

Class Schedule - Fall 2009

Atmospheric Sciences

100 **Introduction to Meteorology** credit: 3 hours.

Introduces the student to the basic concepts and principles of meteorology via the interpretation of weather maps and charts; uses current weather information to illustrate key concepts, emphasizes the physical atmospheric processes responsible for weather. By the end of the class students will be able to interpret and make basic weather forecasts as well as be able to explain basic atmospheric phenomena.

This course satisfies the General Education Criteria for a Physical Sciences, and Quant Reasoning II course.

Students must register for one discussion and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
37008	discussion-recitation	ADA	09:00 AM - 09:50 AM	R	room G8A Foreign Languages Bldg	Dooley, A; Gesicki, P
Physical Sciences, and Quant Reasoning II course.						
37010	discussion-recitation	ADB	10:00 AM - 10:50 AM	R	room G8A Foreign Languages Bldg	Dooley, A; Gesicki, P
Physical Sciences, and Quant Reasoning II course.						
37013	discussion-recitation	ADC	11:00 AM - 11:50 AM	R	room G8A Foreign Languages Bldg	Dooley, A; Gleicher, K
Physical Sciences, and Quant Reasoning II course.						
37018	discussion-recitation	ADD	12:00 PM - 12:50 PM	R	room G8A Foreign Languages Bldg	Dooley, A; Gleicher, K
Physical Sciences, and Quant Reasoning II course.						
37086	discussion-recitation	ADE	01:00 PM - 01:50 PM	R	room G8A Foreign Languages Bldg	Dooley, A; Gleicher, K
Physical Sciences, and Quant Reasoning II course.						
49382	discussion-recitation	ADF	02:00 PM - 02:50 PM	R	room G8A Foreign Languages Bldg	Dooley, A; Norris, B
Physical Sciences, and Quant Reasoning II course.						
49383	discussion-recitation	ADG	03:00 PM - 03:50 PM	R	room G8A Foreign Languages Bldg	Dooley, A; Wegman, J

Physical Sciences, and Quant Reasoning II course.						
49384	discussion-recitation	ADH	04:00 PM - 04:50 PM	R	room G8A Foreign Languages Bldg	Dooley, A; Wegman, J
Physical Sciences, and Quant Reasoning II course.						
49385	discussion-recitation	ADI	08:00 AM - 08:50 AM	F	room G8A Foreign Languages Bldg	Dooley, A; Wegman, J
Physical Sciences, and Quant Reasoning II course.						
37089	discussion-recitation	ADJ	09:00 AM - 09:50 AM	F	room G8A Foreign Languages Bldg	Dooley, A; Gesicki, P
Physical Sciences, and Quant Reasoning II course.						
37090	discussion-recitation	ADK	10:00 AM - 10:50 AM	F	room G8A Foreign Languages Bldg	Bard, L; Dooley, A
Physical Sciences, and Quant Reasoning II course.						
37092	discussion-recitation	ADL	11:00 AM - 11:50 AM	F	room G8A Foreign Languages Bldg	Bard, L; Dooley, A
Physical Sciences, and Quant Reasoning II course.						
37095	discussion-recitation	ADM	12:00 PM - 12:50 PM	F	room G8A Foreign Languages Bldg	Bard, L; Dooley, A
Physical Sciences, and Quant Reasoning II course.						
37097	discussion-recitation	ADN	01:00 PM - 01:50 PM	F	room G8A Foreign Languages Bldg	Dooley, A; Norris, B
Physical Sciences, and Quant Reasoning II course.						
49386	discussion-recitation	ADO	02:00 PM - 02:50 PM	F	room G8A Foreign Languages Bldg	Dooley, A; Norris, B
Physical Sciences, and Quant Reasoning II course.						
37004	lecture	AL1	10:00 AM - 10:50 AM	MW	room 116 Roger Adams Laboratory	Dooley, A
Physical Sciences, and Quant Reasoning II course.						

37006	lecture	AL2	12:00 PM - 12:50 PM	MW	room 103 Mumford Hall	Dooley, A
Physical Sciences, and Quant Reasoning II course.						

120 **Severe and Hazardous Weather** credit: 3 hours.

Most extreme manifestations of weather and climate are analyzed in terms of their physical basis and their historical, economic and human consequences. Emphasis is placed on the interplay between technological advances, the evolution of meteorology as a science, and the impacts of extreme weather (winter storms, floods, severe thunderstorms, hurricanes, El Nino). Technological advances include satellites, weather radars and profilers, and computer models used for weather prediction. Same as ESES 120.

This course satisfies the General Education Criteria for a Physical Sciences course.

CRN	Type	Section	Time	Days	Location	Instructor
31290	lecture	A	09:30 AM - 10:50 AM	TR	room 150 Animal Sciences Laboratory	Walsh, J
31291	lecture	B	11:00 AM - 12:20 PM	TR	room 100 Gregory Hall	Snodgrass, E
31292	lecture	C	12:30 PM - 01:50 PM	TR	room 103 Mumford Hall	Snodgrass, E
41130	lecture	D	02:00 PM - 03:15 PM	TR	room 103 Mumford Hall	Dooley, A
55328	lecture	E	04:00 PM - 06:50 PM	TR	room 160 English Bldg	Snodgrass, E

Physical Sciences course. Meets 19-Oct-09 - 09-Dec-09.

52342	discussion-recitation	HA	ARRANGED			
	lecture	HA	09:30 AM - 10:50 AM	TR	room 150 Animal Sciences Laboratory	Snodgrass, E

Physical Sciences course. Section 52342. This discussion section is for James Scholars students only. If you have any questions about the project, the time commitment or anything else, please email the instructor, Eric Snodgrass (snodgrss@atmos.uiuc.edu).

52474	discussion-recitation	HB	ARRANGED			Snodgrass, E
	lecture	HB	11:00 AM - 12:20 PM	TR	room 100 Gregory Hall	Snodgrass, E

Physical Sciences course. Section 52474. This discussion section is for James Scholars students only. Once the semester begins we will meet once every other week to have an open discussion of the many severe weather topics you will learn about in class and work together on the James Scholars Project for Fall 2008. The time of these biweekly meetings is to be determined once the semester begins. If you have any

questions about the project, the time commitment or anything else, please email the instructor, Eric Snodgrass (snodgrss@atmos.uiuc.edu).

52475	discussion-recitation	HC	ARRANGED			Snodgrass, E
	lecture	HC	12:30 PM - 01:50 PM	TR	room 103 Mumford Hall	Snodgrass, E

Physical Sciences course. Section 52475. This discussion section is for James Scholars students only. If you have any questions about the project, the time commitment or anything else, please email the instructor, Eric Snodgrass (snodgrss@atmos.uiuc.edu).

201 **General Meteorology** credit: 3 hours.

Introduction to physical processes in the atmosphere, focusing on those relevant to weather and storms. Emphasizes quantitative problem solving. Topics include atmospheric structure, atmospheric thermodynamics, clouds, synoptic meteorology, weather forecasting, and storms. For students in atmospheric sciences, physics, mathematics, engineering, and other physical and natural sciences. Prerequisite: MATH 220 or MATH 221; credit or concurrent registration in MATH 231 and PHYS 211.

CRN	Type	Section	Time	Days	Location	Instructor
54034	lecture-discussion	A	02:00 PM - 03:20 PM	TR	room 136 Armory	Snodgrass, E

301 **Atmospheric Thermodynamics** credit: 3 hours.

Introduction to fundamental thermodynamic processes that occur in Earth's atmosphere. Defines, describes, and derives various thermodynamic concepts including (1) the conservation of energy, (2) laws of thermodynamics, (3) kinetic theory, (4) phase transitions of water, and (5) thermodynamic processes of the atmosphere. Applies thermodynamic concepts to atmospheric structure and stability, water phase transformations, and energy and mass transport within the atmosphere. Prerequisite: MATH 241 and PHYS 213.

CRN	Type	Section	Time	Days	Location	Instructor
49526	lecture-discussion		09:00 AM - 09:50 AM	MWF	room 109 Atmospheric Sciences Bldg	Riemer, N

302 **Atmospheric Dynamics I** credit: 3 hours.

Introduction to fundamental dynamical processes in the atmosphere through a descriptive and quantitative analysis of dynamical meteorology at the synoptic and global scale. Covers basic laws of fluid mechanics as applied to the atmospheric sciences, vorticity and circulation in 2-D and 3-D flows, boundary layer dynamics and friction, basic concepts of geophysical waves, and baroclinic instability. These topics will be covered both descriptively and mathematically with emphasis on computer representation of the fundamental processes governing atmospheric motion and application of theory to real-world examples. Same as PHYS 329. Prerequisite: ATMS 201, MATH 241 and PHYS 213; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
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49527	lecture		02:00 PM - 03:20 PM	TR	room 109 Atmospheric Sciences Bldg	Baidya Roy, S
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303 **Weather Analysis** credit: 4 hours.

Conceptualizes the structure and dynamics of the atmosphere through interpretation and analysis of weather charts, time and cross sections, soundings, and forecast products. Students develop case studies of weather system structure, and participate in discussions of weather processes as depicted by weather maps. Depiction of atmospheric kinematic and dynamic processes on weather charts is emphasized. Students learn conceptual models of the structure of mid-latitude cyclones and convective weather systems, including cyclogenesis, frontogenesis, the process of storm intensification, occlusion and frontolysis. Prerequisite: ATMS 201 and credit or concurrent registration in MATH 241.

CRN	Type	Section	Time	Days	Location	Instructor
49528	lecture		11:00 AM - 11:50 AM	MWF	room G13 Foreign Languages Bldg	Rauber, R

405 **Boundary Layer Processes** credit: 4 hours.

Course will qualitatively and quantitatively describe atmospheric boundary layer characteristics and processes. The course will focus on the turbulent structure of the boundary layer and the factors that influence this structure over a variety of surfaces (e.g., soil, vegetation, marine) and under a variety of atmospheric conditions (e.g., stability, diurnal/nocturnal). This atmospheric layer is important to our daily lives because it is where humans live and it connects the small-scale fluxes of energy and mass to the large-scale atmospheric circulation. Prerequisite: ATMS 301, ATMS 302, and ATMS 304; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
49413	lecture		08:00 AM - 09:20 AM	TR	room 100 Atmospheric Sciences Bldg	Kristovich, D

406 **Tropical Meteorology** credit: 4 hours.

Covers the mesoscale, synoptic scale and planetary scale motions in the tropical circulation. Emphasis will be on delineating the unique characteristics of tropical dynamics. Topics include Hadley circulation, Walter circulation, Julian-Madden oscillation, monsoons, easterly waves, equatorial waves, hurricanes, the quasi-biennial oscillation, El Nino and the Southern Oscillation. Prerequisite: ATMS 301 and ATMS 302, or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
49531	lecture		12:30 PM - 01:50 PM	TR	room 109 Atmospheric Sciences Bldg	Nesbitt, S

421 **Earth Systems Modeling** credit: 4 hours.

Introduction to systems modeling with applications to the earth and environmental sciences. Basic systems concepts and systems thinking in the contexts of hydrological, climatic, geochemical, and other environmentally

relevant systems. Students identify key processes and relationships in systems, represent these elements quantitatively in models, test the models, use them to predict system behavior, and assess the validity of the predictions. No special mathematical or computing background is required. Same as ESES 421, GEOG 421, GEOL 481, and NRES 422. Prerequisite: Junior, senior, or graduate standing in a natural science, geography, natural resources and environmental studies, or engineering.

CRN	Type	Section	Time	Days	Location	Instructor
37116	lecture-discussion	A	05:00 PM - 07:50 PM	W	room 22 ACES Lib, Info and Alum Ctr	Hurst, S; Hannon, B; Gertner, G

448 **Climate and Climate Change** credit: 4 hours.

Course provides an understanding of contemporary climate issues. This is to be accomplished by a systematic examination of: (1) the Earth's climate system, (2) the instrumental, historical and geological observations of the present and past climates of the Earth, (3) the theories of the causes of past, present and potential future climates, (4) the development of mathematical climate models to quantitatively simulate and understand climate and climate change; and (5) the results of such climate model simulations. Prerequisite: ATMS 301, ATMS 302, and ATMS 304; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
49501	lecture		02:00 PM - 02:50 PM	MWF	room 109 Atmospheric Sciences Bldg	Schlesinger, M

449 **Biogeochemical Cycles** credit: 4 hours.

Presents the key physical, biological, and chemical concepts of biogeochemical cycles central to understanding the causes of global changes in climate and air quality, focusing on an atmospheric sciences view of these cycles and their influences. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
49492	lecture-discussion	A	11:00 AM - 12:20 PM	TR	room 100 Atmospheric Sciences Bldg	Jain, A

490 **Individual Study** credit: 1 to 4 hours.

Individual study or reading at an advanced undergraduate level in a subject not covered in normal course offerings. May be repeated to a maximum of 8 hours. May not be used to satisfy requirements for an M.S. or Ph.D. degree in Atmospheric Sciences. Prerequisite: Consent of advisor and of staff member supervising work.

CRN	Type	Section	Time	Days	Location	Instructor
10391	independent study		ARRANGED			

Instructor Approval Required

492 **Capstone Undergrad Research** credit: 4 hours.

All senior Atmospheric Sciences undergraduate majors are expected to take a Capstone Undergraduate Research experience. Students will either be engaged in an atmospheric science research project or will participate in an approved internship program with an agency involved in atmospheric science research or in meteorological operations. A research or internship project will be with a program at UIUC or with an allied organization. The student will need to first gain approval for their research or internship. No graduate credit. May be repeated to a maximum of 8 undergraduate hours. Prerequisite: Senior standing in Atmospheric Sciences.

CRN	Type	Section	Time	Days	Location	Instructor
50871	conference	A	ARRANGED			Rauber, R

500 **Synoptic-Dynamic Meteorology** credit: 4 hours.

Examines the observed behavior of the atmosphere through the application of physical and hydrodynamical principles to analyses of real meteorological data; develops concepts for studying atmospheric circulations, particularly extratropical cyclones and anticyclones. Laboratory work includes the development of diagnostic techniques suitable for a better understanding of the current weather.

CRN	Type	Section	Time	Days	Location	Instructor
40175	lecture-discussion	A	11:00 AM - 12:20 PM	TR	room 109 Atmospheric Sciences Bldg	Rauber, R

502 **Numerical Fluid Dynamics** credit: 4 hours.

Addresses numerical techniques for solving linear and nonlinear differential equations in initial value fluid flow problems. Students receive a thorough background in the principles used to evaluate numerical methods, the ability to critically interpret these methods as presented in the literature, and in particular, the practical application of these techniques in modeling multi-dimensional flow on high-performance computers. Temporal and directional splitting, finite differencing/volume methods, and adaptive nesting will be discussed. Same as CS 505 and CSE 566. Prerequisite: MATH 241 or MATH 380 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
37123	lecture-discussion	A	09:30 AM - 10:50 AM	TR	room 109 Atmospheric Sciences Bldg	Jewett, B

504 **Physical Meteorology** credit: 4 hours.

Examines the physical processes that occur in the atmosphere. Topics include atmospheric thermodynamics, cloud physics and atmospheric radiation.

CRN	Type	Section	Time	Days	Location	Instructor
49578	lecture-discussion	A	11:00 AM - 11:50 AM	MWF	room 109 Atmospheric Sciences Bldg	McFarquhar, G

511 **Atmospheric Radiation** credit: 4 hours.

Physical concepts and various methods of analysis of radiation scattering by atmospheric molecules, particulates, and clouds; infrared radiative transfer in a stratified inhomogeneous atmosphere; radiation and ozone photochemistry in the stratosphere; and remote temperature and composition sensing techniques using satellite radiation data. Prerequisite: ATMS 504 or consent of the instructor.

CRN	Type	Section	Time	Days	Location	Instructor
43237	lecture-discussion		10:00 AM - 10:50 AM	MWF	room 109 Atmospheric Sciences Bldg	Di Girolamo, L

535 **Aerosol Sampling and Analysis** credit: 4 hours.

Same as CEE 545, ENVS 545, and ME 516. See CEE 545.

CRN	Type	Section	Time	Days	Location	Instructor
36028	laboratory-discussion	TW	03:00 PM - 04:50 PM	TR	room B222 Newmark Civil Engineering Bldg	Bond, T

571 **Professional Development** credit: 1 hours.

Aimed at professional development in the atmospheric sciences so that students recognize the importance of breadth of knowledge, effective oral and written scientific communication, and other skills they will need as professionals. Approved for S/U grading only. May be repeated to a maximum of 2 hours. Prerequisite: Graduate student in Atmospheric Sciences or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
30247	lecture	A	03:00 PM - 03:50 PM	M	room 100 Atmospheric Sciences Bldg	McFarquhar, G

590 **Individual Study** credit: 2 to 8 hours.

Individual study or reading in a subject not covered in normal course offerings. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
10393	independent study		ARRANGED			
Instructor Approval Required						

591 **Atmospheric Sciences Seminar** credit: 0 hours.

Seminar on topics of current interest. Approved for S/U grading only. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
30252	conference	A	03:30 PM - 04:20 PM	W	room 114 Transportation Bldg	Riemer, N

596 **Non-Thesis Research** credit: 4 hours.

Non-thesis research in the Atmospheric Sciences. Approved for S/U grading only. Restricted to students in the non-thesis option.

CRN	Type	Section	Time	Days	Location	Instructor
46240	conference	RMR	ARRANGED			Rauber, R

599 **Thesis Research** credit: 0 to 16 hours.

Section A: For master's degree candidates; Section B: For doctoral degree candidates. Approved for S/U grading only. Prerequisite: Consent of instructor.

This course is for students seeking Master's and Doctoral degrees.

CRN	Type	Section	Time	Days	Location	Instructor
10394	independent study		ARRANGED			
Instructor Approval Required						