm> with this video: <https://youtu.be/HAF9jl6fupA>
- Full list of videos you may wish to review at your leisure:
<http://www.skepticalscience.com/denial101x-videos-and-references.html>

Some links I'd like you to investigate:

- <http://www.nybooks.com/articles/archives/2015/jun/04/new-solution-climate-club/> and
- <http://carbon-price.com/wp-content/uploads/2015-01-04-Nordhaus-ClimateClubAEA-v2-slides.pdf> (30 slides, Jan, 2015)
- <http://citizensclimatelobby.org/>

and others that I'll be updating on class web page

Mike Nelson links:

About Mike Nelson <https://cires.colorado.edu/events/creative-climate-communications-7news-mike-nelson>