Syllabus for ATMS 455 – Physical Meteorology – Spring 2007

Date	Topic	Reading/Homework*
W 17 Jan 2007	Intro. / Thermo. Review	WH Chapter 2
M 22 Jan	guest	
W 24 Jan	Thermodynamics Review	
M 29 Jan	guest	HW#1 due
W 31 Jan	Atmospheric Aerosol	WH 4.1
M 5 Feb	Nucleation of Water Vapor Condensation	HW#2 due, WH 4.2
W 7 Feb	"	
M 12 Feb	Warm Clouds/ Review Session	WH 4.3
W 14 Feb	Exam I	WH Ch 2, 4.1, 4.2, HW#1,2
M 19 Feb	Growth of Cloud Droplets in Warm Clouds	HW#3 due, WH 4.4
W 21 Feb	"	
M 26 Feb	Microphysics of Cold Clouds	HW#4 due, WH 4.5
W 28 Feb	"	
M 12 Mar	Artificial modification	HW#5 due, WH 5.6
W 14 Mar	Thunderstorms	WH 4.6
M 19 Mar	Review Session	Demonstration topic approved
W 21 Mar	Exam II	WH 4.2-4.5, 5.6, 4.6, HW#3-5
M 26 Mar	Spectrum…, Absorption…	HW#6 due, WH 6.1 & 6.2
W 28 Mar	Quantitative Description of Radiation	WH 6.3
M 2 Apr	Blackbody Radiation	HW#7 due, WH 6.4
W 4 Apr	Absorptivity & Emiss.	WH 6.5
M 9 Apr	Solar Radiation	HW#8 due, WH 6.6
W 11 Apr	Infrared Radiation	WH 6.7
M 16 Apr	Review Session	
W 18 Apr	Exam III	WH 6.1-6.7, HW#6-8
M 23 Apr	Scattering of Solar Radiation	HW#9 due, WH 6.8
W 25 Apr	Student demonstrations	Written report due
M 30 Apr	Student demonstrations	

*assignment completed before class meets on this date

Description

"It's the little things that count."

A course designed for the undergraduate major that examines the microscopic processes related to cloud formation and to radiation that impact atmospheric adjustment mechanisms from microscopic to global scales.

Outline

Thermodynamics Review (WH, Chapter 2) {Ch 3}
Atmospheric Aerosol (WH, 4.1) {5.4}
Nucleation of Water Vapor Condensation (WH, 4.2) {6.1}
Microstructure of Warm Clouds (WH 4.3) {6.2}
Growth of Cloud Droplets in Warm Clouds (WH 4.4) {6.4}
Microphysics of Cold Clouds (WH 4.5) {6.5}
Artificial Modification of Clouds and Precipitation (WH5.6) {6.6}
Thunderstorms (WH 4.6) {6.7}
Spectrum of Radiation (WH6.1) {4.1}
Absorption and Emission of Radiation by Molecules (WH6.2) {4.4.3}
Quantitative Description of Radiation (WH6.3) {4.2}
Blackbody Radiation (WH 6.4) {4.3.1 – 4.3.3}
Absorptivity and Emissivity (WH 6.5) {4.3.4 – 4.3.6}
Atmospheric Absorption of Solar Radiation (WH 6.6) {4.5.1}
Atmospheric Abs. and Emission of IR Radiation (WH 6.7) {4.5.3 – 4.5.5}
Scattering of Solar Radiation (WH 6.8) {4.4.1}

Grading

Homework	10%
Exam I	20%
Exam II	20%
Exam III	20%
Final Exam	25%
Demonstration	5%
Total	**100%**

$92\% < \text{total score} \leq 100\%$	A
$90\% < \text{total score} \leq 92\%$	A-
$88\% < \text{total score} \leq 90\%$	B+
$82\% < \text{total score} \leq 88\%$	B
$80\% < \text{total score} \leq 82\%$	B-
$78\% < \text{total score} \leq 80\%$	C+
$72\% < \text{total score} \leq 78\%$	C
$70\% < \text{total score} \leq 72\%$	C-
$68\% < \text{total score} \leq 70\%$	D+
$60\% < \text{total score} \leq 68\%$	D
$\text{total score} \leq 60\%$	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.

Demonstration

Each student will be part of an education team responsible for finding a demonstration related to cloud formation or to radiation/optics. The demonstration should be aimed toward an Introduction to Meteorology (ATMS103) audience who doesn't have a lot of background in meteorology. The subject matter of the demonstration must meet the approval of the instructor by 19 March 2007. The education teams will be assigned before the mid-point of the semester. A two page written report must accompany the presentation that specifies the science behind the concept being taught, the required supplies, and any references used in assembling the demonstration.

Assignment/Quiz/Exam Policy

Assignments are to be handed in before the start of lecture 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 unexcused absences 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

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Textbook

"Atmospheric Science an Introductory Survey" by John M. Wallace and Peter V. Hobbs (First or Second Edition- Spring 2007 ONLY)

References

"Physical Meteorology" by Henry G. Houghton
"A First Course in Atmospheric Radiation" by Grant W. Petty

Disabilities

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

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 http://www.unca.edu/catalog/academicregs.html under "Student Responsibilities" for a refresher on the UNCA policy.