B.S.M.A.S. IN METEOROLOGY

Meteorology

The Bachelor of Science degree program prepares students for further graduate studies as well as for non-academic professional applications. The program follows standards established by the American Meteorological Society (AMS), emphasizing a math and physics background for understanding the physical processes governing the motion and composition of the atmosphere.

Undergraduate students are encouraged to work with the faculty and are able to earn course credit and senior theses by conducting research under the supervision of leading scientists in their field. Research encompasses atmospheric dynamics, climate science, boundary-layer processes, cloud processes, and remote sensing. Focus areas include hurricanes (modeling, data assimilation and field observations), tropical meteorology, atmosphere-ocean coupling, climate, and climate change. Many faculty are active in fieldwork.

The Bachelor of Science degree program is meant for students planning to continue with graduate studies in atmospheric science, or for those who will pursue a technical career in this area in government or private industry.

Curriculum Requirements

Code	Title	Credit Hours
Atmospheric Science		
ATM 103	Survey of Modern Meteorology	3
ATM 243	Weather Forecasting	3
ATM 265	Atmospheric Chemistry	3
ATM 303	Meteorological Instrumentation and Observation	3
ATM 305	Atmospheric Thermodynamics	3
ATM 307	Introduction to the Physics of Climate	3
ATM 405	Atmospheric Dynamics I	3
ATM 406	Atmospheric Dynamics II	3
ATM 407	Weather Analysis	4
ATM 409	Cloud Physics, Radiation, and Remote Sensing	3
Other Required Courses		
CSC 120	Computer Programming I	4
or MSC 203	Foundations of Computational Marine Science	
ENG 105	English Composition I	3
ENG 107	English Composition II: Science and Technology	3
or ENG 106	English Composition II	
MSC 111	Introduction to Marine Science	3
MSC 112	Introduction to Marine Science Lab	1
MTH 161	Calculus I [1]	4
or MTH 171	Calculus I	
MTH 162	Calculus II [1]	4
or MTH 172	Calculus II	
MTH 210	Introduction to Linear Algebra	3
MTH 224	Introduction to Probability and Statistics	3
or MSC 204	Environmental Statistics	
MTH 311	Introduction to Ordinary Differential Equations	3
MTH 310	Multivariable Calculus	3
or MTH 211	Calculus III	
PHY 201	University Physics I for the Sciences	4
PHY 106	College Physics Laboratory I	1
PHY 202	University Physics II for the Sciences	4
PHY 108	College Physics Laboratory II	1
Electives		
Atmospheric Science, Mathematics, or Science Course		3
Arts and Humanities Cognate Courses		9

People and Society Cognate Courses		9
Additional Electives		24
Recommended courses include:		
ATM 244	Tropical Weather and Forecasting	
ATM 306	Advanced Principles in Broadcasting Meteorology	
MSC 301	Introduction to Physical Oceanography	
Total Credit Hours		**120**

[1]   Calculus I and II must be passed with a grade of "C" or higher.

*   500-level courses are open to undergraduates but typically offered on the RSMAS campus. For Broadcast Meteorology double-majors and minors, the electives may be taken from the School of Communications.

Suggested Plan of Study with Math Minor

Course	Title	Credit Hours
Freshman Year		
Fall		
ATM 103	Survey of Modern Meteorology	3
MSC 111	Introduction to Marine Science	3
MSC 112	Introduction to Marine Science Lab	1
ENG 105	English Composition I	3
MTH 161	Calculus I	4
Elective #1		3
	Credit Hours	**17**
Spring		
ATM 243	Weather Forecasting	3
ATM 265	Atmospheric Chemistry	3
ENG 107	English Composition II: Science and Technology	3
MTH 162	Calculus II	4
Elective #2		3
	Credit Hours	**16**
Sophomore Year		
Fall		
MTH 210	Introduction to Linear Algebra	3
PHY 201	University Physics I for the Sciences	4
PHY 106	College Physics Laboratory I	1
ATM/MTH/Science Course (ATM 244 is recommended)		3
Elective #3		3
	Credit Hours	**14**
Spring		
ATM 303	Meteorological Instrumentation and Observation	3
CSC 120 or MSC 203	Computer Programming I or Foundations of Computational Marine Science	4
PHY 202	University Physics II for the Sciences	4
PHY 108	College Physics Laboratory II	1
MSC 204 or MTH 224	Environmental Statistics or Introduction to Probability and Statistics	3
Elective #4		3
	Credit Hours	**18**
Junior Year		
Fall		
ATM 305	Atmospheric Thermodynamics	3
MTH 310	Multivariable Calculus	3
Elective #5		3

Elective #6		3
Elective #7		3
	Credit Hours	**15**
Spring		
ATM 307	Introduction to the Physics of Climate	3
ATM 405	Atmospheric Dynamics I	3
MTH 311	Introduction to Ordinary Differential Equations	3
Elective #8		3
Elective #9		3
	Credit Hours	**15**
Senior Year		
Fall		
ATM 406	Atmospheric Dynamics II	3
ATM 407	Weather Analysis	4
Elective #10		3
Elective #11		3
	Credit Hours	**13**
Spring		
ATM 409	Cloud Physics, Radiation, and Remote Sensing	3
Elective #12		3
Elective #13		3
Elective #14		3
	Credit Hours	**12**
	Total Credit Hours	**120**

*   14 elective courses include:
- 3 Arts and Humanities Cognate courses
- 3 People and Society Cognate courses

Mission

The mission of the Rosenstiel School of Marine and Atmospheric Science is to deepen our collective knowledge of our planet through cutting-edge scientific research on the oceans, atmosphere, geology, biota, and the human dimension, while training the next generation of scientists. We transfer the knowledge gained to our students, the national and international scientific community, and to policymakers and the public.

The educational mission of the BS degree in Meteorology at the University of Miami is to graduate students with the ability and desire to integrate knowledge of meteorology into their future careers.

Goals

This program strives to provide the rigor, flexibility, depth and integration to enable students to:

- Pursue a course of study that provides both depth and breadth in Meteorology and related science courses.
- Prepare themselves for public and private sector employment, graduate school, and successful careers.

Student Learning Outcomes

- Meteorology students will be able to apply concepts from physics to the atmosphere of a rotating planet, to solve basic problems.
- Students will be able to apply the basic concepts of thermodynamics to the atmosphere.
- Students will learn the structure and chemistry of the troposphere and stratosphere and apply this to air quality and environmental science applications.