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Course: **CollegeNow Meteorology 2008**
EPS 31 Sec: CLG1N Code: 2292

Meetings: Tuesday and Thursday 750-905 am

Text: *The Atmosphere*, Lutgens & Tarbuck, 10th Ed.

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This course will address the fundamental issues and processes within meteorology and climatology. **Participants in this course will gain expertise in the course subject matter** and a familiarity with the current state of research on the subject. By the end of this course you will know; where to find climate and meteorological data, how to retrieve that data and how to manipulate and analyze data using modern scientific applications. A student who puts in a good and honest effort in this course will also have improved their ability to work with any scientific subject matter, not merely that of climate and meteorology.

In order to ensure proper learning of complex subjects such as this, **it is often necessary to create some checks on your understanding** during the process. A good check on learning ability, contrary to popular opinion perhaps, should indeed involve mastery of the facts at hand and the ability to easily recall and organize them. That is of course just a start. The proposed syllabus included here would be an invaluable start in organizing your learning about this subject. Checks on learning need to be comparable between students, this allows the degree of learning and the quality of learning to be ranked and understood at the end of our course time here. We need to determine what further checks you will require.

| Week | Chapter Readings | |
|---|---|---|
| 1 | 1 | |
| 2 | 2 | |
| 3 | 3 | Exam 1 (1-3) |
| 4 | 4-5 | |
| 5 | 6 | |
| 6 | 7 | Exam 2 (4-7) |
| 7 | 8 | |
| 8 | 9 | |
| 9 | 10-12 | Exam 3 (8-12) |
| 10 | 14-15 | |
| 11 | More on climate | |
| 12 | More on climate & paleoclimate | |
| Final Exam; cumulative | | |

Normally, educators distinguish between a **few basic modes of learning**. In Behaviourism, reward is doled out for favoured behavior, and is thought to reinforce it. Constructivism is sometimes called active learning and involves the learner engaging in activities that allow them to build on their prior knowledge to reach knowledge of the subject matter. There are many other theories about learning and you can feel free to investigate them yourself when considering your performance in this class. All of these theories of learning are being postulated and experimented on in order to facilitate learning, to *make learning easier*.

Along with direct tests, **reading material beyond the textbook** is an excellent way to verify your own learning progress. This could perhaps include essays posted online or published in magazines, primary data reports published in peer reviewed scientific journals and traditional and trustworthy books on particular aspects of our subject. And important distinction should be made between primary and secondary information, along with academic and polemic writing. Neither need be excluded, as it is just as useful to see where another person's reasoning has fallen short as it is to see where their reasoning held together. Indeed, actual, operative science is advanced not by confirmation or verification of a hypothesis, but rather by refutation of one.

The modern student is fortunate, as there is a **great wealth of activities** related to nearly any subject imaginable readily available to them. The performance of an activity would be another efficient way to verify your understanding of our course matter. This is not a laboratory course. That does not mean that we do not have access to a laboratory. Even if that seems too daunting to most of you, there are other activities and experiments that can be performed inside and outside the classroom, in groups or as individuals.

**A mix of reading, writing, and labs**, I believe it is clear to all, would be preferred to several assignments of only one type.

While it is easy to let a deadline slip by unmet**, it is still very important to establish deadlines.** These provide a level of organization to your work in the class. Many students feel that they work best 'when the deadline is near'; however this is almost always found to be false. The usual difference between work done right before a deadline and work done in a sensible amount of time is that the former work is done more intensely. This seems to give students the impression that they are working effectively. Therefore I strongly recommend that if you set deadlines, you make sure to start your work as early as possible. Deadlines are also an equalizer; students who put off work, and then find that they can't perform the work, can use an extension of a deadline in order to finish their task. This is unfair to other students who put the effort into getting their work done on time.

It is also critically important to consider **how much weight** should be given to any one aspect of the course. How much of what a person understands the subject matter is revealed by an excellent score on a multiple choice test, in contrast to a poor performance on a short presentation?

**In short**, assignments and activities should be at least structured well enough so as to be easily understood by all students. Assignments should be varied in type, to ensure that they examine all the different aspects of learning. There should be enough time to allow a person to complete them reasonably well if they put in a good, focused, effort. And finally assignments should be weighted sensibly and thoughtfully, to allow them to properly contribute to a person's overall performance in the course.

Included below is a list of resources that you will find helpful in deciding how you want to do well in this course. We will have some class time to finalize this.

National Climate Data Center
http://www.ncdc.noaa.gov/oa/climate/climateextremes.html
NOAA Office of Weather Publications
http://www.nws.noaa.gov/om/
National Center for Atmospheric Research
http://www.ncar.ucar.edu/
The American Meteorological Society
www.ametsoc.org/AMS/amsedu/
The American Geophysical Union
www.agu.org
The World Meteorological Association
www.wmo.ch/web/etr/

I have a number of other activities that can be handed out and worked on as well. They are short, mostly paper based activities that can be done in a single class period, in they include:

Weather tracking with Doppler radar
Doppler radar in a Vertical Direction
Lightning and Tornados
Wind Chill
Greenhouse Effect
Ozone Depletion and Atmospheric Cooling
Pollution, Wind Speed, Wind Direction
Space Weather Monitoring (sunspots)
Cloud Anatomy
Disappearing Ozone
Forecasting Tornados
El Nino
Analyzing Climate Data
Air Traffic, Weather, and Vectors