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 2019
Location: LIT 109
Materials: It is recommended but not required that you have a copy of the following text if you desire a more complete and deeper understanding of the material and/or plan to major in a related field. Understanding Weather and Climate (4th Edition and up), by Aguado and Burt. Supplemental reading options will be provided from that text. However, the course notes and other readings available via canvas will be comprehensive and cover the needed material. Course notes will be supplied through https://elearning.ufl.edu/.

iClicker technology will be used in this class. For complete participation you must use the iClicker cloud (iClicker Reef) for computer and/or smartphone, which is available through subscription. For more information: https://www.iclicker.com/pricing.

Corequisite: None
Instructor: Dr. Esther Mullens, emullens@ufl.edu
Main office: Turlington Hall, Geography Dept. Room 3138.
If you are unfamiliar with Turlington, locate my office by taking the elevators to the third floor and turning left then left again through the blue doors into the Geography department. My office is located diagonally across from the main office.

**Office hours:** *Mondays and Wednesdays 2:30-4pm.* 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, multimedia presentations, and in-class and online participation (discussions). It is my goal to supply you with the relevant class notes and readings at least 24-hours prior to the class. Please be prepared to read, print and/or retain those notes. I strongly advise that you listen well during class and take good notes for yourself. Where possible, please print your lecture notes prior to class and annotate them during class, or purchase a notepad or folder to keep all your notes for this class. You may use a laptop to take notes, however please do not surf the web unless I ask you to do so. Research has demonstrated that hand-writing your notes leads to better outcomes in terms of retention and class performance, therefore I encourage you to use this approach if you are able.

Homework assignments, class participation, 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 assignments as well as attending class regularly. Your participation score and overall performance in this course will suffer if you regularly skip class.

**Policy on Notes**

There are many introductory courses of this nature, and so there may 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 will demonstrate this understanding through assignments, class activities, and exams.

- Students, when provided with a forecast from a weather model, should be able to identify some basic quantities on the map, and demonstrate general understanding of 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 (Tentative):

- **Homework** (lowest 3 grades dropped) - 30%
- **Class exercises/quizzes, participation** (5% online, 15% in class) - 20%
- **Individual Project(s)** - 20%
- **Exams** (2 exams Midterm@ 10%, Final@ 20%) - 30%

**TOTAL** 100%

There are NO OPPORTUNITIES FOR EXTRA CREDIT.

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

- **A** >=90%
- **D** 60% (60-62.99 D-, 66-69.99 D+), 50% (50-54.99 D, 56-59.99 D+)
- **B** 80% (80-82.99 B-, 86-89.99 B+), **Fail** <60%
- **C** 70% (70-72.99 C-, 76-79.99 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 OR maintain grades as is, depending on the overall statistics of class performance. I will provide you with an explanation of my decision in either case.

Asking for help - instructor and student responsibilities
I recognize that the vast majority of you are in this course to meet a requirement. However, I still expect you to have integrity in your work, and to try your best. I also recognize that most of you have a lot of demands on your time. However, so do I. If you find yourself struggling, you must arrange to come and see me. I am very willing to assist, but I will not be chasing you. Your grade is your responsibility.

If you require assistance, the best way to contact me is after or before class, via email, or by showing up to office hours. Please note that I have a strict policy with respect to after-hours contact. I DO NOT typically respond to emails sent after 5.30pm M-F or on the weekends until the next business day, and this includes nights before the exams! Please plan accordingly. I will always try to respond within 24 hours if your email is sent within the work day, and usually I respond within an hour. If more than 24 hours goes by, please re-send. Please always address me as ‘Dr’ or ‘Professor’ Mullens.

Quizzes
Homework quizzes will be available online through Canvas by 5 PM on the day of class and will close one week (7-days) later. In-class graded quizzes and participation will occur regularly throughout the semester and will utilize iClicker technology. You can expect that most classes will include quiz material that will form a large portion of your participation grade, and a rubric for in-class grading will be supplied to you shortly after the start of the semester. You may miss up to 3 class periods without penalty to your participation grade (for missing classes due to illness, academic or athletic events, funeral, etc.). It is good policy to let me know regarding absences when they are planned or anticipated. There will be no makeup homework exercises or quizzes unless the circumstances warrant it, which is at my discretion. No late work will be accepted unless an extension is approved in advance due to special circumstances.

Readings
Readings are there for your benefit, to help you gain a deeper understanding of the material beyond the class room. Supplemental reading and resources are provided on Canvas. If you have purchased the textbook, then you may skip the Canvas readings and focus on the relevant text which is supplied for you at the end of every lecture. The
material from these readings is included in your assessments and so you are strongly recommended to read all applicable material in each module.

Online discussions
We will be engaging in online discussions related to the course content. These discussions exist to help you ask and answer questions with your peers based on the information you are learning throughout the semester. More information on discussion activities will be provided at the start of the semester.

Project
Each student will create an individual blog that examines the weather and climate of a specific region of the world. You will be required to post an article once every two weeks. More guidelines on this project, including selection of locations, rubrics, and expectations will be provided at the start of the semester and available for you on Canvas.

Exams
There will be two exams. Exams are not cumulative. In other words, we will test on the material to that point in the semester for exam 1 (midterm), and then the final will 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, and it will be a longer exam and worth more of your grade. The midterm will be a multiple choice exam, and the final composed of multiple choice (75%) and short answer (25%).

Math content
The study of weather and climate can include some complicated Math! However, I intend to emphasize conceptual understanding as oppose to mathematical rigor. Any equations we use will be basic, explained in detail, and will be provided to you in homework and/or exams (no memorization needed). A calculator will not be required in class 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. Supplemental readings on Canvas or using the textbook are for your benefit. 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) for 1-2 hours for every hour you are in lecture.

You may use your phone or laptop for iClicker activities, and you may use laptops for note-taking, with the caveats that I have expressed above. Apart from Clicker activities, your phone must be out of sight and on silent. You will not text message, visit Facebook, web surf, etc. during class unless I approve you do so. If you cannot resist, just know you are doing so at the detriment of yourself and your peers. If I see inappropriate use of phones and/or laptops then I will call you out on it, and egregious misuse may lead to penalties such as inability to participate in class iClicker activities.

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. I am very willing to assist to make this learning environment appropriate to your needs, and so therefore please do contact me if there is an issue that can be rectified or improved.

Student Conduct
You are expected to be familiar with and abide by the UF Academic Misconduct Code. Sadly, plagiarism and cheating is common. Anything that appears to be cheating, plagiarism, or other forms of academic misconduct will not be tolerated. You should familiarize yourself with activities that constitute plagiarism and/or cheating, as ignorance is not an acceptable excuse. To that end, I am providing you with a list of ways that plagiarism can occur, which you will be able to view on Canvas through the entire semester. 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, go to: https://titleix.ufl.edu. Also, please be advised that a professor/GA/TA is required to report any 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 failing grade for the course.**

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 complete homework or 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. 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.

**Evaluations**
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Your feedback is valuable for the instructor in terms of helping them improve and/or providing recognition for aspects that have been done well. This feedback is used for tenure decisions, promotions etc as well as for improvement of the course. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students following the conclusion of the semester at https://evaluations.ufl.edu/results.
Other: I have the right to institute new policies pertaining to course content, structure, and assessment during the semester without advanced notice to ensure a positive learning environment for all students.

Tentative Outline (Note that precise dates and order of material 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.

**August**
21 Aug: Preliminaries and Introduction to Course
23 Aug: The Atmosphere: Composition, Radiation Budget, Energy and Temperature

**September**
02 Sep: *Labor Day* (NO class)
04 Sep: Atmospheric Moisture
11 Sep: Clouds and precipitation
18 Sep: Wind and Pressure
27 Sep: Air Masses, Fronts and jet streams

**October**
04 Oct: *No Class* (*Homecoming*)
07 Oct: Basics of Weather Forecasting
09 Oct: Mid-latitude Storms I: Structure
14 Oct: Exam Review
16 Oct: Midterm Exam
18 Oct: Mid-latitude storms II: Impacts
21 Oct: Urban meteorology and air pollution
25 Oct: Extreme Weather: Thunderstorms and tornadoes

**November**
04 Nov: Extreme Weather: Tropical Cyclones
11 Nov: *Veteran's day* (no class)
13 Nov: Extreme Weather: Floods
18 Nov: Extreme Weather: Drought
20 Nov: Climate Variability and Change
27 & 29 Nov: *Thanksgiving* (NO Class)

**December**
04 Dec: Material review
06 Dec: *Reading Day* (NO Class)
TBC Final Exam Scheduled (week of Dec 9-13)
16 Dec: Grades Due