

About METR 3113

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Who, When, What

The instructor is Prof. Brian Fiedler, ✉ bfiedler@ou.edu Office is at NWC 5636.

METR 3113 *Atmospheric Dynamics I* meets MWF 10am NWC 1350

Goal Statement

The goal of METR 3113 is to develop the student's abilities in using knowledge of the fundamental forces in the atmosphere: the pressure gradient force, gravity and the Coriolis force. Analysis of atmospheric motion caused by these forces is done without recourse to the analysis of continuous vector fields. This means vector calculus is minimally employed. Aspects of fluid mechanics, for example changes in the pressure field resulting from "colliding parcels", is reserved for later courses.

Course Content

1. Units of measurement.
2. Dimensions, dimensional homogeneity and dimensional analysis.

3. Vectors and orientational invariance. Vector products.
4. Elementary functions and elementary differential equations.
5. Review of elementary Newtonian mechanics.
6. The equation of motion in one-dimension as a differential equation, and its solution. Conservation of energy.
7. Pressure. The pressure gradient force. Bernoulli equation.
8. The buoyancy force. Buoyancy driven motion.
9. Choosing a coordinate system.
10. Polar coordinates.
11. Non-inertial reference frames. Tidal forces. Rotating reference frames, the Coriolis force.
12. The gradient wind.
13. Angular momentum in the presence of a Coriolis force. Vorticity.
14. The thermal wind.

Textbook and Video Lectures

The textbook is provided as a free PDF file, available for download at TextBook.

Video lectures are available for download <http://gentry.metr.ou.edu/metrlect>.

Grading

The grade for the course is usually determined by a weighted average of JiTT scores, Test scores, Writing Assignments, and Final Exam, The total score for the course is a weighted average of these scores:

- 60%: 3 test scores, with the JiTT score replacing the lowest test score, if it is greater.
- 30%: Final Exam
- 10%: Writing Assignments **AND/OR** Dynamics Carols **AND/OR** Classroom Presentations.

Alternatively, the total score is based 100% on the Final Exam, if that total score is higher than the above method. (Only very rarely is that so).

No calculators are allowed in tests or exams.

The final letter grade is computed from the total score t with:

- A: $t \geq 80$.
- B: $65 \leq t < 80$.
- C: $50 \leq t < 65$.
- D: $35 \leq t < 50$.
- F: $t < 35$.

JiTT

JiTT stands for Just-in-Time Teaching, which you can read about [What is JiTT](#). But JiTT also means something simpler --JiTTs are the online questions that must be answered by 8am on the day of a lecture. In general, two new questions are posted by noon after a lecture, which generally gives students at least 44 hours to read and answer the two new questions.

Students may answer JiTT questions and check their grades at the [secure student record page](#) Students will need both the *class password* to view the page, and their *personal METR 3113 password* to interact with it. (Also, more details about the grading policy can be viewed in the above link). These passwords were distributed on August 18. Your personal METR 3113 password is NOT your OU password.

This will expand as the semester progresses: [2010 Graded JiTT questions](#).

Similar JiTT summaries are available for previous years at <http://12characters.net/old3113/>. Those summaries should be helpful to you as you attempt to answer this year's questions.

Students are NOT required to work alone on the JiTT problems. It is not realistic to enforce that; only the honest people would suffer. So share the joy of your scientific and analytic inquiry with your peers!

Important Dates for Graded Items

- Monday 9/27: Test #1
- Friday 10/15: OU-Texas holiday, no class (?)
- Monday 10/25: Test #2

- Monday 11/22: Test #3
- First draft of the Writing Assignment is due by 11:59 pm Monday November 29.
- Final draft of the Writing Assignment is due by 11:59 pm Monday December 6.
- Wednesday 12/15: Final Exam, 8am-10am. Confirm with [official schedule](#)
- due dates for the writing assignments will be announced during the semester

Office Hours

Office hours will be 9:30am to 10:00am MWF in our lecture room NWC 1350. Or you may just drop by my office, NWC 5636. Or you may e-mail me to schedule an appointment. Other office hours are online, the night before class: Sunday, Tuesday and Thursday at 10:00 pm. The subject of the online office hours is usually the JiTT questions, the answers to which are due by 8:00 AM the following morning. The "office hours" are in the chat room available for this course at [learn.ou.edu](#) (use the password given to you by OU).

Passwords

On August 18, 2010. This password email was sent to all enrolled students.

Required Disability Statement

What statement is the most common statement on OU syllabi, and that a typical OU student may see 40 times before graduating?

1. "The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone 405/325-3852 or fax only 405/325-4173."
2. "If I have seen further, it is by standing on the shoulders of giants." - Isaac Newton

3. "Everything should be made as simple as possible, but not simpler." - Albert Einstein

Answer: 1.