

**SEVERE AND UNUSUAL WEATHER**  
***Atmospheric Science 10 (3 units)***  
**Fall 2004, MW 11:00-11:50, Veihmeyer 212**  
**G.E. Credit: Science and Engineering; Writing**

**INSTRUCTOR:** Professor Richard Grotjahn, 231 Hoagland Hall  
Phone: 530 752-2246; e-mail: [grotjahn@ucdavis.edu](mailto:grotjahn@ucdavis.edu)  
Department of Land, Air and Water Resources, UC-Davis  
Office hours: by appointment

**TEACHING ASSISTANTS:** Jessica Dyke contact: [jldyke@ucdavis.edu](mailto:jldyke@ucdavis.edu) office hrs:  
Phil Weir: contact: [pcweir@ucdavis.edu](mailto:pcweir@ucdavis.edu) office hrs:  
( Muhtarjan Osman: contact: [mjosman@ucdavis.edu](mailto:mjosman@ucdavis.edu) office hrs: N/A )  
Location for TA office hours: 124 Hoagland

<b>DISCUSSION SECTIONS:</b>	CRN63308	2:10-3:00 Thursday	<b>124 Hoagland</b>
	CRN63309	3:10-4:00 Thursday	<b>124 Hoagland</b>
	CRN63310	12:10-1:00 Friday	<b>124 Hoagland</b>
	CRN63311	1:10-2:00 Friday	<b>124 Hoagland</b>

**TEXTBOOK:** *Meteorology Today: An Introduction to Weather, Climate and the Environment*, C.D. Ahrens, Brooks/Cole, 2003, Seventh Edition

**COURSE GOALS:** To learn scientific methods and principles and apply those techniques to analyze and understand the physical processes underlying various types of severe or unusual weather.

**GENERAL INFORMATION:**

**PREREQUISITE** – High school physics.

**COURSE FORMAT** – Two lectures per week emphasizing concepts, relevant principles, and applications of interpretive techniques. One discussion hour per week for clarifying selected issues, for introducing complementary material, and for general discussion of the homework.

**EXAM FORMAT** – One mid-term exam and a final exam are scheduled for the dates shown on the syllabus. **Exams are closed book.** The exams are multiple choice, true/false, and short essay questions addressing identification of selected terms, concepts, or principles covered during the periods specified on the syllabus. **No** make-up midterm will be provided. Make-up final is **not** allowed except for verifiable emergency circumstances.

**HOMEWORK (HW)** – HW is **due at the beginning of the lecture** on the announced date which is often one week after it is assigned. These dates are indicated on the syllabus. Timing of assignments and due dates if affected by holidays. HW assignments consist of problem solving and a minimum of one page of type written (double-spaced) response. HW is collected at the lecture, or it can be left in the envelope designated for ATM 10 homework attached to the office door at 231 ( Hoagland Hall). However, **the security of this envelope is not monitored and proof of HW submission is the student's responsibility.** Do not submit homework by e-mail. All HW must be your personal and individual work and completed in your own words. Written work must be clearly and concisely presented in a typewritten form, using appropriate vocabulary, grammar, and punctuation. Word processor software use is encouraged for all text on assignments. Some drawings may be done by hand. Use appropriate citations (author, date, title, and journal title, volume and page numbers) when referring to published work. **No credit is given to any student whose homework is virtually identical to the work of another student.**

**LATE HOMEWORK POLICY** – No credit is given for HW submitted after the specified due date and time.

**COURSE GRADE** - The mid-term exam contributes 30% of the course grade, and the final exam contributes 40% of the course grade. Homework contributes 30% of the course grade. The point values for graded work are adjusted on the basis of the assigned percentage weightings. The letter grade for the course is determined by the class distribution of the total accumulated weighted points relative to the total possible weighted points. Assignment of letter grades is guided by the constraint that 87% cannot be lower than an A-, 77% cannot be lower than a B-, 67% cannot be lower than a C-, and 57% cannot be lower than a D-.

**COURSE WEB PAGE** – The course web page for ATM 10 can be accessed via the my.ucdavis course site, from the TRC server, from the instructor's homepage, or at <http://atm.ucdavis.edu/~grotjahn/course/atm10/index.html> (presently under construction)

Final Examination 1:30 a.m. – 3:30 a.m. Saturday, December 18, 2004

# SEVERE AND UNUSUAL WEATHER

		<u>Topic</u>	<u>Reading sections*</u>	<u>Homework**</u>
Sept.	30	Discussion 1- Course administration		
Oct	1			
	4	Course intro, atm: composition & structure (L1)	1-13, 17-18	
	6	Units, P & p, Energy, T, ideal gas (L2)	28-39, 220-221	A#1
	7-8	Discussion 2		
	11	Moisture and cloud types (L3)	108-120: 142-151	
	13	Stability and lapse rate (L4)	166-173	D#1, A#2
	14-15	Discussion 3		
	18	Cloud Development and odd clouds (L5)	173-182; 151-155	
	20	Scattering, Refraction, & Optical phenomena (L6)	86-105	D#2, A#3
	21-22	Discussion 4		
	25	Air Pressure, Forces, hydrostatic balance (L7)	218-231, 243	
	27	Coriolis, geostrophic gradient & surface wind (L8)	231-243	D#3
	28-29	Discussion 5: Exam preview		
Nov	1	<b>Mid-term exam</b> (October 4-27)		
	3	Unusual & severe local winds (L9)	178-179, 182, 264-268, 270-274	A#4
	4-5	Discussion 6		
	8	General Circulation & jet streams, (L10)	56-59, 284-290, 292-297	
	10	air masses, fronts, & Frontal cyclones (11)	314-315, 324-331	D#4,A#5
	11-12	<b>11<sup>th</sup> is Veteran's Day.</b> Discussion 7		
	15	Blizzards & freezes (L12)	205-207, 317, 343, 320-321, 353-355	
	17	Dryline, Thunderstorms (L13)	332, 398-408	
	18-19	Discussion 8		
	22	Hail & Lightning (L14)	208-210, 412-418	
	24	Tornadoes (L15)	419-432	D#5,A#6
	25-26	<b>Thanksgiving holiday</b>		
	29	Tropical weather: Thunderstorms, monsoons & el nino (L16)	268-269, 303-306,	
Dec	1	Hurricane structure & formation (L17)	438-446	
	2-3	Discussion 9		
	6	Hurricane damage, notorious storms (L18)	446-457	
	8	Floods (snowmelt, Thunderstorms) (L19)	205,408-410,411	D#6
	9-10	Discussion 10: Exam preview		
<b>Dec</b>	<b>18</b>	<b>FINAL EXAM 1:30-3:30</b> (comprehensive)		

\* All readings are from Ahrens, 7<sup>th</sup> Edition (2003).

\*\* 'A' indicates the HW is assigned; 'D' indicates the HW is due.