

# ATMOSPHERIC AND OCEANIC SCIENCES: PROFESSIONAL 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/>).

The MS-AOS: Professional Program in Atmospheric and Oceanic Sciences focuses on developing the in-demand skills needed to succeed and become leaders in the rapidly expanding and changing industry of meteorological consulting, risk management, and operational forecasting. The program provides training in fundamental atmospheric sciences as well as skill development in forecasting, modeling, data analysis, scientific communication, and evaluation of research for professional careers in both government and commercial institutions.

We offer four specialization internal pathways:

**Forecasting and Modeling:** Weather and climate computer models are increasingly complex, specialized, and are used in everyday decision making by a large number of industries and people. Skilled modelers who understand the theory, can run the models, and interpret the output are in high demand in industry and agencies like NOAA and NASA. Gain insight into how models work and experience in running state-of-the-art models in our field.

**Air Quality Science and Regulation:** Air pollution affects public health globally, and understanding how emissions, atmospheric transport, and human impacts are linked requires a deep understanding of chemistry, dynamics, epidemiology, and policy. Our air quality pathway prepares students to tackle key pollution problems.

**Climate Science, Risk Management, and Communication:** Climate change is a leading environmental problem of our generation. Skilled leaders who can evaluate climate variability from seasonal to century timescales, connect these to impacts and risks to society, and present these to diverse audiences in government and the private sector are in high demand.

**Satellite Meteorology:** UW-Madison is the birthplace of satellite meteorology and home of the UW Space Sciences and Engineering Center (SSEC) (<https://www.ssec.wisc.edu/>) and the NOAA Cooperative Institute for Meteorological Satellite Studies (<https://cimss.ssec.wisc.edu/>), both located in the same building as our department. You have access to these expert scientists. This track prepares students in real-world analysis of weather satellite, radar, and allied remote sensing technologies.

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	February 1
Spring Deadline	This program does not admit in the spring.
Summer Deadline	This program does not admit in the summer.
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

Admission to the Professional Program requires the same academic strength and expectations of the Research Program, except that you do not need to elect a research topic.

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 careers
- Sufficient background in prerequisite courses to be successful in AOS courses and careers, regardless of academic major
- Evidence of solid written and oral English 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

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. No assistantship funding is available in the Professional program.

## ADMISSIONS

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Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed

## FUNDING

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### 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.

### PROGRAM INFORMATION

Students enrolled in this program are not eligible to receive tuition remission from graduate assistantship appointments at this institution.

AOS Professional Master's students can be hired as TAs only within AOS and only below the tuition remission appointment level of 33.3%.

Students in this program may not switch to the research program and then back to the professional program. A one-way switch is allowed.

## 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

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

#### 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: <https://policy.wisc.edu/library/UW-1244> (<https://policy.wisc.edu/library/UW-1244/>).

Overall Graduate GPA Requirement 3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: <https://policy.wisc.edu/library/UW-1203> (<https://policy.wisc.edu/library/UW-1203/>).

Other Grade Requirements Students must earn a C or above in all coursework.

Students may not have any more than two incompletes on their record at any one time.

Assessments and Examinations None.

Language Requirements No language requirements.

## REQUIRED COURSES

Code	Title	Credits
<b>Fundamentals of ATM OCN</b>		<b>9-10</b>
Students pick three of the following.		
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	
ATM OCN 660	Introduction to Physical Oceanography	
<b>Technical Scientific Data Analysis, Measurements and/or Programming</b>		<b>5-6</b>
At least three credits must be in ATM OCN.		
ATM OCN 404	Meteorological Measurements	
ATM OCN 573	Computational Methods in Atmospheric and Oceanic Sciences	
ATM OCN 575	Climatological Analysis	
R M I 650	Sustainability, Environmental and Social Risk Management	
R M I 700	Principles of Risk Management	

### Applied Aspects of ATM OCN

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Students must pick a specialty option and PICK AT LEAST TWO courses of those lists for the specialty based on availability and interest, and AT LEAST ONE course either from the same specialty or another specialty. At least 6 of these credits must be ATM OCN.

*Climate*

ATM OCN/ ENVIR ST/ GEOG 332	Global Warming: Science and Impacts
ATM OCN 425	Global Climate Processes
ATM OCN/ ENVIR ST 520	Bioclimatology
ATM OCN 522	Tropical Meteorology
ATM OCN 705	The Middle Atmosphere
ATM OCN 712	General Circulation of the Atmosphere
ATM OCN 760	Large-Scale Ocean-Atmosphere Coupling
<i>Satellite Meteorology</i>	
ATM OCN 441	Radar and Satellite Meteorology
ATM OCN 637	Cloud Physics
ATM OCN/ ENVIR ST 745	Meteorological Satellite Applications
ENVIR ST/ CIV ENGR/ LAND ARC 556	Remote Sensing Digital Image Processing
<i>Air Quality</i>	
ATM OCN/ ENVIR ST 355	Introduction to Air Quality
CIV ENGR/ G L E 511	Mixing and Transport in the Environment
ATM OCN/ ENVIR ST 535	Atmospheric Dispersion and Air Pollution
ATM OCN 638	Atmospheric Chemistry
ATM OCN/ CIV ENGR 701	The Chemistry of Air Pollution
ATM OCN 773	Boundary Layer Meteorology
ENVIR ST/ POP HLTH 502	Air Pollution and Human Health
<i>Forecasting and Modeling</i>	
ATM OCN 610	Geophysical Fluid Dynamics I <sup>1</sup>
ATM OCN 751	The Frontal Cyclone
ATM OCN 753	Mesoscale Meteorology
ATM OCN 801	Topics in Theoretical Meteorology
<b>Professional Development</b>	
ATM OCN 810	Practical Training in Atmospheric and Oceanic Sciences I <sup>2</sup>
ATM OCN 811	Practical Training in Atmospheric and Oceanic Sciences II <sup>2</sup>
ATM OCN 999	Advanced Independent Study <sup>3</sup>
<b>Total Credits</b>	<b>30</b>

<sup>1</sup> ATM OCN 610 Geophysical Fluid Dynamics I can count only if not used to count for fundamentals requirement.

<sup>2</sup> ATM OCN 810 Practical Training in Atmospheric and Oceanic Sciences I and ATM OCN 811 Practical Training in Atmospheric and Oceanic Sciences II require a supervised 20–30 hour/week internship during the summer after completion of other course requirements. This course is taken in conjunction with 1 credit of ATM OCN 999 Advanced Independent Study. Placement in internship is made during the spring semester with support from the program coordinator and academic advisor. See program policies for more details.

<sup>3</sup> ATM OCN 999 Advanced Independent Study credit earned through 1–2 hours per week attendance and reporting on: weekly meeting with program advisor, participation in Graduate School professional development workshops, attendance at research seminars or lab meetings, participation at professional conferences, department presentation of CCM portfolio (summer). Write up on activities required each semester. ATM OCN 999 Advanced Independent Study is taken for one credit in each of fall, spring, and summer session. Summer session ATM OCN 999 Advanced Independent Study can be taken remotely if internship placement is off campus.

## Internship Requirement

At the end of the spring semester, all students are expected to have secured a paid or unpaid internship with a minimum of 10 hours per week of expected work for a minimum of 8 weeks. The internship, occurring in conjunction with online classes ATM OCN 810, ATM OCN 811, and ATM OCN 999, can include placement in a private company, public sector agency or lab, university setting, on or off campus, based on student interest, availability, and advisor approval. It is the responsibility of both the student and the program coordinator to assist in this match. In case the student is unable to secure an internship or seeks a more entrepreneurial approach, the student can propose an alternate in lieu of internship. The alternative must still meet minimum hour and length requirements, but may include independent business start-up planning, direct consulting with faculty, or other creative approaches. The alternative must have a direct mentor or supervisor identified and requires approval of the program director.

## Other Policy

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.

# 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

Students will not be permitted to transfer credits from previously earned graduate coursework.

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

With advisor approval, up to 7 credits numbered 300 or above may transfer toward the degree specialization areas (not the core degree requirements). These credits may transfer toward the minimum graduate coursework (50%) requirement if they are in courses numbered 700 or above. No credits may transfer toward the minimum graduate residence

credit requirement. 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 up to 7 credits of coursework numbered 300 or above taken as a UW-Madison University Special student toward the minimum graduate degree credit requirement.

These credits may transfer toward the minimum graduate coursework (50%) requirement if they are in courses numbered 700 or above or are taken as part of a capstone certificate. Coursework earned ten or more years prior to admission is not allowed to satisfy requirements.

## PROBATION

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

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).

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), this will be deemed unsatisfactory progress and the student may be dismissed from the program or allowed to continue for one additional semester based on advisor appeal to the Graduate School.

## ADVISOR / COMMITTEE

Professional MS students will all be advised by the faculty director, with support from the program coordinator. Delegation of advising to other faculty may occur depending on program size and specific interests.

## CREDITS PER TERM ALLOWED

15 credits

## TIME LIMITS

The Professional degree should take 12 months to complete at full-time enrollment, starting in fall semester. Refer to the Graduate School: Time Limits (<https://policy.wisc.edu/library/UW-1221/>) policy.

## 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://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 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

Students in the Professional program may not switch to the Research program and then back to Professional program. A one-way switch is allowed.

## 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/>).