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Program Overview

The atmospheric sciences (ATM) specialization is designed to provide a well-rounded background in meteorology and atmospheric sciences. By working with knowledgeable School of Mines faculty, students are able to pursue careers in the National Weather Service, U.S. Bureau of Reclamation, U.S. Geological Survey, and private industry, as well as prepare for continued education at the master's and doctoral levels.

Labs and Facilities

The School of Mines is home to the Institute of Atmospheric Sciences (IAS), whose mission is to study the physical, chemical, and biological processes that affect the Earth's atmosphere. The IAS has modern laboratory facilities that analyze and measure atmospheric components that have the potential to affect the balance of the earth system. It is also home to the Black Hills Advanced Visualization Laboratory, a modern scientific immersive and tracked visualization facility, and the Biogeochemistry Core Facility, a laboratory that analyzes key constituents of terrestrial and aquatic ecosystems.

Curriculum

Students take a broad range of courses in the natural and physical sciences including physics, chemistry, math and computer science, and, of course, meteorology and related earth sciences. The atmospheric sciences specialization allows students to prepare for careers in earth sciences, meteorology, computational studies, and scientific visualization of the earth system. Atmospheric Science students also participate in research and weather-related activities such as forecasting competitions and summer internships.

Curriculum Listing

Freshman Year

First Semester

CHEM 112	General Chemistry I	3
CHEM 112L	General Chemistry I Lab	1
ENGL 101	Composition I	3
IS 110	Explorations	2
MATH 123	Calculus I	4
Gen Ed Humanities/Social Science Elective		3
TOTAL		16

Second Semester

CHEM 114	General Chemistry II	3
CHEM 114L	General Chemistry II Lab	1
CSC 150/L	Computer Science I/Lab	3
MATH 125	Calculus II	4
PE	Physical Education	1
Gen Ed Humanities/Social Science Elective		3
TOTAL		15

Sophomore Year

First Semester

ATM 301	Intro to Atmospheric Science	3
ENGL 279	Technical Communications I	3
MATH 225	Calculus III	4
PE	Physical Education	1
PHYS 211	University Physics I	3
Gen Ed Humanities/Social Science Elective		3
TOTAL		17

Second Semester

ENGL 289	Technical Comm II	3
IS 201	Introduction to Science, Technology, and Society	3
MATH 321	Differential Equations	4
PHYS 213	University Physics II	3
PHYS 213L	University Physics II Lab	1
Gen Ed Humanities/Social Science Elective		3
TOTAL		17

Junior Year

First Semester

ATM 450/L	Synoptic Meteorology I/Lab	3
ATM 460	Atmospheric Dynamics I	3
BIOL 311	Principles of Ecology	3
ATM/SCI/MATH/ENG Elective		3
Upper Division HU/SS Elective		3
TOTAL		15

Second Semester

ATM 530	Radar Meteorology	3
ATM 555/L	Synoptic Meteorology II/Lab	3
ATM/SCI/MATH/ENG Electives		9
Upper Division HU/SS Elective		3
TOTAL		18

Senior Year

First Semester

ATM 401	Atmospheric Physics	3
IS 401	Writing and Research in the Interdisciplinary Sciences	3
ATM/SCI/MATH/ENG Electives		6
Upper Division HU/SS Elective		3
TOTAL		15

Second Semester

ATM 404	Atmospheric Thermodynamics	3
ATM 406	Global Environmental Change	3
ATM/SCI/MATH/ENG Electives		3
IS 498	Undergrad Res/Scholarship	3
Upper Division HU/SS Elective		3
TOTAL		15

128 credits required for graduation

All IS specializations require a minimum of 30 semester hours of natural sciences, including a minimum of three semester hours in chemistry, three semester hours in biology, six semester hours in a science sequence, and 12 semester hours at the upper division. The atmospheric sciences/meteorology specialization requires one year of general chemistry with labs, one year of university physics with lab, and one semester of BIOL 311: Principles of Ecology. Students should consult with their advisors to determine additional science courses appropriate for their career paths.

All IS specializations require Math 123 or a math course requiring Math 123 as its prerequisite. Atmospheric sciences/meteorology requires CSC 150/150L and additional math course work beyond Math 123. Math 102 and Math 120 may be used toward graduation requirements.

Students should consult with their atmospheric sciences/interdisciplinary sciences advisors on the most appropriate ATM/science/math/engineering electives for their career paths.