ATMOSPHERIC AND OCEANIC SCIENCES: RESEARCH PROGRAM, M.S.

This is a named option within the Atmospheric and Oceanic Sciences M.S. (http://guide.wisc.edu/graduate/atmospheric-oceanic-sciences/atmospheric-oceanic-sciences-ms/)

For the M.S. Research named option, students will work with faculty, students, and staff engaged in research across the entire spectrum of topics in the Atmospheric and Oceanic Sciences.

SYNOPTIC METEOROLOGY (HTTPS://WWW.AOS.WISC.EDU/RESEARCH/SYNOPTIC/)

Understanding the synoptic and mesoscale behavior of tropical and extra-tropical cyclones requires a wide range of techniques. We are investigating tropical cyclone initiation and developing an idealized model of the cyclone life cycle. Other projects include work in forecast sensitivity, targeted observations, 4-D assimilation of satellite winds into numerical forecast models, and the nature of the mid-latitude occlusion process and cyclone decay.

CLIMATE AND CLIMATE CHANGE (HTTPS://WWW.AOS.WISC.EDU/RESEARCH/CLIMATE/)

Climate research involves defining the physical, chemical, and biological behavior of many components of the climate, modeling these components in an interactive system, and obtaining appropriate observational information to define the climate and its changes. We have ongoing studies on paleoclimate and recent climate observations and use these in conjunction with comprehensive climate system models to try to understand the characteristics and physics of climate variations on many time scales.

LARGE SCALE DYNAMICS (HTTPS://WWW.AOS.WISC.EDU/RESEARCH/DYNAMICS/)

Substantive forcing and nonlinear processes are important for large scale dynamics of both the atmosphere and ocean circulations. The challenge remains to define and study the interactions of circulations with many time and spacial scales in order to understand the observed lifecycles of atmospheric and oceanic systems and the dominant variability time and spacial scales. Our studies include atmospheric intraseasonal and interannual variability and oceanic decadal variability.

RADIATION AND REMOTE SENSING (HTTPS://WWW.AOS.WISC.EDU/RESEARCH/RADIATION/)

Radiation emitted and absorbed by the Earth system drives the large scale circulations of the atmosphere and ocean. We are working to understand the flow of radiant energy through clear and cloudy skies, and to use measurements of radiation to remotely sense properties of the atmosphere and surface.

CLOUD AND ATMOSPHERIC PHYSICS (HTTPS://WWW.AOS.WISC.EDU/RESEARCH/PHYSICS/)

Clouds are the most visible part of weather phenomena and influence the larger scale environment through the release of latent heat. We study the physical and chemical processes related to the formation and growth of cloud and precipitation particles (cloud and rain drops, graupel, hail, and snow crystals) and the interaction between clouds and their dynamical environments. Other projects center on processes such atmospheric electricity, aerosol physics, and air pollution problems.

OCEANOGRAPHY (HTTPS://WWW.AOS.WISC.EDU/RESEARCH/OCEANOGRAPHY/)

The ocean acts as the flywheel of the climate system because of its huge thermal inertia and ability to regulate the atmospheric carbon content. The ocean plays a critical role in short-term climate variability (including phenomena like El Nino) and long-term climate change. Research at the University of Wisconsin focuses on the fundamental physical and geochemical processes that drive ocean circulations, and on the climatic impacts that result.

ADMISSIONS

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 (https://grad.wisc.edu/apply/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/).

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>January 15</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>December 1</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>January 15</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Required.</td>
</tr>
<tr>
<td>English Proficiency Test</td>
<td>Every applicant whose native language is not English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements (<a href="https://grad.wisc.edu/apply/requirements/#english-proficiency">https://grad.wisc.edu/apply/requirements/#english-proficiency</a>).</td>
</tr>
<tr>
<td>Other Test(s) (e.g., GMAT, MCAT)</td>
<td>n/a</td>
</tr>
<tr>
<td>Letters of Recommendation</td>
<td>3</td>
</tr>
</tbody>
</table>

Supplemental form indicating research areas and advisor preferences required.

Overall, our criteria for admissions is holistic and we generally favor high quality applicants who have:

- Evidence of interest in meteorological, climate, ocean, and or remote sensing research
- Sufficient background in prerequisite courses to be successful in ATM OCN courses and research, regardless of academic major
- Interests that match interests of current faculty seeking students
- Prior experience in research through thesis work, practicum courses, internships, summer research experiences, presentation/publication, etc...
• Received nationally competitive or University–wide awards or fellowships (e.g., NSF GFRP)
• Evidence of solid written and oral English and scientific communication skills
• GPA, GRE, and TOEFL scores reflective of academic strength
• Ability to enhance the academic, geographic, gender, ethnic, economic, or cultural diversity of our department, especially for underrepresented groups

Applications submitted by January 15th are given highest consideration for Fall semester admission. Spring semester admission is also possible, but less common. All applicants are assessed and ranked by an admissions committee chaired by the Graduate Program Chair. Admission priority is given to the highest ranked applicants who best meet our application criteria (usually ~25-30% for domestic applicants). International applications are not admitted without a source of funding (assistantship, fellowship, or personal) and advisor directly identified.

An offer of admission for fall, typically made in February or early March, does not guarantee funding. Assistantship and internal fellowship decisions are made jointly by the admissions committee and the faculty or group providing the funding in a separate process, with decisions made typically by March-April. You will be notified if funding for you becomes available. Typically we are able to fund approximately 8-10 students a year, primarily by research assistantship. The department discourages self-funding of Ph.D. degrees, but will allow it for M.S. For fall admission, you will have until April 15 to accept or reject any offers of admission or funding.

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 restrictions 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.

NAMED OPTION REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<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>
</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>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>30 credits</td>
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<tr>
<td>Credit</td>
<td></td>
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<tr>
<td>Requirement</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>16 credits</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
</tr>
<tr>
<td>Credit</td>
<td></td>
</tr>
<tr>
<td>Requirement</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>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>Graduate</td>
<td></td>
</tr>
<tr>
<td>Coursework</td>
<td></td>
</tr>
<tr>
<td>Requirement</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>3.00 GPA required.</td>
</tr>
<tr>
<td>Graduate GPA</td>
<td></td>
</tr>
<tr>
<td>Requirement</td>
<td></td>
</tr>
<tr>
<td>Other Grade</td>
<td>A grade of B or greater is required for the 12 credits of lecture courses in the department numbered 400 or above.</td>
</tr>
<tr>
<td>Requirements</td>
<td></td>
</tr>
</tbody>
</table>

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.

Assessments | A master’s thesis is required, and must be approved by and the major professor and two additional faculty members. |
Examinations | A public oral presentation of presentation of the thesis research is required. |
Language | No language requirements. |
Requirements | |

REQUIRED COURSES

There is a set of five 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:
In consultation with their advisor, every student seeking a M.S. degree, will design a curriculum that must be approved by their advisor.

- 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.

### PREFERENCES

#### 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.

#### NAMED OPTION-SPECIFIC POLICIES

### PRIOR COURSEWORK

**Graduate Work from Other Institutions**

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.

**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.

### GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- **Bias or Hate Reporting** (https://doso.students.wisc.edu/bias-or-hate-reporting/)
- **Graduate Assistantship Policies and Procedures** (https://hr.wisc.edu/policies/gapp/#grievance-procedure)
- **Hostile and Intimidating Behavior Policies and Procedures** (https://hr.wisc.edu/hib/)
  - Office of the Provost for Faculty and Staff Affairs (https://facstaff.provost.wisc.edu/)
- **Dean of Students Office** (https://doso.students.wisc.edu/) (for all students to seek grievance assistance and support)
- **Employee Assistance** (http://www.eao.wisc.edu/) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
  - **Employee Disability Resource Office** (https://employeedisabilities.wisc.edu/) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- **Graduate School** (https://grad.wisc.edu/) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- **Office of Compliance** (https://compliance.wisc.edu/) (for class harassment and discrimination, including sexual harassment and sexual violence)

<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 660</td>
<td>Introduction to Physical Oceanography</td>
<td>3</td>
</tr>
</tbody>
</table>
• Office of Student Conduct and Community Standards (https://conduct.students.wisc.edu/) (for conflicts involving students)
• Ombuds Office for Faculty and Staff (http://www.ombuds.wisc.edu/) (for employed graduate students and post-docs, as well as faculty and staff)
• Title IX (https://compliance.wisc.edu/titleix/) (for concerns about discrimination)

Students should contact the department chair or program director with questions about grievances.

OTHER
n/a

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.

PEOPLE

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

ASSOCIATE PROFESSORS
Back, Larissa
L'Ecuyer, Tristan

ASSISTANT PROFESSORS
Henderson, Stephanie
Maroon, Elizabeth
Rowe, Angela