

1. **Instructor:** Dr. Brian Fiedler, 325-2860, bfiedler@ou.edu, NWC 5636
2. **Web site:** This paper copy has only some of the information that is available at the official website, <http://mensch.org/3113>, which you should visit for the latest information.
3. **Time and Place:** Monday, Wednesday and Friday 10:00-10:50 in NWC 1350.
4. **Textbook:** None! Lecture notes will be distributed. But at the end of the semester, we closely follow the chapter on basic mechanics of fluids, which exists in the standard physics textbooks of either Giancoli or Tipler. (i.e, the textbooks used at OU in recent years).
5. **Grading Policy:** For details, see the class web page.
  - 60%: 3 quiz scores, with the JiTT score replacing the lowest quiz score, if it is greater.
  - 35% Final exam
  - 5% Extra Points: (Presenting JiTT Solutions, Stand and Deliver, Dynamics Carols)
6. **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.
7. **Course Content**
  - (a) Units, dimensional homogeneity and dimensional analysis.
  - (b) Vectors and rotational invariance. Vector products.
  - (c) Elementary functions and elementary differential equations.
  - (d) Newton's law of gravity.
  - (e) Newton's laws of motion.
  - (f) The equation of motion in one-dimension and its solution. Conservation of energy.
  - (g) Pressure. The pressure gradient force. The buoyancy force.
  - (h) The vector equation of motion. Coordinate systems, Cartesian and polar.
  - (i) Centripetal acceleration. Conservation of angular momentum. Cyclostrophic wind balance. Tornadoes.
  - (j) Inertial forces in accelerating reference frames.
  - (k) An equation of motion for meteorology. The Coriolis force.
  - (l) The tidal force.
  - (m) The gradient wind.
  - (n) Conservation of angular momentum with the Coriolis force.
  - (o) The thermal wind.
  - (p) An introduction to continuum mechanics. Simple forms of the continuity equation. More about pressure and buoyancy. Bernoulli equation.

8. **Dates for Quizzes and Exams**

- Quizzes: Monday 9/24, 10/22, 11/19
- Final exam is on Tuesday, December 11, 8:00 AM - 10:00 AM

9. **Required words about disabilities:** "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 TDD only 405/325-4173."