Earth System Science, MS

Degree Requirements

• To earn a master’s degree in Earth System Science (ESS), each student must satisfy all requirements of the School of Graduate Studies and of the Atmospheric Science Department.

• Students must formulate an appropriate Program of Study (POS), in consultation with a faculty advisor and chair, before the end of the second semester.

• Students must maintain a cumulative GPA of at least 3.000.

Option 1 - Thesis

Minimum degree requirements under this plan include completion of at least 24 credit hours of core (nine credit hours) and elective (15 credit hours) course work and at least six credit hours of thesis research. At least 50 percent of the required 24 semester hours must be from 600 level (or higher) courses. In addition, all M.S. in ESS students are required to take six credit hours of supporting courses, which do not count toward minimum degree requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES 507</td>
<td>ENVIRONMENTAL THREATS, PUBLIC POLICY, &amp; DECISION MAKING</td>
<td>3</td>
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<tr>
<td>AES 514</td>
<td>GEOSPATIAL APPLICATIONS</td>
<td>3</td>
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<tr>
<td>AES 630</td>
<td>PHYSICAL CLIMATOLOGY</td>
<td>3</td>
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<tr>
<td>AES 508</td>
<td>PYTHON FOR ID ESS APPLICATIONS</td>
<td>3</td>
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<tr>
<td>AES 780</td>
<td>SEMINAR</td>
<td>1</td>
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<tr>
<td>AES 781</td>
<td>STUDENT SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>AES 782</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>1</td>
</tr>
<tr>
<td>AES 699</td>
<td>MASTER'S THESIS</td>
<td>1-6</td>
</tr>
</tbody>
</table>

Total Semester Hours 31-36

1 Students must earn a B or above in core courses.
2 Students who have earned a B or better in the undergraduate equivalent of AES 507, AES 508 (or AES 509) and AES 514 at UAH do not have to re-take the course at the graduate level. However, their Program of Study must include alternative semester hours to replace AES 507 and AES 514 at an appropriate level approved by their advisor and chair of the department.
3 If a student has advanced GIS experience, the AES 514 core may be replaced with an advanced course at the discretion of the Department Chair.
4 9 of these Elective semester hours must be from 600 level (or higher) courses.
5 Three Elective semester hours may be outside of the ESS/ATS only with advisor’s approval.

Additional Information

One of the goals of this program is to train the student in transitioning research and observational products related to ESS into public policy and decision-making arenas. Therefore, it is necessary that the student spend time working with a decision-making organization. The student must submit a five-page thesis proposal to be approved by the advisor and committee by the end of the third full semester.

Option 2 - Non-Thesis

Minimum degree requirements under this plan include completion of at least 30 semester hours of graduate course work, which includes core (12 credit hours) and elective courses (18 credit hours). At least 50 percent of the required 30 credit hours must be from 600 level (or higher) courses. Students are also required to take six credit hours of supporting courses. The supporting courses do not count toward minimum degree requirements.

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<td>AES 507</td>
<td>ENVIRONMENTAL THREATS, PUBLIC POLICY, &amp; DECISION MAKING</td>
<td>3</td>
</tr>
</tbody>
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**Elective Courses**
- AES 508 PYTHON FOR ID ESS APPLICATIONS 3
  or AES 509 SCIENTIFIC PROGRAMMING FOR EARTH & ATMOSPHERIC SCIENTISTS
- AES 514 GEOSPATIAL APPLICATIONS 3
- AES 632 ENERGY, CLIMATE, ENVIRONMENT 3

**Required Supporting Courses**
- AES 780 SEMINAR 1
- AES 781 STUDENT SEMINAR 1
- AES 782 PROFESSIONAL DEVELOPMENT 1
- AES 698 MASTERS CAPSTONE 3
  or AES 690 (with approval) 3

**Total Semester Hours** 36

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1. Students must earn a B or above in core courses.
2. Students who have earned a B or better in the undergraduate equivalent AES 507, AES 508 (or AES 509), and AES 514 at UAH do not have to re-take the course at the graduate level. However, their Program of Study must include alternative semester hours at the appropriate level approved by their advisor and chair of the department.
3. If a student has advanced GIS experience, the AES 514 core may be replaced with an advanced course at the discretion of the Department Chair.
4. Course selection from outside the department and colleges must be done with approval and guidance from faculty mentors and the department chair; faculty mentors will guide the student to pursue a coherent suite of complementary courses outside AES.

**Additional Information**

Non-thesis students will pursue approved external internship programs with the help of their mentor; in the event that a student does not receive an external internship, they will be required to do a capstone project with an ATS faculty member or approved ESSC scientist/researcher.

**M.S. Supervisory Committee**

The committee must consist of a minimum of three members and be approved by the Department Chair. Two of the three members must be full-time, tenured or tenure-earning, or emeritus faculty members in the department. The other member must be from a decision-making/end-user organization. The student must work closely with the advisor and committee members to select a thesis topic. Advisors have the responsibility to shape the research and ensure that a thesis can be written and defended within the time needed for graduation.

**Comprehensive Examination/Thesis Defense**

A final comprehensive examination is required of all candidates for a master’s degree. In accordance with the Graduate School Dates & Deadlines, a written notice of the time and place of the examination/defense must be sent to the Graduate Dean. After approval by the Graduate Dean, the Department Chair sends a copy of the written Notification of Oral Examination/Defense to the candidate and each member of the committee. The candidate will be examined primarily on the thesis but they may also be tested on relevant course work. The examination is conducted by a committee of at least three faculty members appointed by the Department Chair and approved by the Graduate Dean. The examination must be given at least six weeks before the end of the semester in which degree requirements are expected to be completed, and the results reported within two working days to the Graduate Dean. A student may take the examination only twice.

- **Thesis** candidates will be examined primarily on the thesis by a committee of at least three faculty members appointed by the Department Chair and approved by the Graduate Dean.
- **Non-thesis** students will write up a Masters-level research capstone project, present their findings in a formal presentation, and respond to questions from their faculty mentor, other faculty, and the public; successful and approved completion of this, as determined by the faculty mentor and department chair, will result in a pass for the non-thesis option.

**Paperwork**

- Students must formulate an appropriate POS, in consultation with a faculty advisor and chair, before the end of the second semester.
- Application for Graduate Degree according to Graduate School Dates & Deadlines.
- Notification of Oral Examination/Defense according to Graduate School Dates & Deadlines.