GUIDELINES FOR INDEPENDENT STUDY PROJECTS
Department of Earth, Environmental and Planetary Sciences
Brown University 2025-2026

Summary:
This document describes the guidelines for undertaking an Independent Study in the Department of Earth, Environmental & Planetary Sciences, which involves enrolling in EEPS 1940 (Undergraduate Research in Earth, Environmental and Planetary Sciences). This document also contains some suggestions to help students have a successful Independent Study experience. Students are encouraged to read the entire document. Please note that beginning in the 2025-2026 Academic Year, seniors working on their Senior Thesis projects should enroll in EEPS 1970 (Undergraduate Senior Thesis Course) rather than EEPS 1940.

Key Milestones for EEPS 1940:

1. No later than "the last day to add a course without a fee" (Sept. 16, 2025 in the fall and Feb. 3, 2026 in the spring), students taking EEPS 1940 must submit a 1-2-page document to both their faculty research advisor and their concentration advisor. This document should define the research question(s), describe the approach and scope of the results, and contain a rough timetable for the project, including a plan for the frequency and nature of meetings with the faculty research advisor.
2. Students taking EEPS 1940 should produce a written report by the end of the semester. In most cases, the written report will follow the format and style of regular scientific journals; however, the decision about the format of the final report is ultimately left to the student and faculty research advisor. In special circumstances, it may make more sense for the student to generate a final product that differs from a written report, such as an oral presentation or, for a student whose project is focused on teaching or science communication, a virtual field-trip, teaching module, etc.

1. Introduction:

EEPS 1940 (Undergraduate Research in Earth, Environmental and Planetary Sciences) provides an opportunity for you to experience what research in our discipline actually entails:

- to learn how to ask a well-defined, significant, and answerable question;
- to learn appropriate methods and collect your own data;
- to interpret your results and address their broader implications.

These goals are best fulfilled by hands-on experience; they cannot be learned passively in the classroom or by reading about other people's research results. A second and related goal is for you to take primary responsibility for your learning, including the necessary planning and time management.

This course will allow you to get to know some professors, staff, and grad students better than possible in typical academic courses, help you to decide whether (or not) to consider grad school and a career involving research, and provide you with skills (and a finished project) useful for job seeking.

2. Choosing a topic and advisor:

Most students choose to work on an aspect of a professor's research project. There are several advantages to such a choice. Because the overall questions and methods are already reasonably well defined, it is easier to make significant progress over the course of one or two semesters. In addition, there are usually other people (undergrads, grad students, post docs) working on related aspects of the question, making for a supportive and enjoyable working environment.

How should you choose what area (or professor) for your EEPS 1940 course?

- If you have been working in a professor's lab during the year, or a previous summer, and now would like to dig deeper and do some research of your own, talk to the professor about working together in EEPS 1940.
- If you have no previous research experience or would like to try a new research area, we suggest that you look at faculty research web pages, talk to your concentration advisor and other faculty, and talk to current seniors and grad students. Then make appointments to talk to one or two faculty members and ask them to outline one or two research projects, and to suggest relevant papers to read as background.
- It is possible to undertake a different kind of independent study. For example, if you have a strong interest and some experience in teaching, you might develop some teaching modules and/or models for a specific audience. Or if you are interested in science communication, you might develop a virtual geology field trip, or geo-themed video/podcasts (similar to SciToons). Or if you are interested in relating geoscience to a social or environmental issue, perhaps involving a co-advisor in a different department, that could be serve as a capstone project. Note that these are non-trivial undertakings; talk to your concentration advisor well in advance.

3. Procedures:

- You should plan to spend as much time every week on your 1940 course as you would on your most demanding upper-level science courses, normally ~12 hrs/week. Because research seldom goes exactly as planned, you should always have back-up work you can accomplish if faced with temporary equipment failure, etc.

- The independent study project should result in a written paper following the format and style of regular scientific journals, by the end of the semester (date to be approved by the faculty advisor). The writing of a scientific paper is an integral part of doing the research; in the process of writing, you may discover gaps in the data or completely new connections. It is crucial to allow enough time to turn in a draft of the paper, have the faculty advisor read and comment on it, and then prepare a revised version. In special circumstances, it may make more sense for the student to generate a final product that differs from a written report, such as an oral presentation or, for a student whose project is focused on teaching or science communication, a virtual field-trip, teaching module, etc.

4. Guidelines:

- Students should identify a topic and faculty advisor prior to the semester in which they propose to do the research. Professors may have limited lab space or time for undergrad research advising, and they need to plan in advance

- Early in the semester in which you are taking EEPS 1940, by the last day for drop/add, you must submit to your faculty advisor *and* your concentration advisor a one to two page proposal defining the research question, the approach (methods), the scope of the results to be obtained (e.g. how many samples analyzed, how many models run, etc.), and a rough time table (including one semester or two). The faculty advisor may wish to suggest changes in the scope or the approach, which will result in a new draft to which both the student and faculty agree.

- In consultation with your faculty advisor, develop a plan for the frequency and nature of your meetings during the semester (at least one regularly scheduled meeting per week is strongly advised), deadlines for timely completion of various portions of the work, and the nature of the final written report.

5. Advice:

- In consultation with your faculty advisor, make out a weekly "assignment" sheet for yourself at the beginning of the semester, and stick to it (or keep revising it as you learn what is realistic and feasible). Work backward from the absolute deadlines at the end of the semester (or academic year), allowing adequate time for writing and revision; you will be surprised at how little time is actually available for data gathering.

- Some projects may involve expenses for travel or supplies that are not covered by the advisor's research grant. In such cases you may be able to obtain modest funds from the department (generally <$500); consult your concentration advisor or the Director of Undergraduate Studies.

- Although it is optional, we recommend that everyone who completes an EEPS 1940 course schedule a time to present the results of their work to the department, friends, and family. Consult with your faculty advisor and concentration advisor to identify a good date, time and room.

6. Final thoughts:

Completing an independent research project can be one of the most challenging but ultimately satisfying experiences of your Brown career. At times you may be frustrated by equipment malfunctions and impatient with the pace of data collection, but when you have new results of your very own that you can interpret and relate to theories, models, predictions, or previous results – that is truly exciting!

Many students have the opportunity to present their research results in a poster or talk at a regional or national meeting (e.g. the American Geophysical Union meeting in December, the LPSC in mid-March, or the Northeast Section of the Geological Society of America). The experience of having practicing geoscientists show interest in your results, plus the opportunity

to hear talks and see posters on a wide variety of current research areas in the geosciences, can be enormously rewarding as well as useful for making contacts with potential grad school advisors and/or employers.

Note that even if you decide that you do not really enjoy hands-on research, such a realization is a very useful discovery.

Geoscience is by nature very interdisciplinary – including societally important topics such as water quality and quantity, river and coastal flooding, soil quality and erosion, natural hazards, and of course the myriad social impacts of climate change. All of these topics have enormous implications for sustainability and environmental justice. An independent project that addresses some of the links could be satisfying as well as useful in helping you to think about post-grad possibilities.