Weather, Climate, & Change

GEOL 100- Fall 2018

Monday 11:00 - 12:50 p.m. **Wednesday/Friday 11:00 - 11:50 a.m.**

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THE BIG QUESTIONS

How's the weather?

It's a simple question, but understanding & predicting the weather is both a complex endeavor that's critical to the modern world.

Is the climate changing?

It's a timeless question, and a question that's woefully misunderstood by both the public and policymakers alike.

PREAMBLE

If you find these questions interesting then you're in the right class. The boundary conditions for humanity and its history are set by the Earth's weather and climate. The course starts with the physical and chemical processes at work in the atmosphere to create weather; we'll study both everyday weather and extreme weather. Once we've learned about weather, we'll focus on the longer time scale that encompasses climate and examine why climates on the Earth are so variable. Although climates have changed throughout Earth's long history, there is much concern about current and future climate change, its causes, and the impact on human society. In this class you'll hone your abilities at thinking spatially, quantitatively, and critically. We'll also endeavor to effectively communicate both *what we know* & *how we know it* to different audiences (scientists, peers, & the public) and with a bevy of media.

The Course Plan

Week	*Date*	*Topics & Assignments*	*Readings*
1	**Aug 29 - 31**	Overview & Goals, Seeing the Weather	Ch. 1
2	**Sept 3 - 7**	Our Place in the Sun: Energy, Insolation & the Seasons	Ch. 2, 3
3	**Sept 10 - 14**	Atmospheric Moisture & Clouds, The Meteorologist's Toolbox	Ch. 4 - 6
4	**Sept 17 - 21**	When it Rains, it Pours… Producing Precipitation	Ch. 6, 7
		Sept. 21- 23 Geology Dept. Field Trip- *Almost Heaven, West Virginia (OPTIONAL))*	
5	**Sept 24 - 28**	Blowing in the Wind: Atmospheric Circulation *Problem Set #1 due Fri., Sept. 28th*	Ch. 8 - 11
6	**Oct 1 - 5**	Severe Weather: When All Hell Breaks Loose	Ch. 12, 14, 15
7	**Oct 8 - 12**	A World Tour: Global Climate Zones *Hurricane Presentation Mon., Oct. 8th*	Ch. 17
	Oct 13 - 16	**Fall Break**	
8	**Oct 17 - 19**	Blame it on the Weathercaster! Weather Forecasting	Ch. 13
9	**Oct 22 - 26**	What Controls Global Climates? *Showing off your Weather Video Snippet- Fri., Oct. 26th*	Ch. 17

10	**Oct 29 – Nov 2**	Climate Change- The Record from the Past	Ch. 16
11	**Nov 5 - 9**	Climate Change- The Public 'Debate' ***Mid-Term Exam- Mon., Nov. 5th***	BB readings
12	**Nov 12 - 16**	Climate Change- What's Going on Today *Group Climate Project Presentations- Nov. 14 & 16th*	BB readings
13	**Nov 19**	General Circulation Models - GCMs	
	Nov 21 - 25	**Thanksgiving Break**	
14	**Nov 26 - 30**	Climate Change - Future Outlook *Problem Set #2 due Fri., Nov. 30th*	BB readings
15	**Dec 3 - 7**	Realities of Changing Climate - Science, Policy, & People	BB readings

Final Exam: Wednesday, Dec 19th, 9:00 a.m. - noon

Grading -

Mid-term Exam	15%	Presentations to Peers	5%
Final Exam	30%	Hurricane Presentation	5%
Problem Sets	20%	Weather Video Snippet Project	5%
In-Class/ Lab Activities	10%	Climate Group Research Project/Presentation	10%

Problem Sets - Meteorology and climatology are quantitative endeavors- the problem sets will hone your quantitative skills to a sharp edge. Start working on the problems early and come by my office if you have questions. You may consult with your classmates and discussion is encouraged, however do not let your peers do the work as the exams will involve quantitative problems as well.

In-Class Activities - This class is far more than just a lecture, and during almost every class there will be in-class activities designed to not only keep you awake, but also to get you thinking and make you an active participant in learning. Some of the questions/exercises will be similar to those on problem sets and exams.

Weather & Climate Video Snippet Project - In this class we'll learn to observe and infer the weather and a region's climate by interpreting short (<1 min.) videos that feature a 360˚ panorama of both the sky and horizon. For this project you'll create and curate your own video to add to our growing video snippet collection.

Group Climate Research Project/Presentation - The Group Climate Project is focused on learning about the weather and climate of an exotic location. You'll also discuss the possible impacts that climate change may bring to the region.

Textbook - *Meteorology Today* by Ahrens, 2013, (10th *edition*). ***HERE IS THE DEAL:*** older editions of the textbook (8th or 9th edition) will work just fine and are much less expensive. Assigned readings should be read during the week in which the material will be discussed. Other ancillary readings will be posted online (BB readings) as needed.

Web Resources - Course materials are posted on Blackboard- *http://blackboard.wm.edu/*. These will include class presentations/lectures, links to websites, assignments, answers keys, and additional readings (BB readings).

Office Hours - My formal office hours are ***Tuesday from 1 to 4 p.m.***- I'll be in my office (Mc-Street Hall 215) during that time. Feel free to contact me to arrange other meeting times.

Our Class Community: I welcome the broad range of backgrounds that W&M students bring to this course. It's our individual and collective responsibility to create a respectful, cooperative, and inclusive classroom environment for everybody, regardless of race, ethnicity, nationality, culture, religion, political beliefs, gender, gender identity / expression, sexual orientation, age, disability, or marital, parental or veteran status.