

MET 3300

Atmospheric Dynamics

Instructor

Stephen Mullens, stephen.mullens@ufl.edu

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

Office hours: Thursday period 7 (1:55-2:45pm) and Friday periods 4, 7 (10:40-11:30am, and 1:55-2:45pm). You can sign up for online or live office hours using the Canvas calendar. You can also just stop by if nobody is scheduled for that time. If you want to make an appointment at another time, just email me. I will try to accommodate you as my schedule permits.

Class times:

Time: Monday-Wednesday-Friday period 6, 12:50-1:40pm

Location: Turlington Hall 3012

This class is an in-person class. All people inside of UF facilities are expected to wear masks in community spaces (class rooms, hallways, bathrooms, etc.) in buildings. Students will have the option of attending office hours through Zoom. All absences are treated identically - with an abundance of patience to allow you to learn the material. Although masks and vaccines are not a guarantee against COVID-19, they provide strong protection against illness, hospitalization, and death. Thus, UF also urges all members of our community to get vaccinated.

Textbooks that cover our material:

Holton, James R., 2004: *An Introduction to Dynamic Meteorology*. Elsevier, 4th or 5th 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	93.0-100%	B+	87.0-89.9%	C+	77.0-79.9%	D+	67.0-69.9%
A-	90.0-92.9%	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

6 September – Labor Day

8 October – Homecoming

11 November – Veterans Day

24-26 November – Thanksgiving

9-10 December Reading Day

UF POLICIES

ACADEMIC HONESTY:

You are all bound by the student academic honor code.

“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.”

“On my honor, I have neither given nor received unauthorized aid in doing this assignment”

ACCOMMODATIONS:

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

CAMPUS RESOURCES:

- **U Matter, We Care:** If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit umatter.ufl.edu to refer or report a concern. A team member will reach out to the student in distress.
- **Counseling and Wellness Center:** For crisis or non-crisis services, visit counseling.ufl.edu or call 352-392-1575.
- **Student Health Care Center:** For 24/7 information to help you find health care visit shcc.ufl.edu or call 352-392-1161.
- **University Police Department:** 911 for emergencies, or police.ufl.edu, or call 352-392-1111.
- **UF Health Shands Emergency Room / Trauma Center:** For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road. The website is ufhealth.org/emergency-room-trauma-center.
- **Writing Studio:** Help brainstorming, formatting, and writing papers. writing.ufl.edu/writing-studio/
- **Student Complaints On-Campus:**

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>

I appreciate that unexpected events occur in all of our lives. 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, court-imposed legal obligations, and participation in official university activities such as music performances, athletic competition or debate. 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.

IN CLASS RECORDING:

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include student presentations, academic exercises involving solely student participation, assessments (quizzes, tests, exams), private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

DISCLAIMER:

This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.