

# Course Schedule - Fall 2007

## 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
37010	discussion-recitation	AD2	10:00 AM - 10:50 AM	F	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Hertel, A
37010: Physical Sciences, and Quant Reasoning II course.						
37013	discussion-recitation	AD3	12:00 PM - 12:50 PM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Pitcel, M
37013: Physical Sciences, and Quant Reasoning II course.						
37018	discussion-recitation	AD4	01:00 PM - 01:50 PM	F	room G8A Foreign Languages Bldg	VanLoocke, A
37018: Physical Sciences, and Quant Reasoning II course.						
37086	discussion-recitation	AD5	08:00 AM - 08:50 AM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Wisdom, A
37086: Physical Sciences, and Quant Reasoning II course.						
49382	discussion-recitation	AD6	11:00 AM - 11:50 AM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Pitcel, M
49382: Physical Sciences, and Quant Reasoning II course.						
49383	discussion-recitation	AD7	10:00 AM - 10:50 AM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Wisdom, A
49383: Physical Sciences, and Quant Reasoning II course.						
49384	discussion-recitation	AD8	02:00 PM - 02:50 PM	F	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; VanLoocke, A
49384: Physical Sciences, and Quant Reasoning II course.						
37004	lecture	AL1	09:00 AM - 09:50	MW	room 141	Charlevoix-Romine,

			AM		Wohlers Hall	D
37004: Physical Sciences, and Quant Reasoning II course.						
37089	discussion-recitation	BD1	11:00 AM - 11:50 AM	F	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Hertel, A
37089: Physical Sciences, and Quant Reasoning II course.						
37090	discussion-recitation	BD2	12:00 PM - 12:50 PM	F	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; VanLoocke, A
37090: Physical Sciences, and Quant Reasoning II course.						
37092	discussion-recitation	BD3	01:00 PM - 01:50 PM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Pitcel, M
37092: Physical Sciences, and Quant Reasoning II course.						
37095	discussion-recitation	BD4	02:00 PM - 02:50 PM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Workoff, T
37095: Physical Sciences, and Quant Reasoning II course.						
37097	discussion-recitation	BD5	03:00 PM - 03:50 PM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Workoff, T
37097: Physical Sciences, and Quant Reasoning II course.						
49386	discussion-recitation	BD6	04:00 PM - 04:50 PM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Workoff, T
49386: Physical Sciences, and Quant Reasoning II course.						
49389	discussion-recitation	BD9	09:00 AM - 09:50 AM	R	room G8A Foreign Languages Bldg	Charlevoix-Romine, D; Wisdom, A
49389: Physical Sciences, and Quant Reasoning II course.						
37006	lecture	BL1	12:00 PM - 12:50 PM	MW	room 141 Wohlers Hall	Charlevoix-Romine, D
37006: 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.

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

CRN	Type	Section	Time	Days	Location	Instructor
31290	lecture	A	09:00 AM - 10:15 AM	TR	room 112 Chemistry Annex	Snodgrass, E
31290: Physical Sciences course.						
31291	lecture	B	10:30 AM - 11:45 AM	TR	room 1320 Digital Computer Laboratory	Snodgrass, E
31291: Physical Sciences course.						
31292	lecture	C	12:00 PM - 01:15 PM	TR	room 112 Chemistry Annex	Walsh, J
31292: Physical Sciences course.						
41130	lecture	D	02:00 PM - 03:15 PM	TR	room 100 Materials Science and Eng Bld	Snodgrass, E
41130: Physical Sciences course.						

**202 Soc Impacts Weather & Climate** credit: 3 hours.

The study of how weather and climate phenomena have changed the shape of the United States, particularly with regard to traditionally underrepresented populations. Examines the complex relationship between weather and climate and society from both a physical and social perspective. Discussions will be focused around the physical principles driving the weather and climate and how they interact with all aspects of society.

This course satisfies the General Education Criteria for a UIUC Social Sciences course.

CRN	Type	Section	Time	Days	Location	Instructor
49493	lecture- discussion	A	01:00 PM - 01:50 PM	MWF	room 333 Armory	Charlevoix-Romine, D
49493: Camp Honors/Chanc Schol, and UIUC Social Sciences course.						
49493: For Chancellor's Scholars. Others may enroll with consent of the instructor and the Campus Honors Program						

**300 Weather Processes** credit: 3 hours.

Introduction to the mean state of the atmosphere, the fundamental physics of weather processes, and the mechanisms producing daily weather changes, both qualitative and quantitative in nature. Prerequisite: MATH 241 (formerly MATH 243) or MATH 242; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
30260	lecture- discussion	1	01:00 PM - 01:50 PM	MWF	room 109 Atmospheric Sciences Bldg	Snyder, P

403 **Weather Forecasting** credit: 4 hours.

Examines the tools and techniques of weather forecasting, with heavy emphasis on actual forecasting. Numerical models used to forecast weather are reviewed and compared. Forecasting using numerical, statistical and probabilistic forecasting techniques are studied. Forecasts of significant winter weather, convection, floods and other weather hazards are emphasized. Students learn the process behind Severe Weather Watches and Warnings, Quantitative Precipitation Forecasts, precipitation Type forecasts, Flood forecasts and forecasts of other significant weather. Prerequisite: ATMS 302, ATMS 303 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
49414	lecture-discussion		12:30 PM - 02:50 PM	TR	room 109 Atmospheric Sciences Bldg	Nesbitt, S

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 304, or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
49413	lecture		09:00 AM - 10:15 AM	TR	room 109 Atmospheric Sciences Bldg	Twine, T

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 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

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			
10391: Instructor Approval Required						

491 **Topics in Atmospheric Sciences** credit: 2 to 4 hours.

Special topics in atmospheric sciences at an advanced undergraduate level. May be repeated as topic varies to a maximum of 12 hours per term. Prerequisite: Advanced undergraduate standing and consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
49496	lecture-discussion	N	10:30 AM - 11:45 AM	TR	room 100 Atmospheric Sciences Bldg	Baidya Roy, S
49496: 4 hours Computing and Data Analysis						
49841	lecture-discussion	O	09:00 AM - 09:50 AM	MWF	room 109 Atmospheric Sciences Bldg	Di Girolamo, L
49841: 4 hours Atmospheric Radiation						

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. 4 undergraduate hours. 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

501 **Mesoscale Meteorology** credit: 4 hours.

Basic concepts and ideas on atmospheric processes that occur on scales of motions from a few kilometers to a few hundred kilometers, a scale loosely classified by meteorologists as "mesoscale". After an introductory discussion of mesoscale classifications and attendant forecast problems, the course will introduce various mesoscale phenomena, internally generated circulations, externally forced circulations, and mesoscale instabilities. Covers all three fundamental aspects of mesoscale meteorology: observations, theory and modeling, with particular emphasis on the dynamics of precipitating mesoscale systems. Prerequisite: ATMS 401 and ATMS 402.

CRN	Type	Section	Time	Days	Location	Instructor
30266	lecture-discussion	1	11:00 AM - 11:50 AM	MWF	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 (formerly MATH 243) or MATH 380; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
37123	lecture-discussion	A	03:00 PM - 04:15 PM	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. Students may not receive credit for both ATMS 504 and ATMS 407.

CRN	Type	Section	Time	Days	Location	Instructor
49536	lecture		10:00 AM - 10:50 AM	MWF	room 109 Atmospheric Sciences Bldg	McFarquhar, G

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 breath 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 - 04:15 PM	M	room 109 Atmospheric Sciences Bldg	Rauber, R

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			
10393: Instructor Approval Required						

591 **Atmospheric Sciences Seminar** credit: 0 to 4 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 144 Loomis Laboratory	Nesbitt, S

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			
10394: Instructor Approval Required						