

# ATMOSPHERIC AND OCEANIC SCIENCES: RESEARCH PROGRAM, MS

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

For the MS 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/](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/](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/](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 spatial scales to understand the observed lifecycles of atmospheric and oceanic systems and the dominant variability of time and spatial scales. Our studies include atmospheric intraseasonal and interannual variability and oceanic decadal variability.

## RADIATION AND REMOTE SENSING ([HTTPS://WWW.AOS.WISC.EDU/RESEARCH/RADIATION/](https://www.aos.wisc.edu/research/radiation/))

Radiation emitted and absorbed by the Earth's 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/](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 raindrops, graupel, hail, and snow crystals) and the interaction between clouds and their dynamic environments. Other projects center on processes such as atmospheric electricity, aerosol physics, and air pollution problems.

## OCEANOGRAPHY ([HTTPS://WWW.AOS.WISC.EDU/RESEARCH/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

### 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/>).

Requirements	Detail
Fall Deadline	January 1
Spring Deadline	October 12
Summer Deadline	January 1
GRE (Graduate Record Examinations)	Not required but may be considered if available.
English Proficiency Test	Every applicant whose native language is not English, or whose undergraduate instruction was not exclusively in English, must provide an English proficiency test score earned within two years of the anticipated term of enrollment. Refer to the Graduate School: Minimum Requirements for Admission policy: <a href="https://policy.wisc.edu/library/UW-1241">https://policy.wisc.edu/library/UW-1241</a> ( <a href="https://policy.wisc.edu/library/UW-1241/">https://policy.wisc.edu/library/UW-1241/</a> ).
Other Test(s) (e.g., GMAT, MCAT)	n/a
Letters of Recommendation Required	3

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 English proficiency test 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 the above deadline 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. We do not typically provide teaching assistantships to incoming students. The department discourages self-funding of PhD degrees, but will allow it for MS. For fall admission, you will have until April 15 to accept or reject any offers of admission or funding.

## 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/#policiesandrequirements>), in addition to the program requirements listed below.

### NAMED OPTION REQUIREMENTS MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

#### Mode of Instruction Definitions

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

**Evening/Weekend:** Courses meet on the UW-Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face:** Courses typically meet during weekdays on the UW-Madison Campus.

**Hybrid:** These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online:** These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

### CURRICULAR REQUIREMENTS

Requirement Detail	
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	15 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: <a href="https://policy.wisc.edu/library/UW-1244">https://policy.wisc.edu/library/UW-1244</a> ( <a href="https://policy.wisc.edu/library/UW-1244/">https://policy.wisc.edu/library/UW-1244/</a> ).
Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: <a href="https://policy.wisc.edu/library/UW-1203">https://policy.wisc.edu/library/UW-1203</a> ( <a href="https://policy.wisc.edu/library/UW-1203/">https://policy.wisc.edu/library/UW-1203/</a> ).
Other Grade Requirements	A grade of B or greater is required for the 12 credits of lecture courses in the department numbered 400 or above.

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

Code	Title	Credits
ATM OCN 610	Geophysical Fluid Dynamics I	3
ATM OCN 611	Geophysical Fluid Dynamics II	3
ATM OCN 630	Introduction to Atmospheric and Oceanic Physics	3
ATM OCN 640	Radiation in the Atmosphere and Ocean	3
ATM OCN 660	Introduction to Physical Oceanography	3

In consultation with their advisor, every student seeking a MS 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.

## 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.

### NAMED OPTION-SPECIFIC POLICIES

#### PRIOR COURSEWORK

##### Graduate Credits Earned at Other Institutions

With program approval, students are allowed to transfer no more than 14 credits of graduate coursework from other institutions. Coursework earned ten or more years prior to admission to a master's degree is not allowed to satisfy requirements.

##### Undergraduate Credits Earned at Other Institutions or UW-Madison

With program approval, students are allowed to transfer 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 ten or more years prior to admission to a master's degree is not allowed to satisfy requirements.

##### Credits Earned as a Professional Student at UW-Madison (Law, Medicine, Pharmacy, and Veterinary careers)

Refer to the Graduate School: Transfer Credits for Prior Coursework (<https://policy.wisc.edu/library/UW-1216/>) policy.

##### Credits Earned as a University Special Student at UW-Madison

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

### PROBATION

Refer to the Graduate School: Probation (<https://policy.wisc.edu/library/UW-1217/>) policy.

### 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 may result in a hold being placed on the student's registration.

### CREDITS PER TERM ALLOWED

15 credits

### TIME LIMITS

The MS 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/>)
- 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://employee disabilities.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)

- Office Student Assistance and Support (OSAS) (<https://osas.wisc.edu/>) (for all students to seek grievance assistance and support)
- 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. They may also contact the L&S Academic Divisional Associate Deans, the L&S Associate Dean for Teaching and Learning Administration, or the L&S Director of Human Resources.

## OTHER

n/a

## PROFESSIONAL DEVELOPMENT

### 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

### PEOPLE

See department website for list of faculty (<https://www.aos.wisc.edu/faculty/>).