ATMOSPHERIC AND OCEANIC SCIENCES - MASTER OF SCIENCE (MS)

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

Students can earn a master's degree with either a thesis or an exam. Students considering master's study in atmospheric and oceanic sciences should carefully read the Master's Degree Requirements (catalog.colorado.edu/graduate/degree-requirements/masters-degree-requirements) section of this catalog, as well as the department's Prospective Graduate Students (http://www.colorado.edu/atoc/academics/prospective-graduate-students) and Current Graduate Students (http://www.colorado.edu/atoc/academics/current-graduate-students) webpages.

Requirements

Course Requirements

Students must complete at least 30 credit hours of course work, of which 24 must be from courses numbered 5000 or above, and at least 15 must be from ATOC graduate courses, including four of the core ATOC courses.

- Up to 6 credit hours of approved 3000- and 4000-level course work from engineering, math, physics, chemistry or biology may be applied toward the MS degree. No credit will be given toward the MS degree for ATOC course work below the 5000 level.
- A minimum of 15 credit hours from regular ATOC courses (independent study courses cannot be used to satisfy this requirement).
- Four courses within one of the two tracks of ATOC core courses:

**Atmosphere Track (A-Track)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATOC 5050</td>
<td>Atmospheric Thermodynamics and Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5051</td>
<td>Introduction to Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5060</td>
<td>Dynamics of the Atmosphere and Oceans</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5151</td>
<td>Atmospheric Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5235</td>
<td>Introduction to Atmospheric Radiative Transfer and Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5600</td>
<td>Physics and Chemistry of Clouds and Aerosols</td>
<td>3</td>
</tr>
</tbody>
</table>

**Oceanography Track (O-Track)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATOC 5050</td>
<td>Atmospheric Thermodynamics and Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5051</td>
<td>Introduction to Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5060</td>
<td>Dynamics of the Atmosphere and Oceans</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5200</td>
<td>Biogeochemical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>ATOC 5235</td>
<td>Introduction to Atmospheric Radiative Transfer and Remote Sensing</td>
<td>3</td>
</tr>
</tbody>
</table>

- Up to 3 credit hours of Independent Study (ATOC 5900), Weather Forecasting and Discussion (ATOC 6700) and/or Seminar in Atmospheric and Oceanic Sciences (ATOC 6020) may be used toward the 30 hours of regular course work in the degree requirements.
- Up to 9 credit hours may be transferred from another accredited institution and applied toward an MS degree. Transfer credit for ATOC core course work must be approved by the graduate advisor.
- A student is required to maintain at least a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the MS, a course mark below C is unsatisfactory and will not be counted toward fulfilling requirements for the degree.

Degree Plans

The master's degree will be a Master of Science in atmospheric and oceanic sciences, regardless of track chosen. The master's thesis is not constrained by choice of track.

**Plan I: Thesis Option**

Students must complete a minimum of 4 (but no more than 6) thesis hours, which can be counted toward the total 30 hours of course work and the 15 hours of ATOC course work requirements. Students must successfully complete an MS thesis and oral final examination based on the thesis.

Note: Students planning to pursue a PhD degree may elect to obtain the MS degree, but this is not requirement for advancement to the PhD program.

**Thesis Guidelines**

The MS thesis must consist of original and independent research conducted by the graduate student under the supervision of the research advisor. The thesis topic must be related to the major field, and:

- Represent the equivalent of 4 to 6 credit hours of course work.
- Receive the approval of the major department at least 30 days before commencement at which the degree is to be conferred.
- Be completed at the time the final examination is held.
- Comply with the University of Colorado Graduate School Thesis and Dissertation Specifications.
- Be filed with the Graduate School by posted deadlines for the semester for which the degree is to be conferred.

**Thesis Exam Committee**

The examination committee for the MS thesis final exam will consist of three graduate faculty members, at least two of whom must be ATOC core faculty members. The examination consists of a 30-minute oral presentation given by the candidate on the thesis subject, followed by a period of questions for the candidate by the committee. The oral presentation is open to anyone who wishes to attend. The full examination typically does not exceed two hours in duration.

Any student with a research advisor outside of ATOC (e.g., an advisor who is from another department or is a full-time employee at NCAR, NOAA, etc.), must also have an academic advisor who is an ATOC core faculty member. The academic advisor should be identified by the student in collaboration with their research advisor as soon as possible, and no later than one month after research begins. Once an ATOC faculty member agrees to act as academic advisor, it is their responsibility to communicate ATOC policies and requirements to the research advisor, and to ensure that the student is meeting all ATOC requirements and making good academic progress toward the degree.

**Plan II: Non-Thesis/Final Exam Option**

The requirements for an MS degree non-thesis/final exam option include the following:
Atmospheric and Oceanic Sciences - Master of Science (MS)

- 30 semester hours of course work, of which 24 must be from courses numbered 5000 or above, and at least 15 must be from ATOC graduate courses, including four of the core ATOC courses.
- Successful completion of a written final examination based on ATOC regular course work. The ATOC Comprehensive Exam I is typically used to satisfy this requirement.

Note: Students planning to pursue a PhD degree may elect to obtain the MS degree, but this is not a requirement for advancement to the PhD program.

**Time Limit**

Students are expected to complete all degree requirements within four years of the date of commencing course work, but normally in two years. Students may petition the Graduate School for extension(s).