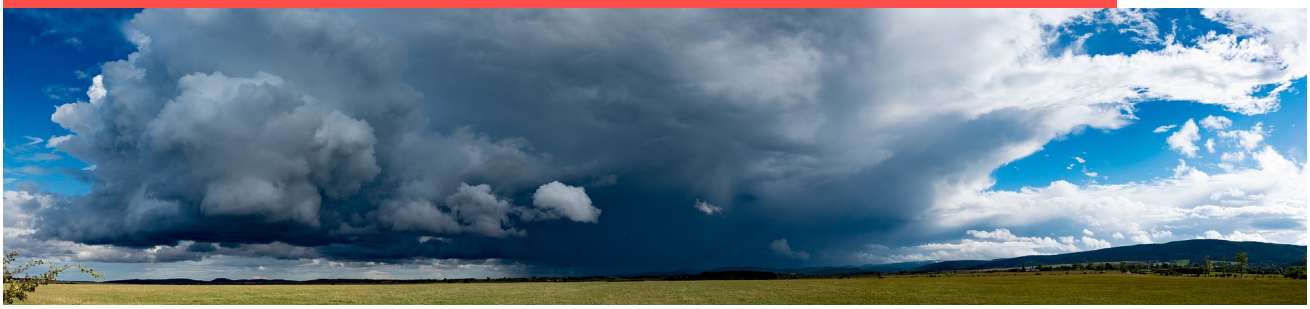
GEO 2242

Extreme Weather



In this class we will learn the scientific fundamentals of Earth's atmosphere and weather systems, and gain understanding of how Earth's climate system operates. We will learn about energy balances, global and regional circulation, airmasses, fronts, and storms. We will discuss weather modeling and forecasting, and evaluate how Earth's climate is changing. Throughout, we will consider the impacts of weather and climate on society and the natural environment.

Time: Monday, Wednesday and Friday 12:50 pm to 1:40pm (Period 6); Fall 2018

Location: LIT 0109

Materials: You have the option of two textbooks. It is recommended that you have one of these, but neither are required:
Exploring Physical Geography (2nd Edition), by Reynolds et al. Use this if you plan to major in Geography/Geology/Environmental Sciences…
Understanding Weather and Climate (4th Edition and up), by Aguado and Burt. Use this if you have a particular interest in meteorology/climate.

Course notes will be supplied through https://elearning.ufl.edu/. The notes will be comprehensive, but the books will provide helpful supplementation, and are a good investment for those who plan to major in a related field.

Corequisite: None

Instructor

Dr. Esther Mullens, emullens@ufl.edu
Main office: Turlington Hall, Geography Department, Room 3122

Office hours: Tentatively Mondays and Wednesdays 3-4pm. I am willing to adjust based on class feedback. For individual appointments outside of these times, please email. I will try and accommodate you as my schedule permits.

Teaching Assistants: TBC.

Structure

This is a lecture-based class. Important material will be covered in every class. We will use a combination of slide-based lectures and some multimedia presentations and in-class activities. I will point to the relevant text in the recommended textbooks for additional reading. It is my goal to supply you with the relevant class notes at least 2 days prior to the class. Please be prepared to read and retain those notes. I advise that you listen well during class and take good notes for yourself. Homework assignments and quizzes are designed to synthesize material from the lectures and text. The subject of weather and climate cannot be fully appreciated without the synthesis of the many topics we learn about throughout the semester. This course will cover an abundance of material; therefore, it is particularly important that you keep up with the readings, quizzes, and homework as well as attending class regularly.

Policy on Notes

There are many introductory meteorology courses of this nature, and so there many be many notes floating around online. However, the notes I will provide you, as well as information from legitimate subject-relevant textbooks will be considered as the final authority on matters of grading.

Overarching Goals

- Students should be able to describe, identify, and become familiar with the concepts, terminology, and tools pertaining to basic meteorology. This includes: (1) the major components of Earth's climate system, such as atmospheric composition, how solar radiation and terrestrial radiation are exchanged and emitted. How seasons work, How solar radiation drives global circulation, and the distribution of temperature across the planet. (2) How moisture is distributed globally, humidity, atmospheric stability, and the formation of clouds and precipitation. (3) Air pressure, global and regional circulation, air masses, fronts, and jet streams. (4) Hazardous weather, including thunderstorms, tornadoes, strong winds, winter storms, tropical cyclones. (5) The causes and implications of climate change both globally and regionally.
- Students, when provided with a forecast from a weather model, should be able to identify some basic quantities on the map, and understand generally what the prediction is for that region (e.g., for precipitation, potential for severe weather).
- Students should be able to describe how extreme weather and climate variability and change impact societies in their region (e.g., Florida), and elsewhere.

Grading

The final grade will be calculated based on the following:

Homework/Quizzes (lowest 3 grades dropped*)	**40%**
In-class Quizzes & Participation (3 lowest dropped)	**15%**
Exams (3 exams)	**45%**
TOTAL	**100 %**

***based on 8 H/W + syllabus test**

There are NO OPPORTUNITIES FOR EXTRA CREDIT.

Percentages necessary to earn a given final grade are as follows:

A	**90%**	**D**	**60%** (< **63 D-**, >**67 D+**)
B	**80%** (< **83 B-**, > **87 B+**)	**F**	<**60%**
C	**70%** (<**73 C-**, >**77 C+**)		

Grades will be supplied through Canvas as we work through the semester. I retain the right to adjust the final grades (e.g., 'curve') based on the distribution of scores from the class. It is your responsibility to keep track of your grade and come to me if you are struggling with the material.

Quizzes

Homework quizzes will be available online through Canvas by 5 PM on the day of lecture and will close 3-days later. At midnight. In-class quizzes will occur once per week throughout the semester. I will not provide the date of the in-class quiz in advance. The two (2) lowest in-class quiz grades will be dropped (for missing classes due to illness, academic or athletic events, funeral, etc.). Quizzes will benefit those students who attend class regularly. There will be no makeup homework exercises or quizzes. No late work will be accepted unless an extension is approved due to special circumstances (illness, family emergency…).

Exams

There will be three exams. Exams are not cumulative. In other words, we will test on the material to that point in the semester for exam 1, and then the subsequent exams test on the material between the prior exam and the one being taken. The last of the regular exams will be held when the final exam is scheduled.

Tentative Outline (Note that precise dates may change, I will update as we go). The dates shown start a new subject section, or highlight key dates, such as exams or no-class.

Date	Course Material
22 Aug	Preliminaries and Introduction to Course
24 Aug	The Atmosphere: Radiation Budget, Composition, Energy and Temperature
3 Sep	*Labor Day (NO class)*
5 Sep	Atmospheric Moisture
12 Sep	Clouds and precipitation
19 Sep	Wind and Pressure
26 Sep	**Exam 1**
28 Sep	Air Masses, Fronts and jet streams
3 Oct	Weather Systems: Mid-latitude storms
8 Oct	Weather Systems: High-latitude weather
10 Oct	Weather Systems: Tropics and subtropics

15 Oct Local weather
19 Oct. Extreme Weather: Thunderstorms
24 Oct Extreme Weather: Tornadoes
29 Oct Extreme Weather: Winter storms
2 Nov *Homecoming (NO class)*
5 Nov Extreme Weather: Floods and Drought
9 Nov **Exam 2**
12 Nov *Veteran's day (NO class)*
14 Nov Tropical Cyclones
19 Nov Exam review/in-class activities
21 & 23 Nov *Thanksgiving (NO Class)*
26 Nov. Climate Variability (e.g., teleconnections, past climates)
30 Nov. Climate Change and Impacts
5 Dec. Material review
7 Dec *Reading Day (NO Class)*
13 Dec **Final Exam Scheduled**

17 Dec **Grades Due**

A note on math content

The study of weather and climate can include some complicated Math! However, since this course is introductory, any equations that we use will be very basic, explained in detail, and provided to you in homework and/or exams (no memorization needed, although you will need to understand what the equation does). A calculator will not be required in class or for homework or exams unless I tell you in advance.

My Expectations of You

You will read materials for a particular class period either before or shortly after class.

Learning requires new connections to be established in your brain a process that requires significant effort on your part. Per the nationwide standard for university scholarship, you will study (read, review, reflect, practice, do homework) at least 2 hours for every hour you are in lecture.

Your attendance is not mandatory, however to get a full learning experience, and to succeed in this course, you should make attending a priority.

You will turn off your cell phone. You will not text message, visit Facebook, web surf, etc. during class unless I approve you do so. If you cannot do so, then do not come to class, as these actions distract your peers from learning.

Web page

The class web page can be found at: https://elearning.ufl.edu/ . You will find presentations, assignments, exam review documents, and additional information. If you encounter any problems with the web page, please come see me.

Reasonable Accommodation

The University is committed to providing reasonable accommodation for all students with disabilities. Students requesting an accommodation must first register with the Dean of Students office Disability Resource Center (https://drc.dso.ufl.edu). This office will provide documentation for the student, who will then provide this to me. You must submit this documentation before taking any quizzes or exams (so ideally before the start of class) because the accommodation is not retroactive.

Student Conduct

You are expected to be familiar with and abide by the UF Academic Misconduct Code. Anything that appears to be cheating, plagiarism, or other forms of academic misconduct will not be tolerated. Apparent misconduct will be dealt with by immediate referral of the circumstances through the regular University channels.

Title IX

For any concerns regarding gender-based discrimination, sexual harassment, sexual assault, dating/domestic violence, or stalking, there are resources available. To learn more or to report an incident, got to: https://titleix.ufl.edu. Also, please be advised that a professor/GA/TA is required to report instances of sexual harassment, sexual assault, or discrimination.

Drops, Absences, etc.

Should you decide to drop the course for whatever reason, you must request to do so through the appropriate channels by the appropriate date. Failing to do so will result in an F grade for the course. If at the time you withdraw from the course you are scoring a failing grade, you will receive an F grade. If not, you will receive a W for withdrawn.

It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required classwork that may fall on religious holidays. Please contact me as soon as possible to make appropriate arrangements for classwork or rescheduling of exams.

If you have an emergency or illness come up that means you are unable to take the exams on their scheduled dates, please inform me as soon as you can. I will require that you have some form of documentation that confirms your situation, and will work with you to reschedule or skip if that is the only option. The only exam that cannot be rescheduled for an individual is the final.

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me as soon as possible to discuss. Generally, modifications will be made where medically necessary.

Other

I have the right to institute new policies during the semester to ensure safety and a positive learning environment for all students.