

Course Syllabus

Atmospheric Sciences 2940: Basic Meteorology

Class Meetings: MWF 1:50-2:45 p.m.

Classroom: Derby Hall 048

Instructor: Jay Hobgood

Office: Room 1100 Derby Hall

Office phone: 292-3999

Office hours: MWF 12:30-1:30 or by appointment

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Course Prerequisites: Math 152 or 1151 and Physics 132 or 1251

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: The class will meet three days per week for 55 minutes each day. Lectures during the classes will present material on thermodynamic processes and their application to atmospheric situations. Important equations will be derived and the implications of assumptions will be discussed. Examples of meteorological problems will be discussed. Homework problems that involve the application of material introduced in class will also be assigned and discussed in class.

Textbook: There is no required text book for this course. If students want a book to use as a source of additional information, then the book written by C. Donald Ahrens entitled *Meteorology Today: An Introduction to Weather, Climate and the Environment*, 10th edition, Thompson Brooks/Cole is a good source. (Note the content of the 9th edition is very similar and may be used in place of the 10th edition. The 11th edition may also be used.)

Course requirements:

1. The **first examination** will occur on **February 7, 2018** and will comprise 20% of the course grade.
2. The **second examination** will occur on **March 7, 2018** and will comprise 20% of the course grade.
3. The **final examination** will occur at 4:00-5:45 on **Tuesday May 1, 2018** and will comprise 30% of the course grade.
4. Sets of **problems** will be assigned in class and will comprise 20% of the final grade.
5. A **review** of one of the presentations given at the 22nd Severe Weather Symposium that is to be held in the Ohio Union on Friday March 9, 2018. The symposium review should be between two and five double spaced pages in length. The final draft of the review is due on **Friday March 23, 2018**. The review of a symposium presentation will comprise 10% of the final grade.

Extra Credit: Students will be given two chances (and only two) to earn extra credit. A ten question multiple choice quiz will be given on Friday January 12, 2018. Students will receive a 1% extra credit (equal to five points on an examination) to their final grade for answering all of the questions. A student will receive an additional 0.1% of extra credit for each question they answer correctly. A ten question multiple choice quiz will be given on Monday April 23, 2018. Students will receive a 1% extra credit (equal to five points on an examination) to their final grade for answering all of the questions. A student will receive an additional 0.1% of extra credit for each question they answer correctly. There will be no makeup quizzes for the extra credit.

Examination format: Each examination will begin with a series of terms to define in one or two sentences. You will have a choice of which terms you choose to define. The remainder of the examination will consist of short answer questions, short essay questions that you can answer with a few sentences and problems like the problems that will be assigned as homework. The examinations are designed to test your comprehension and understanding of the material, as well as your ability to recall basic meteorological principles.

Homework assignments: The homework 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. Homework assignments are expected to be the work of the student whose name appears

on them. Copying another student's work is *plagiarism* and is considered to be *academic misconduct*.

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

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct 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 Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for 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 Topics

- Part I: Introduction (0.5 weeks)
(Chapter 1)
- Part II: Radiation and the Energy Balance (1.5 weeks)
(Chapter 2)
- Part III: Atmospheric Temperature (1.5 weeks)
(Chapter 3)
- Part IV: Atmospheric Thermodynamics (1.5 weeks)
(Chapter 7)
- Part V: Clouds and Precipitation (2.0 weeks)
(Chapters 5, 6 and 8)
- Part VI: Atmospheric Dynamics (1.5 weeks)
(Chapters 9, 10, and 11)
- Part VII: Air Masses, Fronts and the Extratropical Cyclone (1.5 weeks)
(Chapters 12 and 13)
- Part VIII: Thunderstorms, Tornadoes and Hurricanes (2.0 weeks)
(Chapters 15 and 16)
- Part IX: Urban Effects on Weather (0.5 week)
(Chapter 14)
- Part X: Climate and Climate Change (1.5 weeks)
(Chapters 17, 18 and 19)

Review of a Symposium Presentation

On March 9, 2018 the Meteorology Club will host the 22nd Annual Severe Weather Symposium. Additional materials on the schedule and a list of Speakers at the symposium will be given out in class. I encourage you to attend as many of the presentations as you can because many of the speakers are experts in their field. Class does not meet on that day which may make it easier for you to be able to attend the symposium. In your review I want you to summarize the presentation and to include your own opinions about the effectiveness of the presentation. You will have had two and a half months of meteorology by the date of the symposium and I don't expect to be able to understand complex theories that we have not yet discussed in class. However, the presentations should be sufficiently general so that you can understand most of the material. In your review you should:

1. Summarize the main points made by the speaker.
2. Discuss your ability or inability to understand the points the speaker was trying to make.
3. Discuss the overall effectiveness of the presentation including the reaction of the the audience listening to the talk.

The final draft of the review is due on Friday March 23, 2018.