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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ATM 103</td>
<td>Survey of Modern Meteorology</td>
<td>3</td>
</tr>
<tr>
<td>ATM 243</td>
<td>Weather Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>ATM 265</td>
<td>Atmospheric Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>ATM 303</td>
<td>Meteorological Instrumentation and Observation</td>
<td>3</td>
</tr>
<tr>
<td>ATM 305</td>
<td>Atmospheric Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>ATM 307</td>
<td>Introduction to the Physics of Climate</td>
<td>3</td>
</tr>
<tr>
<td>ATM 405</td>
<td>Atmospheric Dynamics I</td>
<td>3</td>
</tr>
<tr>
<td>ATM 406</td>
<td>Atmospheric Dynamics II</td>
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<td>ATM 407</td>
<td>Weather Analysis</td>
<td>4</td>
</tr>
<tr>
<td>ATM 409</td>
<td>Cloud Physics, Radiation, and Remote Sensing</td>
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Other Required Courses

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>CSC 120</td>
<td>Computer Programming I</td>
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<tr>
<td>or MSC 203</td>
<td>Foundations of Computational Marine Science</td>
<td>3</td>
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<tr>
<td>ENG 105</td>
<td>English Composition I</td>
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<tr>
<td>ENG 107</td>
<td>English Composition II: Science and Technology</td>
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<td>or ENG 106</td>
<td>English Composition II</td>
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<tr>
<td>MSC 111</td>
<td>Introduction to Marine Science</td>
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<tr>
<td>MSC 112</td>
<td>Introduction to Marine Science Lab</td>
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<tr>
<td>MTH 161</td>
<td>Calculus I</td>
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<tr>
<td>or MTH 171</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 162</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>or MTH 172</td>
<td>Calculus II</td>
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<tr>
<td>MTH 210</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
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<tr>
<td>MTH 224</td>
<td>Introduction to Probability and Statistics</td>
<td>3</td>
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<tr>
<td>or MSC 204</td>
<td>Environmental Statistics</td>
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<tr>
<td>MTH 311</td>
<td>Introduction to Ordinary Differential Equations</td>
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<td>MTH 310</td>
<td>Multivariable Calculus</td>
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<td>PHY 201</td>
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Electives

<table>
<thead>
<tr>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Atmospheric Science, Mathematics, or Science Course</td>
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</tr>
<tr>
<td>Arts and Humanities Cognate Courses</td>
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People and Society Cognate Courses

Additional Electives

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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td><strong>Freshman Year</strong></td>
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<tr>
<td><strong>Fall</strong></td>
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<tr>
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<td>ENG 105</td>
<td>English Composition I</td>
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<td>MTH 161</td>
<td>Calculus I</td>
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<td>Elective #1</td>
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<td><strong>Spring</strong></td>
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<tr>
<td>ATM 243</td>
<td>Weather Forecasting</td>
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<td>MTH 162</td>
<td>Calculus II</td>
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<td>PHY 106</td>
<td>College Physics Laboratory I</td>
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<td>ATM/MTH/Science Course (ATM 244 is recommended)</td>
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<td>Environmental Statistics or Introduction to Probability and Statistics</td>
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<td>ATM 305</td>
<td>Atmospheric Thermodynamics</td>
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<td>Multivariable Calculus</td>
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### Elective #6
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### Elective #7
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#### Spring
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>ATM 307</td>
<td>Introduction to the Physics of Climate</td>
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<tr>
<td>ATM 405</td>
<td>Atmospheric Dynamics I</td>
<td>3</td>
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<tr>
<td>MTH 311</td>
<td>Introduction to Ordinary Differential Equations</td>
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<td>Elective #8</td>
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**Credit Hours:** 15

### Elective #8
3
### Elective #9
3

#### Senior Year

#### Fall
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**Credit Hours:** 15

### Spring
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<tr>
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<tbody>
<tr>
<td>ATM 409</td>
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<td>Elective #12</td>
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<tr>
<td>Elective #13</td>
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</tr>
<tr>
<td>Elective #14</td>
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</tbody>
</table>

**Credit Hours:** 13

**Total Credit Hours:** 12

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**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.