Weather, Climate, & Change

GEOL 100- Fall 2017

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

C. M. Bailey

Office- *McStreet Hall 215* Office #- *x1-2445* Email: *cmbail@wm.edu*

THE BIG QUESTIONS

How's the weather?

It's a simple question, but understanding and predicting the weather is a complex and multifaceted 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 30 - Sept 1**	Overview & Goals, Seeing the Weather	Ch. 1
2	**Sept 4 – 8**	Our Place in the Sun: Energy, Insolation & the Seasons	Ch. 2, 3
3	**Sept 11 - 15**	Atmospheric Moisture & Clouds, The Meteorologist's Toolbox	Ch. 4 - 6
4	**Sept 18 - 22**	When it Rains, it Pours… Producing Precipitation	Ch. 6, 7
5	**Sept 25 - 29**	Blowing in the Wind: Atmospheric Circulation *Problem Set #1 due Mon., Sept. 25th*	Ch. 8 - 11
		Sept. 29-30th GEOLOGY DEPARTMENT TRIP to the JAMES RIVER (optional)	
6	**Oct 2 - 6**	Severe Weather: When All Hell Breaks Loose	Ch. 12, 14, 15
7	**Oct 9 - 13**	Blame it on the Weathercaster! Weather Forecasting *Climate Research Team & Topic selected by Fri., Oct. 13th*	Ch. 13
	Oct 14 - 17	**Fall Break**	
8	**Oct 18 - 20**	A World Tour: Global Climate Zones	Ch. 17
9	**Oct 23 - 27**	The Controls on Global Climates ***Mid-Term Exam-a-roo: Mon., Oct. 23rd***	Ch. 17

10	**Oct 30 – Nov 3**	Climate Change - The Record from the Past *Weather video project due and short presentation, Oct. 30th*
11	**Nov 6 - 10**	Climate Change - Current Perspectives
12	**Nov 13 - 17**	***Group Climate Project Presentations***
13	**Nov 20**	General Circulation Models - GCMs *Group Climate Project – final presentation uploaded by Tues., Nov. 21st*
	Nov 22 - 26	**Thanksgiving Break**
14	**Nov 27 - Dec 1**	Climate Change - Future Outlook *Problem Set #2 due Fri., Dec. 1st*
15	**Dec 4 - 8**	Realities of Changing Climate - Science, Policy, & People
		Final Exam: Tuesday, Dec 12th, 9:00 a.m. - noon

Grading -

Mid-term Exam	15%	Weather Video Snippet Project	5%
Final Exam	30%	Other Presentations to Peers	5%
Problem Sets	20%	Climate Group Research Project/Presentation	15%
In-Class/ Lab Activities	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 an important crop (from Avocados to Wheat) and the climate/weather that controls its distribution. You'll also discuss the possible impacts that climate change may bring to the crop's distribution.

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 and 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 ancillary readings.

Office Hours - My formal office hours are Wednesday 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.