Mteor206 – Introduction to Meteorology
Syllabus   Spring 2008

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Text   *The Atmosphere,* F.K. Lutgens and E.J. Tarbuck, Ninth (2003) or Tenth Edition (2007)
The Weather Cycler for interpreting and forecasting your weather. Optional activity kit.
All other course materials are available on the Internet.

Lectures   MWF 2:10-3:00 PM, 125 Kildee

Office Hours   Because this is a computer-based course, I strongly encourage you to use the electronic communication available if you need to contact the TA or me. If you wish to talk to us in person, you can approach us before or after class. Alternatively, my office hours are Tuesdays and Thursdays 2:30 - 3:30 PM or by appointment.

Lecture format   The grading in this class has been weighted to reflect my perceptions of the most important outcomes for you in this course. Although you are expected to read the text, the total course grade is heavily based on activities (72%). You are encouraged to interact with others as you figure out the most appropriate responses but the work that is submitted must be your own. To assist you in preparing for the hour examinations, I will try to have collections of old test questions available for you on WebCT. However, materials on the hour examinations will also be based on class discussions and class assignments.

For my **lectures** I will use traditional lecture presentations and written notes using PowerPoint projected on a screen, slides, and computer simulations. My notes will be posted on WebCT before the lecture.

The details of a **forecast exercise** will be covered in class but some general comments may help reassure you that this is something that each of you can do. You will be able to start with predicting only a few parameters. We will begin this part on Wednesday 16 January 2008. You may try your hand at forecasting current weather using the "regular" forecast exercise from day 1 if you wish. Because we will only count your 25 best forecasts, there is no penalty for trying. Scott will often give you his best judgment concerning many of the answers so if you listen to him during class, you should do very well. You will get 3 points for a correct answer, one point for trying, and no points if you don't participate. There will be 100+ forecast opportunities relating to current weather, one for each day of the semester. I encourage you to submit as many forecasts as possible.

Interactive learning tools that are unique to this course and that involve **computer-based simulation activities** integrate the lectures. These involve responding to questions within **WebCT** (outside of class). In addition, **in-class quizzes and exercises** integrate the simulations. Some of these exercises will be based on the computer-based simulations and some will use the Weather Cycler. **This means you must come to class**. The simulations will involve activities such as making clouds, measuring temperature from a balloon, and forecasting daily weather.

There will be **four one-hour examinations** given but only your best three will be counted. On the other hand, there will be **no make-up exams**.

All assignments are managed and graded by WebCT. Specific assignments will be announced in class and on WebCT's Calendar. Because this part of the course will contribute to 55% of your course grade, **it is essential that you allocate time to regularly use a computer to complete these assignments**. Several days are always allocated for doing assignments, however, because technology is undependable, you are strongly

encouraged to begin your assignments at the earliest opportunity. <u>Late assignments are locked out by WebCT. It is the responsibility of the student to meet assignment deadlines. There are no make-ups</u>.

I am really interested in your **feedback** and I encourage you to letting me know how I can improve the class. I will try to accommodate your wishes as much as possible.

WWW

In order for us to be able to interact with more than 150 students and to provide timely and accurate feedback, I will be using the Internet to communicate with you. The syllabus, schedule of classes and assignments, and the lecture notes will be available through **WebCT**. Extra credit (up to 2%) will be given to students who post questions about the weather, climate, and the atmosphere in the Discussion tool. Up to 5 questions will count towards extra credit.

Many of the course materials are only available from the Internet. To facilitate the management of web-based course material, we will use **WebCT**. Therefore, <u>you must use the WebCT for this class</u>. We will have a help room (3008 Agronomy) staffed by students from 10 AM to 5 PM Monday through Thursday and from 10 AM to 4 PM on Friday to provide assistance on any computer issue related to this course. This room also has several computers that you are welcome to use during any of the open hours. There are many public computer facilities at ISU. These may be located using http://www.public.iastate.edu/~cac_info/openlabs.html

Requirements

In order to pass the course you must:
- Complete at least 25 forecasts of current weather;
- Complete the interactive simulation exercises on WebCT;
- Actively participate in class discussions and
- Attend the lectures.

Unless stated otherwise, **all homework must be submitted electronically**. Makeup exams will not be given since only the best three of four hour-exams will be counted.

You should all be aware of the University's policy on Academic Dishonesty. **I won't tolerate any form of cheating or plagiarism. If caught, you will immediately receive a zero in the assignment/midterm and be reported to the Dean of Students.**

Grading

The forecasting activities, simulation exercises, in-class activities and exams are weighed according to this scheme. Please note that the total is at least 104%, i.e. 4% (or more) is extra credit:

Assignments	Weight
Forecasting (current weather)	25%
Problem sets/Simulation activities, Forecasting (archive weather)	30%
Extra credits	~4%
Total assignments	*59%*
In class	
Quizzes and in-class exercises	17%
Three exams plus final @ 7% each (only final and best 3 of 4 hour exam will be counted)	28%
Total in-class	*45%*

Please note that I will not grade on the curve, so all of you can get an "A". In fact, for the past several years about 2/3 of the students worked hard enough to get B's or better. There is less emphasis on exams and more on showing me (and yourself) that you can "do" meteorology. I have established a grading scale that is largely based on the experience of

professors who have been teaching this class for several years. If I have misjudged, I reserve the right to "ease up" on the grading, but it will not be made more rigorous.

A	$\geq 82\%$	C	$= 61.9\text{-}58\%$
A-	$= 81.9\text{-}78\%$	C-	$= 57.9\text{-}55\%$
B+	$= 77.9\text{-}74\%$	D+	$= 54.9\text{-}52\%$
B	$= 73.9\text{-}70\%$	D	$= 51.9\text{-}49\%$
B-	$= 69.9\text{-}66\%$	D-	$= 48.9\text{-}47\%$
C+	$= 65.9\text{-}62\%$	F	$< 46.9\%$

Attendance

In order to pass this class, you must complete the assignments and come to class. I guarantee that you will get a better grade in this course if you attend all the lectures. I consider the forecasting activities and in-class activities to be most important, and this is reflected in the grading scheme. In case of inclement weather, use your best judgement about attending class. I will be very lenient if weather presents a hazard.

Philosophy

I am very interested in encouraging your active involvement in the class and my focus is on your learning. I want you to learn to think like a meteorologist (and this is not just making wild guesses no matter what comedians say!). You will have the opportunity to do what meteorologists do. This will include collecting and interpreting data and also forecasting. Professors who taught this class before me have done forecasting in class for many years and this has always been the most popular part of the course according to student course evaluation.

Next, I want you to learn to think like scientists. To help accomplish this, you will be given opportunities to learn how to solve problems. The problems we will use are realistic and you will find out that they may have more than one right answer. This approach is intended to serve you in many life situations.

Finally, I want you to gain a better understanding of our physical world. I will try to create circumstances where you will seek understanding because you are curious rather than because an exam is imminent. In this course, the importance of learning to learn and solving problems is reflected by being 72% of the course grade (everything but the actual exams).

This course in introductory meteorology is intended to meet the needs of students whose goal is to satisfy a science requirement. You will have many opportunities to test your understanding of meteorology principles. Because learning from mistakes is an important part of the learning process, you will be given numerous opportunities to try and fail without penalty.

Other information If you have a disability and require accommodations, please contact me early in the semester so that your learning needs may be appropriately met. You will need to provide documentation of your disability to the Disability Resources (DR) office, located on the main floor of the Student Services Building, Room 1076, 515-294-6624.

Meteorology 206 - Spring 2008

(This is a tentative schedule. I will vary the time spent on the various topics based on your interest and participation. We will spend more time on what you will find most interesting or challenging.
Please note that assignments are <u>always</u> due by 12:00 - noon)

Date	Class Period – Reading assignment from textbook	Forecast assignments	Assignments (problem sets, simulations)	Assignment due dates
Jan 14	Course overview Weather in the news Expectations Computer, WebCT	Regular forecast exercise (you may always do a "regular" or current weather forecast when "archived" ones are not due)	ClassNet registration WebCT introduction Problem Set #1 (graphing)	Problem set #1 (graphing) due by 11:59 AM (**noon**) on January 18
Jan 16	Forecasting hints Review ClassNet, WebCT Weather intuition	Current weather forecast	Problem set #2 (map symbols)	Problem Set #2 (Stn_Model) due by 11:59 AM on Jan 25
Jan 18 (Graphing due)	Chapter 1 - Our atmosphere Simple ideas, gases, pressure Discuss graphs Demonstrate Radiation Sim	Current weather forecast	1st simulation (RadiationSim - be prepared for a 1/2 sheet exercise)	RadiationSim (RadSim_pt1 and RadSim_pt2) due by 11:59 AM on Jan 23
Jan 21	*University Holiday*			
Jan 23 (RadSim_pt1 and RadSim_pt2 due)	Chapter 3 - Energy - Part I (Temperature, heat and energy)	Temperature forecasts (must do at least two of four days: archive forecast #1)		ArchiveFCST_1/1 (due by 11:59AM - - Jan 24) ArchiveFCST_1/2 (due by 11:59AM Jan 25) ArchiveFCST_1/3 (due by 11:59AM Jan 26) ArchiveFCST_1/4 (due by 11:59AM Jan 27)
Jan 25 (Stn_Model due)	Chapter 2 - Radiation Discuss 1st simulation (RadiationSim) Start radiation Discussion	Archive forecast #1 con't	2nd simulation (BudgetSim)	BudgetSim due by 11:59AM on Feb 1
Jan 28	Radiation continued Clouds	Archive forecast #2 (must do at least two of 6 days)		ArchiveFCST_2/1 (due by 11:59AM Jan 29) ArchiveFCST_2/2 (due by 11:59AM Jan 30)

				ArchiveFCST_2/3 (due by 11:59AM Jan 31) ArchiveFCST_2/4 (due by 11:59AM Feb 1) ArchiveFCST_2/5 (due by 11:59AM Feb 2) ArchiveFCST_2/6 (due by 11:59AM Feb 3)
Jan 30	Temperature - Part 1 Solar constant Methods of forecasting for 12Z and 18Z temperatures (forecasting hints)	Archive forecasts #2 con't		
Feb 1 BudgetSim due	Temperature changes and measurements Daily variations Discuss 2nd simulation (BudgetSim) Methods of determining moisture (forecasting hints)	Archive forecasts #2 con't	3rd simulation (AdvectionSim)	AdvectionSim due by 11:59AM on Feb 11
Feb 4	Temperature changes and measurements Spatial factors, indices Methods of determining wind speed and direction (forecasting hints)	Current weather forecast	Problem set #3 (Contouring)	Contouring due by 11:59 AM Feb 18
Feb 6	Optics, Part 1 (Ch. 16) Discuss 3rd simulation (AdvectionSim) URL on optics (http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/opt/home.rxml) Methods of determining the movement of fronts	Archive temperature forecast #3 (must do two of five days)		ArchiveFCST_3/1 (due by 11:59AM Feb 8) ArchiveFCST_3/2 (due by 11:59AM Feb 9) ArchiveFCST_3/3 (due by 11:59AM Feb 10) ArchiveFCST_3/4 (due by 11:59AM Feb 11) ArchiveFCST_3/5

	(forecasting hints)			(due by 11:59AM Feb 12)
Feb 8	Optics - Part 2	Archive forecast #3 con't	4th simulation (MtnSim-Humidity applications)	MtnSim-Humid due by 11:59 AM on Feb 13
Feb 11	Chapter 4 - Humidity - Part I	Current weather forecast		
Feb 13	Chapter 4 - Humidity - Part II Discuss 4th simulation (MtnSim-humidity applications)	Current weather forecast		
Feb 15	**1st hour exam - Chapters 1-3 and optics. It will also include questions on Forecasting and simulations**			
Feb 18 Contouring due	Chapter 4 - Humidity			
Feb 20	Chapter 5 Water vapor, dew, clouds, etc. - Part I	Current weather forecast	4th simulation again (MtnSim-Adiabatic applications)	MtnSim Adiab and MtnSim AdQst due by 11:59AM on Feb 25
Feb 22	Chapter 5 Water vapor, dew, clouds, etc. - Part II	Current weather forecast		
Feb 25 MtnSim-Adiabatic due	Chapter 5 - Why clouds are different - Part I Discuss 4th simulation (MtnSim Adiabatic Applications)	Current weather forecast		
Feb 27	Chapter 5 - Why clouds are different - Part II	Current weather forecast		
Feb 29	Chapter 5 What causes rain and snow	Current weather forecast		
Mar 3	Chapter 6 - why do the winds blow? - Part I	Current weather forecast	Horiz_motion	Horiz_motion due Mar 10 by 11:59AM
Mar 5	**2nd hour exam - Chapters 4-5**	Regular forecast exercise		
Mar 7	Chapter 6 - why do the winds blow? - Part II	Regular forecast exercise		
Mar 10 Horiz_Motion due	Chapter 6 - why do the winds blow? - Part III	Regular forecast exercise		

Mar 12	Chapter 7 - Local winds	Regular forecast exercise	Winds	Winds due Mar 28 by 11:59AM
Mar 14	Question feedback and forecast day	Regular forecast exercise		
Mar 17-21	**Spring break**			
Mar 24	Chapter 7 - Global winds	Regular forecast exercise		
Mar 26	Chapter 7 - Jet winds	Regular forecast exercise		
Mar 28 Winds due	Chapter 7 - El Niño	Regular forecast exercise	AirMs_Fronts	AirMs_Fronts due Apr 9 by 11:59AM
Mar 31	**3rd hour exam Chapters 6-7**			
Apr 2	Chapter 8 - Air Masses	Regular forecast exercise		
Apr 4	Chapter 8 - Air masses and fronts	Regular forecast exercise		
Apr 7	"An inconvenient truth" – video day	Regular forecast exercise		
Apr 9 AirMs_Fronts due	Chapter 9 - Wave cyclone theory	Regular forecast exercise		
Apr 11	Chapter 9 - Development factors - Part I	Regular forecast exercise	Rmte_Sensing	Rmte_Sensing due Apr 21 by 11:59AM
Apr 14	Chapter 9 - Development factors - Part II	Regular forecast exercise		
Apr 16	Chapter 10 - Guest lecturer Dr. William Gallus on tornadoes (videos)	Regular forecast exercise		
Apr 18	**4th hour exam Chapters 8-9 (CN)**	More tornado videos		
Apr 21 Rmte_sensing due	Chapter 10 - Lightning and thunder	Regular forecast exercise	Hurricane	Hurricane due Apr 25 by 11:59AM
Apr 23	Chapter 10 - Thunderstorms	Regular forecast exercise		
Apr 25 Hurricane due	Chapter 11 - Hurricanes	Regular forecast exercise		
Apr 28	Chapter 13 - Air pollution and ozone	Regular forecast exercise	Last chance for extra credit (Monday)	
Apr 30	Chapter 14 - Climate changes - Part I	Regular forecast exercise		
May 2	Chapter 14 - Climate changes - Part II	Regular forecast exercise		
May 5-9	**Final exam (TBA) 125 Kildee**	**Chapters 10,11,13, 14**		