

Honors in Earth Systems

The Earth Systems honors program provides students with an opportunity to pursue individual interdisciplinary research. It consists of a year-long research project that is mentored by one or more Earth Systems-affiliated faculty members, and culminates in a written thesis.

To qualify for the honors program, students must have and maintain a minimum overall GPA of 3.4. Potential honors students are encouraged to complete the *EARTHSYS 111 Biology and Global Change* and *EARTHSYS 112 Human Society and Environmental Change* sequence by the end of the junior year. Qualified students can apply in Spring Quarter of the junior year, or four quarters before graduation (check with program for specific application deadlines), by submitting a detailed research proposal and a brief statement of support from a faculty research adviser. Students who elect to do an honors thesis should begin planning no later than Winter Quarter of the junior year.

During the senior year, honors students enroll in 1-9 units of Earth Systems 199: Honors Program in Earth Systems within the thesis advisor's section (please contact Earth Systems if your advisor is not listed). These units can be split among quarters, but may not substitute for any other required parts of the Earth Systems Curriculum. Completion of the honors thesis satisfies the program's senior capstone requirement.

All senior honors students participate in four workshops (2 in fall, 1 each in winter and spring quarters) that provide necessary skills for developing a successful thesis and support a generative environment for students to address challenges encountered at each stage of the thesis research and writing process. The workshops are led by the Earth Systems Writing Specialist, Dr. Emily Polk.

All theses are evaluated for acceptance by the thesis faculty adviser and one additional faculty member, who is the second reader. Both the adviser and second reader must be members of the Academic Council. Acceptance into the Honors program is not a guarantee of graduating with the honors designation. The thesis must be accepted and approved by both readers and the Director of Earth Systems, and a minimum overall GPA of 3.4 must be maintained.

Honors students present their research at the Earth Systems Capstone and Thesis Symposium in Spring Quarter. Faculty advisers are encouraged to sponsor presentation of student research results at professional society meetings.

Exceptional honors thesis will be nominated for special recognition by the university and the Earth Systems Program. Nomination criteria include (1) the contribution of the thesis research to addressing an unanswered question in the scholarly field of interest; (2) relevance of research to an important social-environmental challenge; (3) rigorosity of research methodology; (4) interdisciplinarity of scope and methods; and (5) quality of writing.

If you have further questions, please contact Dr. Richard Nevle, Deputy Director, Earth Systems Program Yang and Yamazaki Environment and Energy Building, Room 133 (650) 724-0984; rnevle@stanford.edu

A Guide for Honors in Earth Systems

Completing an honors project is an opportunity to deepen your learning by working closely with a faculty member to conduct independent research and write up that research into an honors thesis. Making the decision to take on an honors project is an important one, and you should carefully consider what you hope to learn in the process of doing a thesis, and whether you can commit the time and effort required for the project to be successful. This guide provides a roadmap that will help you plan a successful honors project and stay on track to completing that project in a timely fashion. Please don't hesitate to seek help from your advisor and/or Earth Systems staff if you have questions, concerns, or run into any problems in the course of your research and writing.

Winter Quarter, Junior Year: Begin thinking about what kind of project you would like to conduct.

Ask yourself: What aspects of my education do I want to delve into more deeply? What kinds of questions do I want to answer? What kinds of data do I want to collect and work with? What skills do I need to learn to effectively analyze that data? Do I want to do lab work? Do I want to travel and collect data in the field or would I prefer working closer to home? What skills do I need to acquire prior to and during my research?

Begin researching faculty interests and secure a faculty advisor for your project. This advisor should be someone who has research interests that align with yours, who will have the time to meet with you regularly to discuss your work, and will read and provide comments on your thesis drafts. You should also work with your advisor to identify a second reader—this is a faculty member who will ultimately read and be tasked with approving your honors thesis. The university requires all honors theses to be read and approved by a second reader in addition to the advisor and the Department.

Your second reader must be an Academic Council member and must be approved by your faculty advisor. The second reader's interests should be related to your thesis work, and you should also meet with this person regularly for advice and input on your work. It will be in your best interests to have your second reader provide comments and suggestions on a draft of your thesis well before you submit the final version to them for approval.

Consider taking EARTH 100: Research Preparation for Undergraduates, offered in the Spring Quarter. This course is designed for undergraduates planning to conduct research during the summer with Stanford faculty, and will help you jump start your preparation as you gear up for your research in summer.

Consider applying for financial support for your research through the School of Earth, Energy & Environmental Sciences, VPUE, the Earth Systems Program, or other sources. Proposal deadlines for most funding programs are in winter quarter

HONORS THESIS TIMELINE

Spring Quarter, Junior Year: Honors applications are due! Meet with your advisor to discuss your project and plan out your timeline for your application to the Earth Systems Honors Program. Prepare your personal statement and obtain a letter of recommendation from your advisor. The letter of recommendation is crucial in the application process—make sure your advisor will be able to write a strong letter that addresses your ability to complete the project successfully and expresses their support for mentoring you through the research process.

As you prepare for the summer, review copies of prior Earth Systems Honors Theses. A comprehensive collection of all honors theses is available in Deana's office, and exemplars of recent Earth Systems honors theses are available online. You'll have access to the digital thesis collection once you are accepted to the Earth Systems Honors Program.

Summer: Begin background research for your project and start putting together your literature review. Begin data collection for your project and start preliminary analysis. Stay in contact with your advisor during this time.

At the outset of your honors work in your senior year, you should arrange to meet with your advisor regularly throughout the year, about every 2 weeks or so, to discuss your project and review your timeline and progress. Keep these appointments! In your meetings, seek critical feedback on your methods, analysis questions, prior relevant research for your literature review, writing style, etc. You should honestly discuss any difficulties you are facing and seek advice for resolving them.

Fall Quarter, Senior Year: Enroll in 1-9 units of EARTHSYS 199: Honors Program in Earth Systems with your thesis advisor's section (please contact Earth Systems if your advisor is not listed). These units can be split among quarters.

If possible, take Earth Systems 210A (Earth Systems Senior Capstone and Reflection) in fall quarter. The class provides support to help you write the introduction of your thesis and will enable you to begin building a cohort with other students in the honors program. As part of this class, you will have the opportunity to participate in two workshops led by Dr. Emily Polk, the Earth Systems Writing Specialist. These workshops will provide tools for helping you plan and scaffold your work, develop productive writing habits, and think in concrete and meaningful ways about approaching your work in an interdisciplinary way.

Meet with your advisor early in the quarter to talk about your progress and map out a plan for your work for the rest of the quarter. Begin data analysis and wrap up data collection. Complete your literature review. Write a draft of your introduction. The first draft, as a requirement for Earthsys 210A, will be due before Thanksgiving Break, and a revised version will be due at the end of the quarter. Begin work on your methods chapter. Discuss the format for your thesis with your advisor. At the end of the quarter, give your advisor your draft introduction and methods chapters for review.

Note: You may also apply for the Earth Systems Honors Program during the Fall quarter of your senior year, but if you apply at this deadline you must have already started on a project and begun data collection and analysis over the summer.

Winter Quarter, Senior Year: At this point you should be well into the analysis phase of your project with data collection complete, and you should be starting to write up your results/data chapters. Meet with your advisor regularly to discuss your progress. Incorporate your advisors comments into your drafts and update as needed. At the end of the quarter, give your advisor your draft data chapters for review. Make sure your second reader is available to read your draft thesis to provide comments and to approve your final thesis submission.

Participate in 3rd Honors Thesis Writing Workshop, which will focus on writing your discussion sections and integrating visuals, charts, graphs. This workshop, conducted in collaboration with the Human Biology Program's honors cohort, will give you a chance to learn with other peers and get feedback from Dr. Jennifer Stonaker, an expert in science communication.

Spring Quarter, Senior Year: You should be in full writing/revising mode at this point with all of your analysis complete. Write your conclusions chapter. You should be iterating on drafts of your thesis chapters with your advisor, and you should send a final draft to your second reader for comments in the first half of the quarter.

Participate in 4th Honors Thesis Writing Workshop, which will 1) facilitate giving and receiving structured, focused peer review on thesis sections where students would find feedback most helpful; and 2) provide strategies for writing effective conclusions.

Turn in final copies of your thesis to your advisor and your 2nd reader for acceptance and signatures, allowing time for formatting and printing.

Thesis Deadlines: Your honors/MS thesis is due to Richard Nevle for review on **Friday, April 30, 2021**—this is your final version, but not the bound/signed version. Your thesis advisor and second reader should have reviewed this before you submit it to Richard.

FINAL VERSION DUE FRIDAY, MAY 7, 2021: The deadline for submitting your **final thesis to Earth Systems, printed/bound copy** which includes your advisor's and second reader's approval signatures. Turn copies in to Anahid Babekian, anahids@stanford.edu. Karen Casciotti will sign off on your thesis after this final review.

Earth Systems Honors & Capstone Symposium, June 1, 2021: All honors students are expected to present a 15 minute presentation at this symposium. Please encourage your advisor, collaborators, friends, and family members to attend.

Make enough thesis copies for Earth Systems, your advisor, 2nd reader, yourself, and any other collaborators.

Please note that if you do not meet these deadlines, it is possible that your thesis may not be approved in time for graduation.

Please note: Receiving the Honors designation at graduation is dependent on you successfully completing your proposed research project and on your Honors thesis being approved by your faculty advisor, your second reader, and the Earth Systems Honors Committee. You must also maintain a minimum overall GPA of 3.4.