

# ATM 317: Dynamic Meteorology II

Spring 2021

**Professor:** **Andrea Lopez Lang**  
alang@albany.edu  
Office Hours: 10-11 am Monday & Wednesday  
via Zoom (or by appointment)

**Teaching Assistant:** Fangze Zhu  
fzhu@albany.edu  
Office Hours: 1-2 pm Tuesday & Thursday  
via Zoom (or by appointment)

**Location:** BB 141 & Online via Blackboard (BB)      **Course Number:** 1122 & 10291  
**Time:** Friday 9:30am – 10:25am      **Credits:** 3  
& asynchronous online in BB      **Prerequisite:** ATM 316

## **Course Description:**

An application of the governing equations to describe and understand synoptic to planetary scale phenomena, including vertical motion, jet streaks, and the frontal cyclone; introduction to the concepts of vorticity and potential vorticity.

## **Grading:** A-E

Homework and Assignments (~12): 45%  
Quizzes (9 of 11): 30%  
Mini projects (2-3): 10%  
Final (*TBD*): 15%

## **Texts:**

*Mid-latitude Atmospheric Dynamics* by J. E. Martin (Required)  
*An Introduction to Dynamic Meteorology* by J. R. Holton (Recommended)

## **Zoom Link:**

The link for all the remote portions of the course will be posted in the course Blackboard page and is copied below.

Topic: ATM 317 (Office Hours & Class)  
Zoom Link: <https://albany.zoom.us/j/92229999488?pwd=UzJ5THlWSzd6Uig5ajZNbHJoWjhNUTog>  
Meeting ID: 922 2999 9488  
Passcode: 2021ATM317

**Successful completion of the Spring 2021 version of ATM 317 course requires:**

- Reliable internet access
- An environment conducive to watching and focusing on video content
- Engaging in course content weekly via videos and Friday discussion/activities
- A device with a camera for documenting assignments and other activities

**Course Topics (Tentative):**

1. Review (Kinematic properties of flows, balanced flows)
2. Thermal Wind
3. Circulation
4. Vorticity / Potential vorticity
5. Waves in the atmosphere / wave equations
6. Quasi-geostrophic approximations
7. Quasi-geostrophic omega equation
8. The **Q**-vector \*

\* Topic introduced if time allows

**What to expect each week:**

To make things run as smoothly as possible, we will try to maintain a consistent weekly schedule.

- Every week, the video content will be posted on Saturday afternoon/evening. You must watch the weekly videos before class on Friday.
  - We suggest forming a group or peers for video watching. Use a service like Watch Together (<https://wzg.tv>), to sync the video with your group so that you can discuss questions that arise. Bring those questions to office hours or to class on Fridays to further discussions.
- Class on Friday will start with a short review and discussion of the weekly video content, followed by an activity or assignment.
- These weekly activities and/or assignments will be due before class begins on the following Friday.
- After class, you will have the rest of the day to complete a weekly quiz in Blackboard. These quizzes will consist of up to 5 questions from the topics covered during the week.
- More information on the mini-projects will be given later this semester, but these will generally be review assignments where you creatively explain a course concept to the class.
- We also encourage you to take advantage of office hours!

ATM 317 Weekly Template					
Sat/Sun	Monday	Tuesday	Wednesday	Thursday	Friday
Weekly BB content posted by 10 pm Sat	Watch weekly videos				HW due by 9:30am
**check, even if no BB announcement is made**	Prof. Lang's Office Hours 10-11am (HW focus)	Fangze's Office Hours 1-2pm	Prof. Lang's Office Hours 10-11am (Video focus)	Fangze's Office Hours 1-2pm	Class @ 9:30am BusBld 141 Quiz due by 10pm

### Missed Classes/late work:

Spring 2021 is not going to be a 'normal' semester. We all have extra COVID-related stressors in our lives right now. There might come a time this semester where you need a day or two.

- For everyone, I give 3 free no-questions-asked late days to be used at any point in the semester. You must let us know how many of your days you are using on the due date of the assignment. If you think you'll need more than 3 days, talk to us prior to the 3<sup>rd</sup> day and we can work something out.
- If an assignment is turned in late, without any prior communication, a late penalty of 5% per day will be given to the assignment grade.
- If your distress is interfering with your relationships, academic, work or daily life, confidential support is available to you. Take advantage of it. Contact Counseling and Psychological Services (CAPS) at 518-442-5800 or [consultation@albany.edu](mailto:consultation@albany.edu) to schedule a virtual appointment. The CAPS website also contains self-help resources and other valuable information: [https://www.albany.edu/counseling\\_center/](https://www.albany.edu/counseling_center/)

If you haven't already, I recommend that you familiarize yourself with the University's rules for keeping us all safe during the pandemic: <https://www.albany.edu/covid-19>

### Accessibility:

If you have a documented disability and may require some accommodation or modification in procedures, class activity, instruction, etc., please see me early in the semester. If you need forms or information, please visit the Disability Resource Center;

→ <http://www.albany.edu/disability/index.shtml> ←

### Academic Integrity:

It is every student's responsibility to become familiar with the standards of academic integrity at the University. Claims of ignorance, of unintentional error, or of academic or personal pressures are not sufficient reasons for violations of academic integrity. Please see the current Undergraduate Bulletin or University Libraries for more information on academic integrity.

→ [http://www.albany.edu/undergraduate\\_bulletin/regulations.html](http://www.albany.edu/undergraduate_bulletin/regulations.html) ←

## Tentative Spring 2021 ATM 317 Schedule

<b>Week</b>	<b>Dates</b>	<b>ATM 317 Topics</b>
1	<b>Feb 1–5</b>	Welcome! Review: kinematic flows & eq of motion
2	<b>Feb 8–12</b>	Review: Using assumptions w/ Eq of motion, thickness & thermal wind
3	<b>Feb 15–19</b>	Kelvin's & Bjerknes Circulation Theorems, circulation vs vorticity
4	<b>Feb 22–26</b>	Vorticity in natural coordinates & vorticity equation
5	<b>Mar 1–5</b>	Vorticity eq's terms, Potential Vorticity (PV) and its conservation/non-conservation
6	<b>Mar 8–12</b>	Waves in the atmosphere, properties of waves, dispersion relationships
7	<b>Mar 15–19</b>	Wave eqs: gravity waves, inertia-gravity waves, Rossby waves
8	<b>Mar 22–26</b>	Waves in the Extratropics, wave vs mean flow
9	<b>Mar 29–Apr 2</b>	Quasigeostrophic assumptions and equations
10	<b>Apr 5–9</b>	The quasigeostrophic omega equation
11	<b>Apr 12–16</b>	Trenberth form of the Omega eq, and the deformation terms
12	<b>Apr 19–23</b>	Geostrophic paradox and the role of QG omega
13	<b>Apr 26–30</b>	The Q vector and it's application
14	<b>May 3–7</b>	Bringing it all together, review activity
Finals	<b>May 12–15</b>	Date and time are TBA