

ATMS 350

Weather Forecasting

Spring 2008

Professor : Dr. Chris Hennon
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Office Hours : MW 10:30-11:30, TR 9:00 – 10:00 am and other hours by appointment

Course Description

The atmosphere is wonderfully chaotic, yet increasingly more predictable. Our better understanding of atmospheric physics and the ability to include this understanding into modern numerical weather prediction models has allowed for more accurate forecasts, and for longer forecast lead times.

This course will provide you with a basic understanding of modern atmospheric prediction. Topics include forecasting agencies, forecast tools, numerical weather prediction models, model output statistics, ensemble forecasting, and many hands-on case studies for you to put into practice what is learned. Forecasts will be made that focus on temperature, wintertime precipitation, turbulence, fog, tropical cyclones, severe weather, and daily weather.

Class Information

Call Number : 10450
Days and Time : M W F 2:45 pm – 3:35 pm
Building / Room : RBH 238 (Robinson Hall)

Textbook : Weather Forecasting (Brotak, 2007)
Available for purchase.

Website : <http://facstaff.unca.edu/chenon/classes/atms350.html>
Prerequisites : ATMS 205

Grading Information

In this class, your grade will be determined by a contract that you sign during the first week of class. This puts you in control of how you are evaluated in the course.

You have the option to determine the weights that each component of your grade contributes to the total grade (within certain specified boundaries). All components are mandatory. As long as your choices add up to 100% and you satisfy the minimum requirements specified, you have a valid grading contract.

Renegotiation

I understand that it may be difficult at the beginning of the semester to determine the best contract for you – it's the beginning of a new course, you don't know the material or the nature of the assignments, etc. Therefore, I will allow any of you to renegotiate your contract during week 7 (Feb. 25) of the class, after the first exam. This will establish a new contract for the remainder of the semester. However, there are some guidelines that must be followed for renegotiation:

- 1) You must initiate the renegotiation process. I will not specifically ask for them.
- 2) You cannot *increase* the weight of an assignment already graded. For example, if you initially designated Exam I as 5% of your grade but you received 99/100 points, you will not be able to raise the weight of Exam I to 20%.
- 3) You can *decrease* the weight of completed assignments, but by no more than 50% of the initial contract. In addition, you cannot decrease the weight below the minimum requirements set forth below. For example, if you initially designated Exam I as counting 20% toward your grade but you received a 44/100, you can decrease Exam I to 10% of your grade (but not 5% since that is more than 50% below your original weight, and not 0% since that falls below the course minimum requirement).
- 4) All revised weights must still add up to 100%.

Contract Components

The table below summarizes the “menu” that will be put together to form your contract. Here is how to interpret each of the columns:

Name of component: Titles of the various components that can be used to determine your final grade.

Possible: The maximum amount of each component that will be available throughout the semester.

Minimum Number Required: The minimum number of that component that you are required to complete.

Minimum Total % (Each): The minimum weight that you can apply toward that component.

Maximum Total % (Each): The maximum weight that you can apply toward that component.

Number you will attempt: The number of components that you will complete in the semester.

Percent of your grade: The weight that you choose to assign that component. Must be between the minimum total % and the maximum total %.

Total % of your grade: Multiply columns F and G.

The totals in column H must add up to 100%. If they do not add up to 100%, you must make adjustments in your contract choices. If you have any questions about this process, please do not hesitate to talk to me about it.

You are still encouraged to complete and turn in all of the work, even if you are not contracted to do so. Along with the obvious advantages gained of learning the material, you will also be able to drop your low(est) score(s) from the excess assignments turned in. For example, if you contracted for 8 homework assignments and turned in 10, your lowest two scores will be dropped.

Brief Summary of Contract Components

Mid-term Exams: These exams will evaluate your knowledge on material presented in each 5-week section. There are two mid-term exams. They are not cumulative.

Final Exam: Similar in format to the mid-term exam but designed to test your knowledge of material learned over the entire semester. Generally longer than a mid-term exam, containing questions on new material as well as larger concepts learned throughout the class.

| A | B | C | D | E | F | G | H |
|-------------------|------------|-------------------------|------------------------|------------------------|-------------------------|------------------------------|-------------------------------|
| Name of Component | # Possible | Minimum Number Required | Minimum Total % (Each) | Maximum Total % (Each) | Number you will attempt | Percent of your grade (Each) | Total % of your grade (F * G) |
| Mid-term Exam I | 1 | 1 | 5% | 15% | 1 | | |
| Mid-term Exam II | 1 | 1 | 5% | 15% | 1 | | |

| | | | | | | | |
|----------------------|----|---|-----|-----|---|--|--|
| Final Exam | 1 | 1 | 10% | 25% | 1 | | |
| Forecast Competition | 1 | 1 | 5% | 15% | 1 | | |
| Lab Exercises | 10 | 8 | 3% | 6% | | | |
| Weather Briefing | 2 | 1 | 5% | 10% | | | |
| Total (must be 100%) | | | | | | | |

Forecast Competition: Your scores in the 'WxChallenge' forecast competition will be tracked and incorporated into your class grade. Trends in forecast performance will be considered.

Lab Exercises: Approximately 10 lab exercises will be performed throughout the semester. They will generally be handed out on Monday and due that Friday.

Weather Briefing: A class presentation about the current and future weather. The presentations will be about 10 minutes and should demonstrate understanding of weather and weather processes. Each student will perform at least one briefing.

Grading Scale

Your final grade will be based on the following scale:

| | |
|------------|----|
| 92 – 100% | A |
| 90 – 91.9% | A- |
| 88 – 89.9% | B+ |
| 82 – 87.9% | B |
| 80 – 81.9% | B- |
| 78 – 79.9% | C+ |
| 72 – 77.9% | C |
| 70 – 71.9% | C- |
| 68 – 69.9% | D+ |
| 60 – 67.9% | D |
| < 60% | F |

Make Up Policy

Homework Assignments: Lab assignments are due at the beginning of class on the due date. Assignments may be turned in up to 24 hours late for a 50% penalty. *Homework more than 24 hours late will not be accepted under any circumstances.* If you put homework in my mailbox, please find another faculty member to date/time stamp it. My mailbox is outside of my office in room 236 RBH.

Exams: Make up exams will be given only in cases of extraordinary circumstances. You must provide written documentation. I will evaluate each reason on a case by case basis. Make up exams may include an oral section.

Academic Dishonesty

If you use any form of cheating on an exam or assignment, you will be subject to procedures outlined in section 8.3 of the UNCA Faculty Handbook. Possible outcomes include receiving a zero for the exam or assignment, dismissal from the course, and/or suspension/dismissal from the university.

Class Schedule

| <u>Week</u> | <u>Topic</u> |
|------------------------|---|
| Week 1 – Jan 14-18 | – Introduction, Scales of Predictability |
| Week 2 – Jan 21-25 | – Forecast Organizations/Structure/Jobs |
| Week 3 – Jan 28-Feb 1 | – NWP History/Types of Models |
| Week 4 – Feb 4-8 | – Current NWP Models/ MOS/ FOUS |
| Week 5 – Feb 11-15 | – Forecast Products / EXAM I (Feb. 13) |
| Week 6 – Feb 18-22 | – N-AWIPS / Temperature Forecasting |
| Week 7 – Feb 25-29 | – Forecasting Mid-latitude cyclone development |
| Week 8 – Mar 3-7 | -- NO CLASS – SPRING BREAK |
| Week 9 – Mar 10-14 | – Forecasting Snow / Precipitation Type |
| Week 10 – Mar 17-21 | – Ensemble Forecasting / EXAM II (Mar. 21) |
| Week 11 – Mar 24-28 | – Ensemble Forecasting |
| Week 12 – Mar 31-Apr 4 | – Forecasting Turbulence / Fog |
| Week 13 – Apr 7-11 | – Forecasting Tropical Cyclones |
| Week 14 – Apr 14-18 | – Forecasting Severe Thunderstorms |
| Week 15 – Apr 21-25 | – Forecasting Tornadoes |
| Week 16 – Apr 28 | -- Wrap up |

Final Exam: Friday, May 2, 3:00 – 5:30 pm, RBH 238