Atmospheric and Oceanic Sciences, M.S.

The majority of our graduate students get an M.S. degree, which can be earned as part of the path toward a Ph.D. degree or earned as a terminal degree opening significant opportunities within the public and private sectors.

The department currently has 11 faculty members, approximately 60 graduate students, and many staff members involved in large and energetic research programs. Particular strengths include climate/earth system science, geophysical fluid dynamics, remote sensing, planetary boundary layer, atmospheric chemistry, weather systems and prediction, and oceanography. Course concentrations within the existing degree program are offered in the areas of weather prediction, earth system science, remote sensing, and oceanography.

The department has close ties with the Center for Climatic Research, the Nelson Institute for Environmental Studies, Center for Sustainability and the Global Environment, Space Science and Engineering Center, Cooperative Institute for Meteorological Satellite Studies, National Weather Service, and the State Climatologist Office.

Job opportunities have been strong within the United States for people with graduate degrees in atmospheric and oceanic sciences. The government hires a large number of meteorologists with advanced degrees, as do many private forecasting companies and air quality consulting firms. In addition, there are openings for experts at various government and university research labs.

Admissions

Admission Requirements

Graduate Record Exam (GRE)

The general test is required. This includes verbal, quantitative and analytical parts.

Admitted students generally have quantitative scores of at least 151 (650 prior scale, 56% percentile), verbal reasoning scores of 152 (490 prior scale, 56% percentile) and analytical scores of 4.0 (48% percentile). Scores should not be older than five years.

Prerequisites for Graduate Work

Math—three semesters college calculus sequence for science/engineering majors plus differential equations

Physics—two semesters calculus-based general college physics

Chemistry—one semester general chemistry

A minimum undergraduate GPA of 3.0 is required for admission. The Graduate School computes the GPA based on approximately the last 60 semester hours (two years) of undergraduate work.

International students must submit scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS).

Prior work in atmospheric or oceanic sciences is not required, but it is beneficial. Knowledge of computer programming is recommended.

Applications are also judged on academic record, letters of recommendation, prior research experience, and the statement of purpose.

Please see the ATM OCN website (http://aoswebsite.aos.wisc.edu/academics/graduate/admission) for additional information on admission requirements and the application process.

Please consult the table below for key information about this degree program’s admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program’s website.

Graduate admissions is a two-step process between academic programs and the Graduate School. Applicants must meet the minimum requirements of the Graduate School as well as the program(s).

Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/apply).

Funding

Graduate School Resources

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding) is available from the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

Requirements

Minimum Graduate School Requirements

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

Major Requirements

Mode of Instruction

<table>
<thead>
<tr>
<th>Mode of Instruction</th>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

Evening/Weekend: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.

Online: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules.

Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.
Hybrid: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

Accelerated: These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

**CURRICULAR REQUIREMENTS**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Detail</th>
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<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>M.S.–Thesis track: 30 credits</td>
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<tr>
<td></td>
<td>M.S.–Non-thesis track: 36 credits</td>
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<tr>
<td>Minimum Residence Credit Requirement</td>
<td>M.S.–Thesis track: 16 credits</td>
</tr>
<tr>
<td></td>
<td>M.S.–Non-thesis track: 19 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>M.S.–Thesis track: Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>).</td>
</tr>
<tr>
<td></td>
<td>M.S.–Non-thesis track: Half of degree coursework (18 credits out of 36 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>).</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required.</td>
</tr>
<tr>
<td>Other Requirements</td>
<td>M.S.–Thesis track: A grade of B or greater is required for the 12 credits of lecture courses in the department numbered 400 or above. See &quot;Courses Required&quot; below.</td>
</tr>
<tr>
<td></td>
<td>The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.</td>
</tr>
<tr>
<td>Assessments and Examinations</td>
<td>M.S.–Thesis track: A master’s thesis is required, and must be approved by the major professor and two additional faculty members. A public oral presentation of the thesis is required.</td>
</tr>
<tr>
<td></td>
<td>M.S.–Non-thesis track: A paper demonstrating technical writing skill is required. The student can write this paper by working individually with a professor in a directed research setting, or as part of a seminar class. The professor in charge of the directed study or seminar course indicates acceptance of the paper as evidence of technical writing skill by signing the paper.</td>
</tr>
<tr>
<td>Language Requirements</td>
<td>No language requirements.</td>
</tr>
</tbody>
</table>

1 These tracks are internal to the program and represent different pathways a student can follow to earn this degree. Track names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

**REQUIRED COURSES**

For both the thesis and non-thesis tracks\(^1\) there is a set of six core courses which are highly recommended as a good foundation for graduate degrees in the Department of Atmospheric and Oceanic Sciences. A GPA of 3.0 must be maintained for both options.

The following is a listing of the core courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATM OCN 610</td>
<td>Geophysical Fluid Dynamics I</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN 611</td>
<td>Geophysical Fluid Dynamics II</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN 630</td>
<td>Introduction to Atmospheric and Oceanic Physics</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN 640</td>
<td>Radiation in the Atmosphere and Ocean</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN 650</td>
<td>Analysis of Atmospheric Systems</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN 660</td>
<td>Introduction to Physical Oceanography</td>
<td>3</td>
</tr>
</tbody>
</table>

In consultation with their advisor, every student seeking a M.S. degree, will design a curriculum that must be approved by their advisor.

**M.S.–Thesis track\(^1\):**

- 12 of the credits must be taken in the department as lecture courses numbered 400 or above. Seminars, research, independent study or directed reading courses do not satisfy this requirement. A grade of B or greater is required for these 12 credits.
- An additional 12 (at least) credits may be taken in or out of the department. These credits can include seminars, core courses, and other courses taken as a graduate student. Research credits do not count toward this requirement.
- Up to 6 research credits in the department can be counted (but are not required) toward the 30 credit requirement.

**M.S.–Non-thesis track\(^1\):**

- At least 18 credits must be from courses numbered 400 or above in the department. Seminars, research, independent study or directed reading courses do not satisfy this requirement.
- An additional 6 (at least) credits must be from courses outside of the department. Seminars and research credits do not satisfy this requirement.
- A total of 30 credits must be taken from nonseminar courses. Research credits do not contribute to this requirement.
- Up to 6 credits can be from seminar courses in any department, from research in the atmospheric and oceanic sciences department only if approved by the student’s advisor, or from independent study or directed reading in any department. Up to 2 of these 6 credits may be awarded for prior professional experience, or by an internship conducted as part of the M.S. program.

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POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

GRADUATE PROGRAM HANDBOOK

The Graduate Program Handbook (http://aoswebsite.aos.wisc.edu/academics/graduate/handbook) is the repository for all of the program's policies and requirements.

Prior Coursework

Graduate Work from Other Institutions

M.S.–Thesis track\(^1\): With program approval, students are allowed to count no more than 14 credits of graduate coursework from other institutions. Coursework earned five or more years prior to admission to a master's degree or earned ten years or more prior to admission to a doctoral degree is not allowed to satisfy requirements.

M.S.–Non-thesis track\(^1\): With program approval, students are allowed to count no more than 17 credits of graduate coursework from other institutions. Coursework earned five or more years prior to admission to a master's degree or earned ten years or more prior to admission to a doctoral degree is not allowed to satisfy requirements.

UW–Madison Undergraduate

With program approval, students are allowed to count no more than 7 credits of graduate coursework taken as an undergraduate at UW-Madison, as long as those credits were not applied toward an undergraduate degree. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

UW–Madison University Special

With program approval, students are allowed to count no more than 15 credits of coursework numbered 300 or above taken as a UW–Madison Special student. Coursework earned five or more years prior to admission to a master's is not allowed to satisfy requirements.

PROBATION

A semester GPA below 3.0 will result in the student being placed on academic probation. If a semester GPA of 3.0 is not attained during the subsequent semester of full time enrollment (or 12 credits of enrollment if enrolled part-time) the student may be dismissed from the program or allowed to continue for 1 additional semester based on advisor appeal to the Graduate School.

The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

Probation is based on student status. The status of a student can be one of three options:

1. Good standing (progressing according to standards; any funding guarantee remains in place).
2. Probation (not progressing according to standards but permitted to enroll; loss of funding guarantee; specific plan with dates and deadlines in place in regard to removal of probationary status).
3. Unsatisfactory progress (not progressing according to standards; not permitted to enroll, dismissal, leave of absence or change of advisor or program).

ADVISOR / COMMITTEE

All students are required to conduct a yearly progress report meeting with their advisor, scheduled by December 31 and completed by April 30. Failure to do so will result in a hold being placed on the student’s registration.

CREDITS PER TERM ALLOWED

15 credits

TIME CONSTRAINTS

The M.S. degree should be completed within three years. For additional time constraints, please consult the Graduate School Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy).

OTHER

n/a

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PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School's professional development resources (https://grad.wisc.edu/pd) to build skills, thrive academically, and launch your career.

PROGRAM RESOURCES

AOS Resources for Professional Development

Please go to the AOS handbook (http://aoswebsite.aos.wisc.edu/academics/graduate/handbook/career) to see the professional development resources available to our graduate students.

LEARNING OUTCOMES

1. Acquisition of a broad foundation of knowledge contained in our graduate-level core courses: ATM OCN 610 Geophysical Fluid Dynamics I, ATM OCN 611 Geophysical Fluid Dynamics II, ATM OCN 630 Introduction to Atmospheric and Oceanic Physics, ATM OCN...
640 Radiation in the Atmosphere and Ocean, and ATM OCN 660 Introduction to Physical Oceanography.

2. Have learned the historical origin and significance of certain issues central to the field by taking a special seminar course (ATM OCN 900 Seminar-Meteorology).

3. Have developed a good problem-solving skill that prepares them to become efficient supporting scientists for research institutions or effective career atmospheric professionals in operational units of government or commercial institutions.

4. Articulate, critique, or elaborate the theories, research methods, and approaches to inquiry or schools of practice in the field of study.

5. Recognize and apply principles of ethical and professional conduct.

PEOPLE

PROFESSORS
Ackerman, Steve
Desai, Ankur
Hitchman, Matt
Holloway, Tracey
Martin, Jonathan
Morgan, Morgan
Petty, Grant
Tripoli, Greg (chair)
Vimont, Dan

ASSOCIATE PROFESSORS
Back, Larissa
L’Ecuyer, Tristan