

METR 2603-001
Severe & Unusual Weather
Spring 2012
MWF 9:30–10:20am DEH 0120

Instructor: Amanda Kis

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Office hours: Mondays 1–3 pm (Action Center, Wagner Hall 140) or by appointment

Text: Severe & Hazardous Weather (3rd Edition), Robert M. Rauber, John Walsh, and Donna Charlevoix. ISBN: 978-0-7575-5043-0
<http://severewx.atmos.uiuc.edu/>

Desire2Learn: <https://learn.ou.edu> (log in with your 4x4)

Please refer to this website often as I will post announcements (if necessary) and content. Grades will be posted here unless you have requested to have them withheld.

Course catalog description: Provide non-majors and majors a detailed descriptive account of the physical processes important in the formation of various severe and unusual weather phenomena including: thunderstorms, tornadoes, hail storms, lightning, hurricanes, midlatitude snowstorms, lake effect snows, atmospheric optical effects, and global climate change. This course does not count for major credit in the School of Meteorology.

Goals and objectives: The topics and framework of this class are designed to help you (1) recognize the importance of weather to your lives and careers; (2) make you aware of weather-related hazards, especially in Oklahoma; and (3) give you resources to assess hazardous weather conditions and react accordingly. We will use a combination of lecture notes and activities to achieve these objectives.

Office hours & special appointments: Office hours will be held for four hours every week in two two-hour sessions. Office hours are scheduled for Mondays and Tuesdays between WHEN in WHERE. Every Monday office hours session will be held as an Action Center

If you need to set up a special appointment outside of office hours, please contact me via email at akkis@ou.edu. Special appointments will be set up on a two-strike basis: If you schedule a special appointment but don't show up, I will give you one more chance to schedule a special appointment. If you also fail to show up for that appointment, I will not schedule any more special appointments. If you give me at least 12 hours notice, I will not count a no-show as a strike

Homework: There will be between 6 and 9 homework assignments during the semester. The purpose of the homework is for the student to demonstrate that they can apply the concepts discussed in class. Students may work together on homework assignments, but copied homework assignments will not be accepted and will earn 0 points. Please

understand that “working together on an assignment” does not mean copying—students are expected to arrive at their solutions independently, and be able to justify their solutions. Significant similarities between solutions may be taken as evidence of improper collaboration.

Unless otherwise stated, homework will be due one week from the day it is assigned at the beginning of class. Late homework will only be accepted when accompanied by University-approved excuses. If you know in advance of a University-approved reason that you will be turning in a late homework, please contact me about it as soon as possible, preferable a week in advance.

Written assignment formatting: Unless otherwise specified, any written assignment should be typed and formatted with 1” margins (top, bottom, right, left), double-spaced, 12 point Times New Roman font. Supporting figures should be attached at the end of the document with appropriate captions, and do not count toward a required page total.

In-class activities: On pre-determined class days, short in-class activities will be given to students to hand in by the end of class. In-class activities will range from a variety of options that include short quizzes, summaries, fill-in-the-blank activities, concept mapping, and group work. In-class activities will be graded as following:

- Outstanding: 10 points (demonstrate clear understanding of and/or application of topic)
- Satisfactory: 5 points (demonstrate some understanding of topic)
- Unsatisfactory: 2 point (participate in assignment but demonstrate no understanding of topic)

Activities not handed in will receive 0 points.

Each in-class activity will be worth up to 10 points, and 15 in-class activities are scheduled. A maximum of 100 points may be earned with in-class activities. No bonus credit will be given after 100 points are reached.

If the date of an in-class activity has to be re-scheduled, I will attempt to give the class at least one week notice.

It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of required classwork that may fall on religious holidays. Any student who has a religious holiday fall on one of the scheduled in-class activity days, please see me no later than one week prior to the activity so that we can make arrangements.

End-of-semester project: A short project will be assigned near the end of the semester. This project isn’t meant to stress you out, but instead to allow you to apply concepts you have learned to real-life forecasting. To that end, this project is worth 4.6% of your total grade. Further details about the project will be given after the second exam.

Exams: Three exams will be held during regular class times during the semester. Each exam is designed to take 45 minutes and is worth 100 points. Exams will use a variety of question formats that include short-answer, matching, labeling pictures, etc. Two class periods before each exam, a list with relevant topics and a general description of the exam will be posted in D2L. Questions can be asked during the class period directly before the exam.

Please write legibly on your exams. If I cannot read an answer, they will be deemed incomplete/wrong and you will lose points.

Five bonus points will be available for each exam, including the final, to students who fill out both a pre-exam survey (posted on D2L 3 days before the exam and taken down during the exam) and a post-exam survey (posted on D2L during the exam and available for 3 days). These surveys are for my benefit—I am constantly trying to improve my teaching methods, and appreciate your feedback.

Grades may be disputed up to a week after the exams are handed back. After a week has passed, grades may not be changed.

Exams must be taken during the scheduled time. Only University-approved excuses will be accepted for missing an exam. For such excuses, a make-up exam will be scheduled on a date during which both the teacher and the student will be available. Since the same exams given to the class cannot be administered after the scheduled exam date, the make-up exam will consist of 5 essay questions, each at least 2 pages long.

The final exam will be administered from 8–10am on Friday May 11, 2012 in DEH 0120. The final exam will be comprehensive, and is worth 120 points.

It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations that may fall on religious holidays. Any student who has a religious holiday fall on one of the exam days, please see me no later than one week prior to the exam so that we can make arrangements.

Grading: A total of 650 points may be earned during the course of the semester. Points are divided as following:

Homework: 15.4% (100 points)
In-class activities: 15.4% (100 points)
End-of-semester project: 4.6% (30 points)
3 mid-term exams: 15.4% each for 46.2% total (100 points each, 300 points together)
Final exam: 18.5% (120 points)

All homework assignments, projects, and exams will be graded according to the standard scale:

- A: $\geq 90\%$
- B: 80–89%
- C: 70–79%
- D: 60–69%
- F: $<60\%$

The same scale will also determine the total grade for the course:

- A: 585–650 points
- B: 520–584 points
- C: 455–519 points
- D: 390–454 points
- F: 389 points or below

Accommodation of students with disabilities: The University of Oklahoma is committed to providing reasonable accommodation for students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the instructor 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. You may contact the office at 405-325-3852 (voice) or 405-325-4173 (TDD).

Academic misconduct: Cheating and other academic misconduct will not be tolerated and will be reported. No exceptions, no excuses. Those found cheating will be penalized under the OU Academic Misconduct Code, which can be found at <http://www.ou.edu/provost/integrity>. In short, if you cheat, expect to be removed from the course and to receive an F for the course. All alleged instances of academic misconduct will be investigated and, if substantiated, appropriate admonitions will be imposed. Please read <http://www.ou.edu/provost/integrity-rights> for further information.

Working together on homework assignments is encouraged in this class, and using other students as a resource is a great way to learn in a field such as meteorology. However, the work you submit **MUST** be your own work. Any student caught copying off another student will be penalized.

Tentative lecture schedule

- Week 1 (1/18-1/20): Introduction to weather
Lecture 1: Class overview + Why do we have weather?
Lecture 2: Why do we have weather? A global perspective
- Week 2 (1/23-1/27): Introduction to weather (continued)
Lecture 3: Why do we have weather? A national perspective
Lecture 4: Why do we have weather? A local perspective
In-class activity #1: Summary exercise
Lecture 5: Surface weather maps & analysis
In-class activity #2: Surface map contouring
- Week 3 (1/30-2/3): Winter weather
Lecture 6: Winter weather: Precipitation types
Lecture 7: Winter weather: Ice storms
In-class activity #3: Summary exercise
Lecture 8: Winter weather: Snow storms, blizzards, and lake effect snow
- Week 4 (2/6-2/10): Heat waves, droughts, and fire weather
Lecture 9: Heat waves and droughts, pt. 1
In-class activity #4: Examining summer 2011 in Oklahoma
Lecture 10: Heat waves and droughts, pt. 2
Lecture 11: Fire weather
In-class activity #5: TBD
- Week 5 (2/13-2/17): Floods & tropical cyclones
Lecture 12: What are floods? & Historical floods
Lecture 13: Tropical cyclones +In-class exam review
Lecture 14: EXAM 1
- Week 6 (2/20-2/24): Atmospheric properties
Lecture 15: Vertical structure of atmosphere, pt. 1: Overview
In-class activity #6: Diagramming the atmosphere
Lecture 16: Vertical structure of the atmosphere, pt. 2: The troposphere
Lecture 17: Airmasses
In-class activity #7: TBD
- Week 7 (2/27-3/2): Measurements, observations & introduction to thunderstorms
Lecture 18: Wind properties
In-class activity #8: Streamline activity
Lecture 19: Radar
Lecture 20: Satellite
In-class activity #9: Satellite comparison exercise
- Week 8 (3/5-3/9): Thunderstorms & Severe storms
Lecture 21: Overview of storm types
Lecture 22: Squall lines
In-class activity #10: TBD
Lecture 23: Mesoscale convective systems
- Week 9 (3/12-3/16): Severe storms continued
Lecture 24: Supercells, part 1: Supercell formation and structure
Lecture 25: Supercells, part 2: Hailstorms + In-class exam review

- Lecture 26: EXAM 2 (details about end-of-semester project released)
- Week 11: SPRING BREAK! (3/17-3/25)
- Week 12 (3/26-3/30): Tornadoes
- Lecture 27: Tornadoes, part 1: Tornado formation + discussion of end-of-semester project
 - Lecture 28: Tornadoes, part 2: Nocturnal tornadoes
 - Lecture 29: Tornadoes, part 3: Tornado outbreaks & tornadoes in Oklahoma
 - In-class activity #11: TBD
- Week 13 (4/2-4/6): Forecasting severe weather
- Lecture 30: Weather models
 - Lecture 31: Government & private forecasting entities
 - Lecture 32: The Storm Prediction Center
 - In-class activity #12: Understanding SPC products
- Week 13 (4/9-4/13): Mountain weather
- Lecture 33: Overview of mountain weather
 - In-class activity #13: TBD
 - Lecture 34: Mountain windstorms
 - Lecture 35: Wave clouds
- Week 14 (4/16-4/20): Atmospheric optics
- Lecture 36: Lightning
 - Lecture 37: Optical phenomena + In-class review
 - Lecture 38: EXAM 3
- Week 15 (4/23-4/27): Aviation meteorology & climate change
- Lecture 39: Aviation meteorology
 - In-class activity #14: TBD
 - Lecture 40: Global climate change, pt. 1
 - Lecture 41: Global climate change, pt. 2
 - In-class activity #15: TBD
- Week 17 (4/30-5/4): DEAD WEEK
- Lecture 45: Review of popular topics TBA
 - Lecture 46: Review of popular topics TBA
 - Lecture 47: Comprehensive review