

# Master of Science in Earth System Science – Policies



## 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.
- Graduate Assistants need to enroll in at least 3 departmentally approved non-thesis graduate credit hours every fall and spring semester even if they have completed all the requirements of the POS. An exemption may be allowed for one semester during the pursuit of the terminal degree, usually the semester during which one defends their thesis or dissertation. Advisor approval is required.

Two options are available:

### 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.

#### ► REQUIRED CORE COURSES (total of 9 credit hours)

- **ESS 507** Environmental Threats, Public Policy and Decision Making, 3 credit hours
- **ESS 514** Geospatial Applications, 3 credit hours
- **ESS 630** Physical Climatology, 3 credit hours

Students must earn a B or above in core courses.

*Students who have earned a B or better in the undergraduate equivalent ESS 507, ESS 508(or ESS 509), ESS 514 at UAH do not have to re-take the course at the graduate level. However, their Program of Study must include alternative credit hours at the appropriate level approved by their advisor and chair of the department.*

*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.*

#### ► ELECTIVE COURSES (total of 15 credit hours)

- Select 15 semester hours of elective courses.
  - 9 of these elective semester hours must be from 600 level (or higher) courses.
  - 3 elective semester hours may be outside of ESS/ATS only with advisor's approval.

*There are some courses that are not suited for the ESS POS and therefore require approval.*

#### ► REQUIRED SUPPORTING COURSES (total of 6 additional credit hours)

- **ESS 508** Python for Interdisciplinary Earth System Science Applications, 3 credit hours  
or  
**ESS 509** Applications of Computers in Meteorology, 3 credit hours
- **ESS/ATS 780** Seminar, 1 credit hour
- **ESS/ATS 781** Seminar Presentation, 1 credit hour
- **ESS/ATS 782** Professional Development, 1 credit hour

*Students who have earned a B or better in the undergraduate equivalent of ATS 509 at UAH have fulfilled the requirement.*

#### ► THESIS CREDITS (minimum of 6 credit hours)

- **ESS 699**

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 academic semester**. A completed and advisor-approved copy of the proposal should be sent to the Department Chair and Staff Assistant.

## 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.

### ► REQUIRED CORE COURSES (total of 12 credit hours)

- **ESS 507** Environmental Threats, Public Policy and Decision Making, 3 credit hours
- **ESS 508** Python for Interdisciplinary Earth System Science Applications, 3 credit hours  
or
- **ESS 509** Applications of Computers in Meteorology, 3 credit hours
- **ESS 514** Geospatial Applications, 3 credit hours
- **ESS 632** Energy, Climate, and Environment, 3 credit hours

Students must earn a B or above in core courses.

*Students who have earned a B or better in the undergraduate equivalent ESS 507, ESS 508(or ESS 509), ESS 514 at UAH do not have to re-take the course at the graduate level. However, their Program of Study must include alternative credit hours at the appropriate level approved by their advisor and chair of the department.*

*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.*

### ► ELECTIVE COURSES (total of 18 credit hours)

- Select **3** semester hours from 500 or 600 level (or higher) courses within ESS/ATS
- Select **3** semester hours from 600 level (or higher) courses within ESS/ATS
- Select **3** semester hours from 500 or 600 level courses and may be outside of ESS/ATS
- Select **9** semester hours from 600 level courses and may be outside of ESS/ATS

*Please note that ESS 699 (Master's Thesis) CH's cannot be used as elective courses. 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.*

### ► REQUIRED SUPPORTING COURSES (total of 6 additional credit hours)

- **ESS 690** Internship/MS Capstone, 3 credit hours
- **ESS 780** Seminar, 1 credit hour
- **ESS 781** Seminar Presentation, 1 credit hour
- **ESS 782** Professional Development, 1 credit hour

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. Please note that ESS 699 (Master's Thesis) CH's cannot be used to substitute for the Internship/MS Capstone course.

## Prerequisite Courses

Some thesis students may be required to take **ESS 501** (Survey of Atmospheric Science) and **ESS 513** (GIS and Image Processing) based on their educational background. These are tools courses meant to provide students with the necessary skills set to succeed in their other courses. The prerequisite courses do not count as Electives on the POS. Students should consult with their Advisor to determine if it will be necessary to take a prerequisite course.

## 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 to select a thesis topic and the committee members. Advisors have the responsibility to shape the research and ensure that a thesis can be written and defended within the time needed for graduation. External committee members seeking to travel to UAH to attend examinations and defenses must be funded by the Advisor. Otherwise, alternate arrangements, such as teleconference, must be made.

## 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 & 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.

## Check List for M.S. Program of Study (POS)

	Thesis Option	Credits	Term	✓
CORE	507	3		
	514	3		
	630	3		
REQUIRED	508 or 509	3		
	780	1		
	781	1		
	782	1		
ELECTIVE	600	3		
	600	3		
	600	3		
	500/600	3		
	500/600	3		
THESIS	699	3		
	699	3		

	Non-Thesis Option	Credits	Term	✓
CORE	507	3		
	508 or 509	3		
	514	3		
	632	3		
REQUIRED	690: Internship/ MS Capstone	3		
	780	1		
	781	1		
	782	1		
ELECTIVE	500/600	3		
	500/600	3		
	600	3		
	600	3		
	600	3		
	600	3		