Course Syllabus
Atmospheric Sciences 2940:Basic Meteorology

Instructor: Alvaro Montenegro
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Class Meetings: Lecture MWF 1:50-2:45*

Classroom: Denney Hall 253

Office hours: By appointment.

Course Objectives: The basic objective of this course is to introduce students to the fundamentals of meteorology. Students will be introduced to the physical laws that form the basis for our understanding of atmospheric processes. The physical processes will be integrated to explain basic atmospheric phenomena. Knowledge of the physical laws and their applications to meteorology will facilitate students' comprehension of meteorological processes that determine the weather. The increased comprehension of important physical processes will improve students' ability to analyze and to forecast the state of the atmosphere. It will enable students to understand more clearly atmospheric phenomena on many temporal and spatial scales.

Course Structure: In person. Lectures slides are available on Carmen. Lectures will present material on the fundamental principles that affect the Earth's atmosphere and their application to atmospheric situations. Important equations and their implications will be presented. Examples of meteorological problems will be discussed. Problems that involve the review of concepts and application of material introduced in class will also be assigned and discussed during lectures.

Textbooks: There is no required textbook for this course but if students want a book to use as a source of additional information here are two suggestions:

Meteorology Today: An Introduction to Weather, Climate and the Environment by C. Donald Ahrensentitled,12th edition, Thompson Brooks/Cole is a good source. The 11th to 9th editions could be used in place of the 12th edition.

Understanding Weather and Climate, 7th edition by E. Aguado and J. E. Burt, 2012. Pearson Education, Inc. Upper Saddle River, NJ. (ISBN: 9780321769633). The 6th or 5th editions could be used in place of the 7th edition.

Grade generating Activities

The overall course grade will be determined according to student performance in the following activities and weights:

Activity	Weight	Due Date
Exam 1	16%	Feb 7
Exam 2	17%	Mar 19
Exam 3(Final)	17%	Apr 21
Problem sets	25%	TBA
Term paper	25%	Outline(5%): Mar 21; Final Report(20%): Apr 21

A note on due times and tardiness: Unless otherwise noted, "due date" stands for 11:59 PM of the due date. Late work not justified by a university-sanctioned excuse can be turned in up to one (1) week after its due date and will be discounted in 10%. No late unexcused submissions will be accepted after one week of their due date.

A note on final course grades:

The course adopts the following numerical-to-letter grade conversion:

Numerical Final Course Grade	Letter Final Course Grade
92.5-100	A
89.5-92.4	A-
86.5-89.4	B+
82.5-86.4	B
79.5-82.4	B-
76.5-79.4	C+
72.5-76.4	C
69.5-72.4	C-
66.5-69.4	D+
59.5-66.4	D
0-59.4	E

Final course numerical grades will be rounded to the closest decimal value prior to conversion to a letter grade. Unless an error in grade calculation is noted, no other adjustments will be made.

For example: A student obtaining a final course numerical grade of 89.45 will have their grade rounded to 89.5 and will have earned an A- as final course letter grade. A student obtaining a final course numerical grade of 89.44 will have their grade rounded to 89.4 and will have earned a B+ as final course letter grade.

Exams: All three exams are individual efforts, open book and conducted online. While exams will remain available on Carmen between 6:00 AM and 11:59 PM of their due date, once students begin to take an exam, they will have 80 minutes to finish it. Note that to have access to all 80 minutes, students should start taking the exam no later than 11:40 PM of the due date. Reinforcing with an example, students will be able to start taking the exam at 11:55 PM of the due date, but if they choose to do so, they will only have 5 minutes to answer questions before being locked out of it.

Exam format will be a mixture of multiple choice and short essay questions. Some questions will involve calculations similar to those required by the problem sets.

Exams are designed to test your comprehension and understanding of the material, as well as your ability to recall basic meteorological principles.

Exams are not cumulative, but some concepts are important for many of the themes presented in the course and are likely that questions on these appear in more than one exam.

Make-up exams are only allowed in the case of university sanctioned absences, a documented emergency or through **PRIOR** consent of the instructor.

Problem sets: Problem set assignments are designed to accomplish several goals. The first goal is to give students some experience solving basic meteorological problems using concepts introduced in class. A second goal is to make students think about the physical processes that occur in certain atmospheric phenomena. More challenging problems may require students to combine physical principles in order to arrive at the solution to the problem. Some problems will be similar to the tasks require of operational meteorologists. Other problems will deal with fundamental principles and calculations that are used to develop meteorological models and software.

Collaboration between students is encouraged for all course activities. That being said, the work on a problem set is expected to be the work of the student whose name appears on it. **Copying another student's work is plagiarism and is considered to be academic misconduct.** Students who engage in this behavior will be reported to COAM.

A note on units: Numerical answers are incomplete unless they are accompanied by the correct units. Students will lose points on examinations and problem set assignments if the units are incorrect or missing.

Term paper: Students will hand in a document containing a weather event case study. While students are welcome to generate the case study based on available meteorological data, the expectation is for students to generate a report based on already published case studies. Term papers are due on Apr 24, last day of classes. Prior to the final term paper report, students must present a short report outline (~ 1 page) by Mar 21.

The term paper is an individual effort.

The outline should contain:

- The event to be studied
- Section headers with title and short (one to two sentences) description of section content
- A partial list of references

Final report submissions should:

- Range from 2000 to 3000 words, not including list of references and figure captions
- Contain at least 2 figures
- Make correct use of citations
- Contain a reference list.
- Be based on at least one peer reviewed publication

More information about the term paper, including material to help students develop a case study, and a rubric will be available in the course's Carmen Final Project Module.

Extra Credit

Syllabus test: There is the potential for 0.5 extra credit point on the final course grade for those who turn in a perfect syllabus test. The test is available on Carmen and should be submitted online via Carmen by the end of the day (11:59 PM) on Wednesday, Jan 22. There will be no partial grades. To get the 0.5 extra credit point all responses must be correct. One error = no extra credit.

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct (COAM) to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. The Code of Student Conduct defines "Plagiarism is the representation of another's works or ideas as one's own; it includes the unacknowledged word-for-word use and/or paraphrasing of another person's work, and/or the inappropriate unacknowledged use of another person's ideas." Instructors shall report all instances of alleged academic misconduct to the Committee (Faculty Rule 3335-5- 847). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).

Disability Services: Students with disabilities that have been certified by the Office for Student Life Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their accommodations. The Office for Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614-292-3307, VRS 614-429-1334; http://www.ods.ohio-state.edu/.

List of lecture topics, in their order of presentation*

1. Introduction (Chapter 1) **
2. Radiation and the Energy Balance (Chapter 2)
3. Atmospheric Temperature (Chapter 3)
4. Atmospheric Thermodynamics (Chapter 2,3)
5. Clouds and Precipitation (Chapters 5, 6 and 7)

6. Atmospheric Dynamics (Chapters 8, and 9)
7. Air Masses, Fronts and the Extratropical Cyclone (Chapters 9 and 10)
8. Thunderstorms, Tornadoes and Hurricanes (Chapters 11 and 12)
9. Urban Effects on Weather (Chapter 14)
10. Climate and Climate Change (Chapters 15, and 16)

** This is a tentative list. Eventual changes to themes and order of presentation might take place.

*Chapter numbers refer to those on *Understanding Weather and Climate*, 7th edition by E. Aguado and J. E. Burt, 2012