

# MET 595 Special Topics: Meteorology for Educators

## Syllabus

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Text: A world of Weather: Fundamentals of Meteorology, Third Edition  
By Lee M. Grenci and Jon M. Nese  
Kendall/Hunt Publishing Co., 2001 (ISBN: 0-7872-7716-9)

### Overview:

This course is designed for those who have a background in some form of science and uses many exercises that can be adapted in the middle-school or high-school science programs. The goal is an understanding of the atmosphere and to be able to make basic forecasts of the weather using information available through the internet. Math is limited to algebra for this course as more time is spent with hands-on exercises than in developing theories and equations. Text material will be supplemented with slides and external resources.

### Course outline:

- Basics
  - Administration
    - Getting around Blackboard and personal updates
- Background
  - Introduction to weather analysis (Chapter 1)
    - Basic measurements, weather data plots, and isopleths
  - Solar radiation and temperature (Chapters 2 & 3)
    - Radiation spectrum, atmospheric absorption, temperature, satellite images
  - Pressure and wind (Chapters 4 & 5)
    - Surface pressure and wind charts, upper air charts
  - Water in and out of the atmosphere (Chapters 6 & 7)
    - Water vapor pressure, humidity, stability, clouds, precipitation
- Fun Stuff
  - Thunderstorms (Chapter 8)
    - Lightning thunder, hail, flash floods, microbursts
  - Tropical weather (Chapters 9 & 10)
    - Tropical circulation patterns, El Niño, hurricanes
  - Mid-latitude cyclones and fronts (Chapters 11 & 12)
    - Vertical motion, low pressure features, fronts
  - Severe weather (Chapters 13 & 14)
    - Severe thunderstorms, tornadoes, waterspouts
- Forecasting
  - Numerical models (Chapter 15)
    - Features of models and basic interpretation techniques
  - Operational Forecasts (Chapter 16)
    - Putting it all together!

Grading:

Participation in on-line discussion groups .....	10%
Exercises/Labs .....	25%
Exams.....	40%
Course forecasting project .....	25%

Discussion groups:

Each overall section (Basics, Fun stuff, Forecasting) will have at least one discussion thread set up on Blackboard based on the material in that section. Contributions to these discussions are required. Feedback on the labs, exercises, and course material is also welcomed.

Exercise/Labs:

Projects will be given to help you practice what you are learning and to put the text material into perspective. Many of these exercises can be used in a middle-school and secondary school setting (with some modification) so the students can become the teachers of this material. These exercises and labs will cover each of the subtopics listed above (usually one or two chapters from the book).

Exams:

We can't escape the exams. There will be an exam on the Basics, Fun stuff, and Forecasting sections. No comprehensive exam will be given in this course! The exams will all be on-line and you will have 2 hours to finish from the time you begin. Plan accordingly with your on-line time so that you have continuous, uninterrupted access during the exams. Should something happen and your connection is lost, your computer hangs, a meteorite knocks out the communication lines, or other such catastrophe, let me know via email or phone and I will look into resetting the exam time for you. Each exam is open book, but please be on the honor system by doing your own work throughout the class.

Course forecasting project:

Various locations will be selected during the course of the exam with the site changing each week. You will be required to forecast the weather for the site that week on at least 3 days from Monday through Friday. Your forecast will consist of the high and low temperatures and the precipitation category (amount) from midnight through midnight of the following day. Each forecast must be entered on Blackboard no later than 5 pm Mountain Time. Verification information will be posted on Blackboard by 9 am Mountain Time the day after the forecast period ends. Each Monday you will be required to write a summary of what you think went right or wrong in your forecasts during the past week. Participation and the quality of the summary will determine the grade for the forecasting project.

Don't hesitate to ask for help or to provide help to your classmates. That is the purpose of the discussion threads and it will help all of us to learn more. It is often difficult to learn when the only voice you hear is your own, so please chime into the discussions and participate. If you are not comfortable asking your question in the discussions or have a problem that you feel is inappropriate for the rest of the class to hear, please contact me directly. Email works best, but you can phone me if you prefer.