

# MET 4301

## Atmospheric Dynamics

### Instructor

Stephen Mullens, [stephen.mullens@ufl.edu](mailto:stephen.mullens@ufl.edu)

**My office:** Turlington Hall, Geography Department, Room 3126-B (room in a room)

**Office hours:** Mondays period 5 and Thursdays periods 7-8. If you want to make an appointment, just email me. I will accommodate you as my schedule permits.

### Class times:

**Time:** Monday-Wednesday-Friday period 4, 10:40-11:30am

**Location:** Turlington Hall 3012

### Textbooks that cover our material:

Holton, James R., 2004: *An Introduction to Dynamic Meteorology*. Elsevier, 4<sup>th</sup> or 5<sup>th</sup> edition.

Bluestein, Howard, 1997: *Synoptic-Dynamic Meteorology in Midlatitudes, Volume I: Principles of Kinematics and Dynamics*. Oxford University Press.

### Course Objectives – What we’re going to cover:

- Interpret the atmospheric equations of motion and how the variables relate to each other.
- Demonstrate how to simplify the equations of motion, how to justify those simplifications, and find solutions for particular types of atmospheric phenomena.
- Recognize and state the strengths and limits of simplified solutions to the equations of motion.

### Grading Structure:

Homework assignments - 30%

Exam 1 - 25%

Exam 2 - 25%

Final Exam - 20%

### Grades:

A	90.0-100%	B+	87.0-89.9%	C+	77.0-79.9%	D+	67.0-69.9%
		B	83.0-86.9%	C	73.0-76.9%	D	63.0-66.9%
		B-	80.0-82.9%	C-	70.0-72.9%	D-	60.0-62.9%

## **Tentative Weekly Schedule**

The most up-to-date calendar will be available the Canvas home page.

Week 1 - Vectors and Order of Magnitude reasoning

Week 2 - Pressure gradient, gravitational, friction forces

Week 3 - Non-inertial reference frame, Coriolis and centrifugal forces

Week 4 – Derive equations of motion

Week 5 – Magnitude of Equations of motion terms

Week 6 - Geostrophic and Hydrostatic wind balance in rotating coordinates

Week 7 - Mass conservation equation and divergence

Week 8 - Flow types in natural coordinates

Week 9 - Types of gradient wind

Week 10 - Thermal wind & equations of motion in isobaric coordinates

Week 11 - Vorticity equation

Week 12 - vertical and horizontal vorticity tendency equations

Week 13 - Absolute and Potential vorticity

Week 14 – Quasi-Geostrophic Equations

Week 15 – Interpretation of Quasi-Geostrophic Equations

Final Exam – Thursday, 16 December, 12:30-2:30pm

## **Holidays**

15 January – Martin Luther King Jr Day

11-15 March – Spring Break

## **DISCLAIMER:**

This syllabus represents my general plans and objectives. As we go through the semester, those plans may need to change to enhance the learning opportunities for the class. Such changes are typical, should be expected, and will be clearly communicated on Canvas.

## **UF POLICIES**

### **My Expectations of You**

You will read materials for a particular class period either before or shortly after class. Learning often isn't the most joyous activity because it requires a significant effort. The nationwide standard for university scholarship says students should study (read, review, reflect, practice, do homework) at least 2 hours for every hour you are in lecture.

Though we will be doing some activities that use the internet during class, please understand that text messaging, visiting Facebook, browsing the internet, etc. during class is a major distraction from learning for your peers as well.

### **Web page**

The class web page can be found at: [elearning.ufl.edu/](http://elearning.ufl.edu/). If you encounter any problems with the web page, do something (anything!) to let the instructor know.

### **Academic Honesty**

"UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code ([sccr.dso.ufl.edu/process/student-conduct-code/](http://sccr.dso.ufl.edu/process/student-conduct-code/)) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor in this class."

### **Accommodations**

"Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester."

### **Excused Absences**

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

"In general, acceptable reasons for absence from or failure to participate in class include illness, serious family emergencies, special curricular requirements (e.g., judging trips, field trips, professional conferences), military obligation, severe weather conditions, religious holidays, and participation in official university activities such as music performances, athletic

competition or debate. Absences from class for court-imposed legal obligations (e.g., jury duty or subpoena) must be excused.”

I appreciate that unexpected events occur in all of our lives. If such events occur, and it causes you to attend an event (e.g., funeral, job interview) or a facility (e.g., doctor’s office, courthouse), then you will need to prove that you went to this event/facility on that date by providing some form of documentation of the event. An event program, a doctor’s note, or similar paperwork will suffice. Upon producing this documentation, you will be able to make up the midterm exam or any graded class activities from that date.

“A student should inform the faculty member of the religious observances of his or her faith that will conflict with class attendance, with tests or examinations, or with other class activities prior to the class or occurrence of that test or activity.”

## **Grades**

UF policies on grades and GPAs can be found at:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

## **Course Evaluation**

“Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at [gatorevals.aa.ufl.edu/students/](http://gatorevals.aa.ufl.edu/students/). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [ufl.bluera.com/ufl/](http://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [gatorevals.aa.ufl.edu/public-results/](http://gatorevals.aa.ufl.edu/public-results/).”

## **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: [titleix.ufl.edu](http://titleix.ufl.edu). 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 deadlines. You will receive a W for withdrawing. Failing to do so will result in an E grade for the course. If at the time you withdraw from the course you are scoring a failing grade, you will receive an E grade.

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