

## OLLI West Winter Term, 2019

DETAILED Syllabus – 11/15/2018

Please go to [http://denverclimatestudygroup.com/?page\\_id=24](http://denverclimatestudygroup.com/?page_id=24) for revisions/updates

### **Weather & Climate: Understanding the Basics** **Tuesdays 1:00 - 3:00 from Jan 15 - Mar 5, 2019**

Facilitators: Paul Belanger; [pebelanger@glassdesignresources.com](mailto:pebelanger@glassdesignresources.com); cell 303-249-7966  
and Jim Keller; [kellerjb10@aol.com](mailto:kellerjb10@aol.com); 303 526 0867, cell 303 503 9711

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

Classroom Assistant: TBD

**Course description:** go to [http://denverclimatestudygroup.com/?page\\_id=24](http://denverclimatestudygroup.com/?page_id=24)

- to find UPDATED class description from this version (it will be labeled “updated”)
- for detailed description of the 2 DVD sets:
  - Meteorology: An Introduction to the Wonders of the Weather and
  - The Science of Extreme Weather
- references,
- links
- and the slides and weekly updates as we go along

**Class Type:** Great Courses DVD Lectures/Discussion; Meteorology Course and Extreme Weather Course; plus Illustrated Lectures/Discussion about Climate Change. We will continually interlace how it pertains to Colorado weather and associated climate change.

**Materials Fee:** None

**Recommended reading:**

- *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.
- *Colorado Weather Almanac* by Mike Nelson, chief meteorologist 7 New/KMGH-TV, Denver

#### **1. Tuesday 1-3, January 15<sup>th</sup>:**

##### **Introduction/Key principles**

- Meteorology is a branch of the atmospheric sciences which includes atmospheric chemistry and atmospheric physics, with a major focus on weather forecasting. The study of meteorology dates back millennia, though significant progress in meteorology did not occur until the 18th century.
- What will be covered in this course
- The difference between weather and climate
- Glossary of Terms Handout
  
- Lecture 2 Temperature, Pressure and Density

Reference: [https://en.wikipedia.org/wiki/Equation\\_of\\_state](https://en.wikipedia.org/wiki/Equation_of_state)

- Lecture 3 The Atmosphere – Composition & Origin

Reference: <https://www.space.com/17683-earth-atmosphere.html>

## 2. Tuesday 1-3, January 22<sup>th</sup>:

### **How the Sun Heats the Earth**

- Lecture 4 Radiation and the Greenhouse Effect  
References: <https://www.space.com/17683-earth-atmosphere.html>  
[https://en.wikipedia.org/wiki/Electromagnetic\\_spectrum](https://en.wikipedia.org/wiki/Electromagnetic_spectrum)
- Lecture 5 Sphericity, Conduction & Convection  
Reference: <http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/heatra.html>
- Lecture 6 Sea Breezes and the Santa Ana  
Reference: [https://en.wikipedia.org/wiki/Santa\\_Ana\\_winds](https://en.wikipedia.org/wiki/Santa_Ana_winds)

## 3. Tuesday 1-3, January 29<sup>th</sup>

### **Clouds, Moisture & Lapse Rates**

- Lecture 7 An Introduction to Atmospheric Moisture  
Reference: <https://en.wikipedia.org/wiki/Humidity>
- Lecture 8 Bringing Air to Saturation  
Reference: <https://en.wikipedia.org/wiki/Humidity>
- Lecture 9 Clouds, Stability and Buoyancy Part 1  
References: <https://www.britannica.com/science/lapse-rate>  
[https://en.wikipedia.org/wiki/Lapse\\_rate](https://en.wikipedia.org/wiki/Lapse_rate)

## 4. Tuesday 1-3, February 5<sup>th</sup>:

### **More Clouds, More moisture and Wind**

- Lecture 10 Clouds, Stability and Buoyancy Part 2
- Lecture 11 Whence and Wither the Wind  
Reference: <https://stratus.ssec.wisc.edu/courses/gg101/coriolis/coriolis.html>  
<https://www.britannica.com/science/Coriolis-force>
- Lecture 13 Global Atmospheric Circulation  
Reference: [https://en.wikipedia.org/wiki/Atmospheric\\_circulation](https://en.wikipedia.org/wiki/Atmospheric_circulation)

## 5. Tuesday 1-3, February 12<sup>th</sup>:

- Lecture 14 Fronts & Extratropical Cyclones  
Reference: [http://www.nws.noaa.gov/outlook\\_tab.php](http://www.nws.noaa.gov/outlook_tab.php)
- Lecture 15 Middle troposphere, Troughs and Ridges  
Reference: e: [http://www.nws.noaa.gov/outlook\\_tab.php](http://www.nws.noaa.gov/outlook_tab.php)
- Lecture 16 Wind Shear: Horizontal & Vertical  
References: <https://www.wunderground.com/education/shear.asp>

<https://www.faasafety.gov/> see

[https://www.faasafety.gov/gslac/ALC/libview\\_normal.aspx?id=56407](https://www.faasafety.gov/gslac/ALC/libview_normal.aspx?id=56407)

<https://www.faasafety.gov/.../FAA%20P-8740-40%20WindShear%5Bhi-res%5D%20b...>

## 6. Tuesday 1-3, February 19<sup>TH</sup>

- Lecture 17 Mountain Influences on Atmosphere  
Reference: <https://www.mountaineering.ie/hillwalking/Weather/part3/default.aspx>
- Lecture 18 Thunderstorms, Squall Lines and Radar  
References: [http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/svr/modl/line/squall.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/svr/modl/line/squall.rxml)  
[https://en.wikipedia.org/wiki/Squall\\_line](https://en.wikipedia.org/wiki/Squall_line)
- Lecture 19 Supercells, Tornados and Drylines  
References:  
[http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/svr/type/spr/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/svr/type/spr/home.rxml)  
<https://www.weather.gov/ama/supercell>

## 7. Tuesday 1-3, February 26<sup>th</sup>

- Lecture 20 Oceans Influence on Weather & Climate  
Reference: <https://oceanexplorer.noaa.gov/facts/climate.html>
- Lecture 21 Tropical Cyclones  
Reference: <https://www.britannica.com/science/tropical-cyclone>
- Lecture 22 Light & Lightning  
Reference: <https://en.wikipedia.org/wiki/Lightning>

## 8. Tuesday 1-3, March 5<sup>th</sup>

- Lecture:
  - a. Climate Change & Global Warming
  - b. Wrap-up

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### 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](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>

### Mike Nelson links:

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

- **January 2017 – nothing new but needs to be taken seriously:**  
<https://www.thedenverchannel.com/news/local-news/mike-nelson-climate-change-talk-is-nothing-new-but-should-be-taken-seriously-now-more-than-ever>
- **October 2017 – we are the cause of warming:**  
<https://www.thedenverchannel.com/weather/weather-blogs/mike-nelson-the-planet-is-getting-warmer-and-we-are-the-cause>
- **May 2017 with Mike Denning:** <https://www.thedenverchannel.com/weather/mike-nelson-discusses-climate-change-global-warming-with-csu-climate-scientist-scott-denning>