

Earth System Science, MS

The Earth System Science program is administered by the Atmospheric and Earth Science department.

Degree Requirements

- To earn a master's degree in Earth System Science, 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 3.0.

Option 1 - Thesis

Minimum degree requirements under this plan include completion of at least 24 credit hours of core (9 credit hours) and elective (15 credit hours) course work and at least 6 credit hours of thesis research. At least 50% of the required 24 semester hours must be from 600 level (or higher) courses. In addition, all MS in ESS students are required to take 6 credit hours of supporting courses, which do not count toward minimum degree requirements.

Code	Title	Semester Hours
Required Core Courses ¹		
ESS 507	ENVRNMTL THRSTS PBL PY DEC MKG ²	3
ESS 514	GEOSPATIAL APPLICATIONS ^{2,3}	3
ESS 630	PHYSICAL CLIMATOLOGY	3
Required Supporting Courses		
ESS 508 or ESS 509	PYTHON FOR ID ESS APPLICATIONS SCI PROGRMNG FOR EARTH & ATMOS	3
ESS/ATS 780	SEMINAR	1
ESS/ATS 781	STUDENT SEMINAR	1
ESS/ATS 782	PROFESSIONAL DEVELOPMENT	1
Elective Courses		
Select 15 semester hours of electives ^{4,5}		15
Thesis Credits		
ESS 699	MASTER'S THESIS	6
Total Semester Hours		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 ESS 507, ESS 508 (or ESS 509) and ESS 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 ESS 507 and ESS 514 at an appropriate level approved by their advisor and chair of the department.

³ If a student has advanced GIS experience, the ESS 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 Earth System Science 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 5 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 CH) and elective courses (18 CH). At least 50% of the required 30 credit hours must be from 600 level (or higher) courses. Students are also required to take 6 credit hours of supporting courses. The supporting courses do not count toward minimum degree requirements.

Code	Title	Semester Hours
Required Core Courses ¹		
ESS 507	ENVRNMTL THRSTS PBL PY DEC MKG ²	3
ESS 508	PYTHON FOR ID ESS APPLICATIONS ²	3
or ESS 509	SCI PROGRMNG FOR EARTH & ATMOS	
ESS 514	GEOSPATIAL APPLICATIONS ^{2,3}	3
ESS 632	ENERGY, CLIMATE, ENVIRONMENT	3
Elective Courses		
Select 3 semester hours from 500 or 600 level courses within ESS/ATS		3
Select 3 semester hours from 600 level courses within ESS/ATS		3
Select 3 semester hours from 500 or 600 level courses and may be outside of ESS/ATS ⁴		3
Select 9 semester hours from 600 level courses and may be outside of ESS/ATS ⁴		9
Required Supporting Courses		
ESS 780	SEMINAR	1
ESS 781	STUDENT SEMINAR	1
ESS 782	PROFESSIONAL DEVELOPMENT	1
ESS 690	SPECIAL TOPICS IN ESS ⁵	3
Total Semester Hours		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 ESS 507, ESS 508 (or ESS 509), and ESS 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 ESS 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 ESS.

⁵ ESS 690 Special Topics course will be replaced by ESS 690, Internship/MS Capstone course.

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 Studies Dates and 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 Program of Study (POS), in consultation with a faculty advisor and chair, before the end of the second semester.
- Application for Graduate Degree according to Graduate Studies *Dates & Deadlines*.
- Notification of Oral Examination/Defense according to Graduate Studies *Dates & Deadlines*.