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w 28 Nov Group presentations Final Project Report	W 28 Nov	Group presentations	Final Project Report
M 3 Dec Group presentations	M 3 Dec	Group presentations	~ ~ ~ ~

\*assignment completed before class meets on this date

### Description

A course designed for the undergraduate major which examines the fundamental energetics driving the atmospheric heat engine. The specific application of the fundamental concepts will be toward developing understanding and insights related to thunderstorm development and equipping the student with tools that will serve as aids in thunderstorm forecasting.

# Outline

Vertical Structure of Atmosphere (WH, 1.3.4) Thunderstorms (WH, 8.3.2) The Vertical Equation of Motion (WH 7.3.2) The Gas Laws (WH 3.1) Hydrostatic Equation (WH 3.2) First Law of Thermodynamics (WH 3.3) Adiabatic Processes (WH 3.4) The Second Law of Thermodynamics and Entropy (WH 3.7) [except WH 3.7.3] Water Vapor in the Air (WH 3.5) Phase of Water and Latent Heats (WH 3.5.2) The Clausius-Clapeyron Equation (WH 3.7.3) The Concept of Static Stability (WH 3.6) Thermodynamic Diagrams – Skew T, Log P (Remer lectures) **Useful Diagnostic Parameters** CCL, LCL, Tw, 0w, Te, 0e, etc. Parcel Method - Stability Indices Slice Method - Stability Indices Planetary Boundary Layer basics (*time permitting*, WH 9.3, 9.4) **Student Group Presentations** 

# Grading

Homework	10%
Exam I	20%
Exam II	20%
Exam III	20%
Final Exam	25%
Presentation	5%
Total	100%
$92\% < \text{total score} \le 100\%$	А
$90\% < \text{total score} \le 92\%$	A-
$88\%$ < total score $\leq$ 90%	B+
$82\% < \text{total score} \le 88\%$	В
$80\% < \text{total score} \le 82\%$	B-
$78\% < \text{total score} \le 80\%$	C+
$72\% < \text{total score} \le 78\%$	С
$70\% < \text{total score} \le 72\%$	C-
$68\%$ < total score $\leq$ 70%	D+
$60\% < \text{total score} \le 68\%$	D
total score $\leq 60\%$	F

### Homework

Homework will be assigned throughout the semester and is intended to aid in improving your understanding of the course material contained in the lecture and reading assignments. Homework will be defined as *individual* or *group* assignments. When an assignment is designated for a *group*, each individual within the group will receive an identical grade.

### Exams I, II, and III

The mid-term exams (I, II, and III) will be primarily testing new material introduced since the previous exam or since the start of the semester.

### **Final Exam**

The final exam is a *comprehensive* exam in which all the material contained in the entire course is testable.

## Presentation

Each student will be part of a research team responsible for finding an approved journal article having as its subject a topic related to severe weather and presenting the significant findings of the article. The subject matter of the journal article must meet the approval of the instructor before 3 October 2007. The research teams will be assigned before the Labor Day weekend.

#### Assignment/Quiz/Exam Policy

Assignments are to be handed in <u>before the start of lecture</u> on the date they are due. Assignments handed in after the start of lecture are considered late until 5:00 pm on the date they are due and will be have an automatic 10% deduction from their final score. Assignments handed in after 5:00 pm on the date they are due will receive no credit.

Quizzes and Exams are written tests and will be taken on the date they are scheduled, unless circumstances (e.g. medical or loss in the family) warrant. Make-up quizzes and exams for special circumstances will consist of an individual oral graded question and answer session at a mutually agreed upon time outside of the usual class meeting time.

The lowest homework score for each individual will be *dropped* from the total homework score tabulation.

### Instructor

Doug Miller	http://facstaff.unca.edu/dmiller/
232-5158	dmiller@unca.edu

#### Textbook

"Atmospheric Science An Introductory Survey", Second Edition, by John M. Wallace and Peter V. Hobbs

supplemented by the "Atmospheric Thermodynamics" lecture notes of Prof. Fred Remer, University of North Dakota

#### References

"Introduction to Theoretical Meteorology" by S. L. Hess U.S.A.F. Technical Document Tr79-006 on Skew T- ln P Diagrams

### Disabilities

Contact Prof. Miller early in the course if you have a disability that requires special accommodations.

### **Academic Integrity**

Cheating or plagiarism results in a failed assignment, quiz, or exam on the first infraction. A second infraction results in course failure and a report to the UNCA administration. See <u>http://www.unca.edu/catalog/academicregs.html</u> under "Student Responsibilities" for a refresher on the UNCA policy.