

ATMO 456
Advanced Weather Forecasting
Spring 2008

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Office hours: Wednesday 10:00-11:30, anytime I'm around, or by appointment

Teaching assistant: Meng Zhang

Prerequisite: ATMO 251

Credits/contact: (1-4) Credit 3.

Course Schedule:

Lecture Friday 1:50-2:40 Scoates Hall Room 215

Laboratory Monday&Wednesday, 1:50-3:50 O&M Room 1201

Required Textbook: Weather Forecasting Handbook, by Tim Vasquez

Friday In-class Quizzes: 15% of grade, based on textbook, consisting of four questions (at least two drawn from "review questions" at end of chapters)

Jan. 18: Chapter 1 – Fundamentals

Jan. 25: Chapter 12 – Numerical Guidance

Feb. 1: Chapter 10 – Winter Forecasting

Feb. 8: Chapter 2 -- Observation

Feb. 15: Chapter 3, section 1 – Chart Analysis

Feb. 22: Chapter 3, sections 2-6 – Other Tools

Feb. 29: Chapter 4 – Physics

Mar. 7: Chapter 5 – Fronts and Jets

Mar. 14: Spring Break

Mar. 21: Reading day, no classes

Mar. 28: Chapter 6, sections 1-6 – Motion, part 1*

Apr. 4: Chapter 6, sections 7-10 – Motion, part 2

Apr. 11: Chapters 7 and 8 – Barotropic and Baroclinic Systems

Apr. 18: Chapter 9 – Convective Weather

Apr. 25: Chapter 11 – Tropical Weather

Apr. 29: Redefined Friday: Class, but no quiz

*The Mar. 28 quiz will consist of four original questions and no "review questions".

Learning Modules: 25% of grade. UCAR/COMET Meteorology Education and Training (METED) learning modules may be accessed from <<http://www.meted.ucar.edu>>, using the subject headings under "topics". Each student is responsible for five modules.

During the course of the semester, each student will write five forecast exercise papers (2 pages plus figures) demonstrating proficiency with the modules by briefly summarizing a particular module and then applying it to a particular real-time forecast problem, and five verification papers (1 page plus figures) assessing the accuracy of that forecast and diagnosing any errors.

The modules and exercise papers may be done in any order, except that it of course makes sense to read a module prior to applying it. The exercise papers must be submitted via email in Word, RTF, plaintext, or HTML format prior to the forecast event actually taking place, and the corresponding verification paper must be completed and submitted no more than 48 hours after the forecast verifies. Clearly identify the COMET module at the beginning of each forecast paper.

You can choose any module to be the focus of the forecast and verification; it would be wise to monitor the weather situation and pick modules that are particularly appropriate. Do not choose modules that focus on data that you cannot readily access or on outmoded data or models. Click the "Description" link below the title of each module for a brief description, including an estimate of the time required. **Combined, your modules must state that they require at least 6 hours.** If the five modules you really want to do don't take that long, you are free to write up additional modules until you attain the 6-hour minimum.

By not waiting until the due date, you can pick especially interesting situations. If you have preferred modules, keep an eye on the weather situation for a good time to make a forecast. The first exercise paper must be submitted by January 28, with successive deadlines every two weeks, not counting Spring Break (Feb 11, Feb 25, Mar 17, Mar 31, Apr 14).

Grades on the forecast papers will be based on clarity, spelling/grammar, understanding of the module, and appropriate reasoning in the forecast. Grades on the verification papers will be based on the accuracy of the forecast, demonstration of understanding of errors and how to correct them, and organization.

Laboratory Notebooks and Presentations: 30% of grade. Laboratory sessions will typically involve team forecasting projects, with possibly one team designated to give a presentation at the end of the lab. Teams will be chosen randomly and be rearranged once every fortnight.

Laboratory Outline:

Jan. 14-Jan. 16: Forecasting lab resource development

Jan. 21-Jan. 30: Ensemble Prediction

Feb. 4-Feb. 13: Snow Forecasting

Feb. 18-Feb. 27: Potential Vorticity

Mar. 3-Mar. 26: Full Frontal Anatomy

Mar. 31-Apr. 9: Long-Range Forecasting

Apr. 14-Apr. 23: Minimum Temperatures

Apr. 28: Wild Card

Each student will keep a laboratory notebook consisting of forecasting notes, forecasts, analyses, and other in-class lab assignments. In your notebook, record your forecasting process, reasoning, and other information **as you conduct the project.** This is not the place for polished prose and analysis, but instead it should reflect your learning process, with all the messiness and false starts inherent in such a process. Notebooks will be collected on randomly-selected days six times during the semester, and the laboratory notes for that day will be evaluated for evidence of engagement, understanding and accomplishment.

Team presentations, when given, will be evaluated on the basis of clarity, understandability, and correctness.

Forecasting Project: 15% of grade. Each student will conduct a forecasting project, consisting of making and providing a forecast of value to a private company, and present to the class the background, the forecast, the verification, and its value. The private company will be of the student's own choosing. *The forecasting project presentations will be made the week after Spring Break.*

Business Paper: 15% of grade. Each student will create a business model for a weather forecasting company. The ten-page paper will describe the proposed business model: the customer base, the competition, the pricing model, the growth plan, the advertising plan, and the startup costs. *The initial draft of the paper is due April 8, and the final draft is due April 26.*

Final Grade: With the exception of the quizzes, all grades in the course will be letter grades; grades will be averaged in the proportions given above to determine the final grade for the course. Quiz scores will be added together and converted to letter grades on the basis of 90-100% = A, 80-90% = B, etc.

Aggie Code of Honor: An Aggie does not lie, cheat, or steal, or tolerate those who do. Incidents of academic dishonesty, including plagiarism, will be dealt with according to established procedures. See <http://www.tamu.edu/aggiehonor/> for more information.

Absences will be handled in accordance with Student Rules (<http://student-rules.tamu.edu/rule7.htm>).

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