

PROPOSAL TO THE SENATE COMMITTEE ON EDUCATIONAL POLICY

TITLE: Creation of an Undergraduate Major in the Sciences and Letters Curriculum in Atmospheric Sciences, College of Liberal Arts and Sciences

SPONSORS:

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COLLEGE SPONSOR:

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BRIEF DESCRIPTION:

The Department of Atmospheric Sciences proposes an undergraduate degree program in the atmospheric sciences. The proposed major will provide students with a thorough understanding of the processes responsible for weather, climate, and human influences on the atmosphere. This understanding will be built on a foundation in the basic sciences acquired in prerequisite courses and reinforced throughout our curriculum of major courses. Our students will acquire computational, analytical, and communications skills in our courses that will be sharpened through frequent application to the atmosphere.

The major in Atmospheric Sciences would include:

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|---|------------|------------|
| 1) <i>Physics, math, and chemistry courses required for the major</i> | 8 courses | (25 hours) |
| 2) <i>Required 200-400 level Atmos. Sci. courses and ATMS 492 (Capstone research)</i> | 10 courses | (32 hours) |

As a capstone experience, our students will engage in undergraduate research or will participate in a professional internship. In so doing they will draw on the great diversity of faculty research in the Department of Atmospheric Sciences and on our connections to the Illinois State Water Survey, the National Weather Service, the Illinois Environmental Protection Agency, NCSA, and WILL, among others.

JUSTIFICATION:

The proposed major will be the only undergraduate program in atmospheric sciences or meteorology at a major research university in the State of Illinois. It is designed to be consistent with the requirements of a Liberal Arts and Sciences major rather than meet a specialized curriculum. It will attract Illinois students who are currently drawn to the flourishing

undergraduate degree programs at the University of Michigan, the University of Wisconsin, Purdue University, and at other out-of-state peer institutions. Presently, the Individual Plans of Study (IPS) program provides the only means for university undergraduates to major in the atmospheric sciences. The interest of students in IPS has recently increased dramatically, and we are frequently contacted by high school students, supporting the need for a formal major program at the University.

The proposed major will prepare students for graduate study in the atmospheric and related sciences and for careers in operational meteorology, environmental consulting, climate analysis and forecasting, or computer applications in the atmospheric sciences.. More generally, the strong quantitative and reasoning skills developed in our undergraduate major will also make the student adaptable to a range of career opportunities outside of Atmospheric Sciences. In the United States, there are more than 240 private-sector Internet providers of weather analyses and forecasting, and countless more employers hire atmospheric scientists for work related to weather, climate, and the atmospheric environment. Moreover, because a broad theme of our field is environmental prediction, our graduates will not only be prepared to work in the atmospheric sciences, but also in other areas, such as hydrology, epidemiology, ecology, and geophysics.

Atmospheric Sciences faculty conduct cutting edge, externally funded research in nearly all areas of the atmospheric sciences, including atmospheric composition, climate, air pollution, the hydrologic and biogeochemical cycles and the weather. Building on this excellence in research and graduate education, our program, at its inception, will be the only large undergraduate atmospheric sciences program in Illinois, and should soon rank among the five best undergraduate programs in the nation.

BUDGETARY AND STAFF IMPLICATIONS:

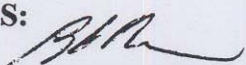
- a. The Department of Atmospheric Sciences receives adequate base state support to accommodate this major.
- b. No changes are expected in internal reallocations (e.g., change in class size, teaching loads, student-faculty ratio, etc.) except for new courses discussed later. Teaching loads for tenure-track faculty do not change and teaching can be done with existing faculty.
- c. There will be some impact on departments for which prerequisite courses will be required. These include math, physics, and chemistry. (see enclosed letters from other departments).
- d. The demands for computer classrooms are adequately met with the College of Liberal Arts and Sciences plans for expansion of these facilities.

GUIDELINES FOR UNDERGRADUATE EDUCATION:

The requirements for satisfying the major in Atmospheric Sciences are developed to satisfy all of the guidelines for undergraduate education at the University of Illinois. The course requirements for this undergraduate major are designed to develop the students intellectually in their ability to read and listen, to write and speak, to observe and respond critically, to think clearly, critically,

and creatively, to think quantitatively and qualitatively, and to develop understanding and attitudes appropriate to a graduate of this institution of higher learning. The curriculum in the Department of Atmospheric Sciences is aimed at achieving the breadth of understanding of atmospheric sciences appropriate to a wide range of career possibilities.

CLEARANCES:



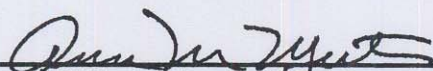
7/21/06

Department of Atmospheric Sciences

Date

School of Earth, Society and the Environment

Date



11/13/06

College of Liberal Arts and Sciences

Date

Office of the Provost

Date

Proposed effective date: Fall 2008.

STATEMENT FOR PROGRAMS OF STUDY CATALOG:

Atmospheric Sciences www.atmos.uiuc.edu

The Science and Letters Curriculum in Atmospheric Sciences prepares students for careers in a wide range of disciplines within the atmospheric sciences including meteorology, environmental science, climate, remote sensing, atmospheric chemistry, computational science and other areas. The curriculum is tailored to achieve the student's long term educational goals, their career aspirations in atmospheric sciences, and their general interests in the field. All students receive a firm foundation in mathematics, physics and chemistry, and develop data analysis and computational skills that can be used in a wide range of applications within and beyond the atmospheric sciences. Students can emphasize specific areas of interest in their elective choices. Student's majoring in Atmospheric Sciences will have opportunities for employment within agencies of government (e.g. the National Weather Service/NOAA, NASA, EPA, DOD, DOE), many private firms, and in colleges and universities for those who continue with graduate education. All students take part in independent study, internship or research projects as a capstone experience in their senior year. Students interested in a research career in atmospheric sciences are encouraged to undertake research projects in the capstone experience.

The undergraduate curriculum in atmospheric sciences is modeled on the recently published recommendations of the American Meteorological Society. The American Meteorological Society is the professional society for atmospheric scientists and meteorologists in the United States. Their "recommended attributes" for undergraduate degree programs in the atmospheric sciences are guidelines for graduates to be successful in finding employment or in seeking admission to graduate programs. Therefore, we have closely adhered to these recommended attributes in designing our program.

Major in Sciences and Letters Curriculum

Email: dept@atmos.uiuc.edu

Degree Title: Bachelor of Science in Liberal Arts and Sciences

Minimum required major and supporting course work normally equates to 56-57 hours including at least 31 hours in Atmospheric Sciences.

General education: The LAS General Education requirements are set up so students automatically complete the Campus General Education requirements.

Minimum hours required for graduation: 120 hours

Departmental distinction. A student majoring in Atmospheric Sciences will earn distinction by attaining a minimum cumulative grade point average of 3.2, a minimum grade point average of 3.2 in all of their Atmospheric Sciences courses, and completing a senior thesis Capstone project. Distinction will be awarded at graduation to all students who meet these requirements.

Hours	Requirements
4	PHYS 211 Univ Physics, Mechanics
4	PHYS 212 Univ Physics, Elec& Mag
2	PHYS 213 Univ Physics, Thermal Physics
3	CHEM 102 General Chemistry I
1	CHEM 103 General Chemistry Lab I
4-5	Select one of: MATH 220- Calculus MATH 221- Calculus I
3	MATH 231 Calculus II
4	MATH 241 Calculus III
3	ATMS 201 General Meteorology
3	ATMS 301 Atmospheric Thermodynamics
3	ATMS 302 Atmospheric Dynamics I
4	ATMS 303 Weather Analysis
3	ATMS 304 Atmospheric Radiation
3	ATMS 305 Computing and Data Analysis
4	ATMS 403 Weather Forecasting
4	ATMS 404 Mesoscale Processes
4	ATMS 492 Capstone Undergrad Research
56-57	TOTAL HOURS

APPENDICES

- A. Projected Enrollment and integration with other campus majors
- B. Letters of support from other departments and programs at UIUC for formation of the undergraduate major in Atmospheric Sciences