

ATM 316 - Dynamic Meteorology I

Fall 2022 Class # 5096

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Instructor: Prof. Robert Fovell

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Zoom: <https://albany.zoom.us/my/rfovell> (by prior arrangement)

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Office hours: Whenever I am in my office, or by appointment

Course page: <http://www.atmos.albany.edu/facstaff/rfovell/ATM316/>

TA: Megan Schiede (mschiede@albany.edu), office hours Tues and Thurs 12-1 or by appointment

Credit: 3 hours

Prerequisites: ATM 211, PHY 150 or 151, MAT 214 (enforced); MAT 311 (corequisite)

Class meetings: MWF 9:30-10:25 AM in 480 ETEC between 8/22 and 12/05

Final exam: Tuesday, December 13, 10:30 AM to 12:30 PM

Required text: *Mid-latitude Atmospheric Dynamics: A First Course*, by J. Martin.

Objectives: Dynamic meteorology is where we start applying mathematical tools and physical principles to understand how and why the atmosphere behaves as it does. In Dynamics I, we identify the fundamental forces (real and apparent) and derive the basic equations for momentum, continuity, and hydrostatic balance, to better understand synoptic-scale flows.

Grading (A-E): Homeworks (7-8 assignments): 30%; Quizzes: 10%; Midterm exams (*tentatively*, 10/7 and 11/9): 30%; Final exam: 30%.

General topic list:

- Review of vector calculus.
- Fundamental forces.
- Rotating frame of reference and apparent forces.
- Hydrostatic balance.
- Momentum equation.
- Continuity equation.
- Scale analysis of the equations of motion.
- Pressure and natural coordinates.
- The “thermal wind”.
- Balanced flows and the Rossby number.

Blackboard: Will be used primarily to host the class lecture Zoom links and past recordings, although that is subject to change. Copies of handouts and assignments will always be available on the course page.

Late policy: Late homework and off-time exams are only allowed for University-recognized reasons.

Absences: Class attendance is expected. Unavoidable, anticipated absences – including absences for religious observances – should be discussed with the instructor in advance, and arrangements should be made to make up missing work. For information on medically necessary absences, refer to http://www.albany.edu/health_center/medicalexexcuse.shtml. Information regarding absences due to religious observance may be found here: <https://www.nysenate.gov/legislation/laws/EDN/224-A>.

Academic integrity: Students are responsible for doing their own work, and also responsible for being familiar, and complying, with the University's academic integrity standards. Refer to http://www.albany.edu/undergraduate_bulletin/regulations.html for more information.

COVID-19 information: At the University at Albany, supporting the health and safety of all members of our campus community is a top priority. During the COVID-19 pandemic, we are following federal, state, and local public health guidelines, and these guidelines apply to all campus community members across all University spaces. To ensure that each of us has a healthy and safe learning experience within courses that involve in-person contact, all students, faculty members, staff, and visitors are required to adhere to the expectations outlined on the University's COVID-19 website: <https://www.albany.edu/covid-19/planning-fall-2020/health-safety>.

Psychological health: If your distress is interfering with your relationships, academic, work, or daily life, confidential support is available to you. Contact Counseling and Psychological Services (CAPS) at 518-442-5800 or consultation@albany.edu to schedule an appointment with a psychologist. Virtual counseling services are available. The CAPS website (www.albany.edu/caps/) also contains self-help resources and other valuable information.