

Syllabus

SEVERE AND UNUSUAL WEATHER

Class Information: 3 credits, no lab  
Lectures: Mon, Wed, Fri: 9:30-10:20  
Location: Sarkeys Energy Center, room N202

Lecturer: Jana Houser  
Email: Jana.B.Houser-1@ou.edu  
Full-time office: 5355 National Weather Center (NW corner of building)  
Office Phone: 325-1935 (NWC)  
Office hours office: Sarkeys 526  
Office hours: 10:20 – 11:30 Mondays, by appointment, or  
anytime I am in my NWC office and you choose to stop by.

Grader: (homework only)  
Lindsay Tardif  
Email: tard6939@ou.edu

Course Prerequisites: None

Course Goals: 1) Gain a thorough understanding of atmospheric properties such as temperature, moisture, pressure and density and how they are related.  
2) Gain an understanding of daily weather events and conditions.  
3) Recognize weather phenomena using surface, radar and satellite data.  
4) Understand the causes, formation, evolution and impacts of various types of weather, with emphasis on severe weather events.  
5) Identify regions favorable for the development of various types of severe weather using a variety of observational meteorological tools.

Textbook: Severe and Hazardous Weather 3<sup>rd</sup> edition by Robert Rauber, John Walsh, and Donna Charlevoix  
ISBN: 978-0-7575-5043-0  
Website for the textbook: <http://severewx.atmos.uiuc.edu>

Grade Distribution:

Exams (4): 60%

Homework: 20%

In-class Activities: 10% (Graded for completion only)

Weather Log 10%

Exams: There will be four exams for this course: three midterms (15% each) during the semester, and a final exam (15%). The final exam will be cumulative. Midterm exams are tentatively

planned to be given on: **9/24, 10/29 and 12/1**. **\*These dates are subject to change depending on class pace and other unforeseen circumstances.** The final exam will be on Tuesday 12/14.

Homework: There will be between 6 and 8 homework assignments over the duration of the semester, approximately every two weeks except exam weeks. The purpose of homework is to demonstrate the student's ability to apply, in a variety of ways, concepts taught and discussed in class. Homeworks are due at the BEGINNING of class on the specified due date. You may work with a partner, but copied homeworks will NOT be accepted and will earn a 0 on the assignment. For questions requiring math, it is expected that the necessary mathematical steps are provided, not just an answer.

Activities: At the end of class, sometimes there will be a few minutes in which students will participate in a variety of activities to reinforce the lecture material for that day. Additionally, when class material permits, small experiments or demonstrations will be done in which students will answer short questions before and after the activity. If time permits, special class-long activities may be done. Grading of all activities in this category will be done purely based on completion and not on correctness.

Class Participation: Show up for class and participate in the lectures. Students who demonstrate exceptional attendance and participation may be eligible for up to a 2% bonus in their final grade. Attendance will be taken in one way or another!

Policies:

1. Class will begin AT 9:30 whether you are here or not. Please try not to be late.
2. Homeworks can be turned in late for a deduction of 10% per day late.
3. No homeworks will be accepted after answer sheets have been distributed.
4. Make-up exams will only be allowed if arrangements have been made prior to the exam date and will only be accepted for reasonable circumstances.
5. There will be no make-up for the final, unless it is a University-wide make-up. (i.e. the University closes on test day for some reason and a make-up is required)
6. You are expected to show up to class.
7. Grades will be posted on Desire to Learn (<http://learn.ou.edu>)
8. If you have special needs, please see <http://drc.ou.edu> for info

Lectures: Lectures will be done predominantly using a Powerpoint slides. Outlines of the lectures and important figures will be available on Desire to Learn (Under 'content' section) before the class period. It is recommended that students print off the lectures and bring them to class to take notes.

Grading: Final grades will be made according to the standard system:

≥90: A  
80-90: B  
70-80: C  
60-70: D  
<60: F

Academic Integrity: According to the University of Oklahoma, “**Academic integrity means honesty and responsibility in scholarship.**” Don’t cheat, don’t copy, don’t plagiarize. If academic misconduct is suspected, the student will be approached. For serious violations (cheating on exams, plagiarism, etc) it is required that the instructor involve the university. Penalties are twofold: “**There are two parts to the penalty in any misconduct case: the grade penalty and the university penalty. The grade penalty is imposed by the instructor. It can range from a lower grade on the affected work to an F for the course. In some cases, the professor may require extra work before the course can be completed. The University penalty is imposed separately from the grade penalty. University penalties range from a "censure" (an official reprimand, recorded as a note in the student's file), to *community service to suspension* for one or more semesters to *expulsion* in the case of repeat or especially bad offenses. Suspensions and expulsions are also noted on the student's transcript. At the University's option, transcript notations can be temporary or permanent” (OU)**

For more information, go to: <http://www.ou.edu/provost/integrity/>

Needed Disclaimers:

*"The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone 405/325-3852 or TDD only 405/325-4173."*

Course Outline

\*Subject to change depending on time availability

Introduction

- Properties of the atmosphere (temperature, pressure, moisture, etc)
- Atmospheric structure
- Measuring meteorologic variables (surface, upper air, satellite, radar)
- Data on weather maps

Physical Concepts

- Forces in the atmosphere
- Force balances
- Properties of the wind
- Atmospheric stability

Tropical Cyclones

Large-Scale ('Synoptic') Weather Basics

- Highs and Lows
- Airmasses
- Jetstreams
- Fronts
- Extratropical Cyclones

Thunderstorms and associated phenomena

- 'Ordinary' thunderstorms
- Mesoscale convective systems / squall lines
- Lightning
- Hail
- Downbursts/microbursts/MCCs
- Supercells
- Tornadoes

Winter Weather

- Freezing precipitation and ice storms
- Cold waves
- Blizzards
- Lake-effect snow