

GRADUATE PROGRAM INFORMATION

EARTH AND PLANETARY SCIENCES

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

This document summarizes university, campus, and departmental policies to assist you in planning and completing your graduate program in Earth and Planetary Sciences at UCSC. The policies described here are in effect for the 2021/22 academic year. Please be sure to visit the [UCSC Graduate Division](#) website for more details. On matters of formal requirements, the [General Catalog](#) is authoritative. Further information on institutional requirements for graduate students may be found at the Graduate Division's [Academic Regulations](#) page.

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Principles of Community

The department is committed to creating a welcoming environment for all members of our community. We have adopted [Principles of Community](#) to help develop and maintain an inclusive climate where all department members can grow professionally and bring their whole selves to Earth and Planetary Sciences. All department members should read the Principles of Community and follow the expectations during all interactions with other members of the department and at all department-sponsored events.

We encourage anyone who experiences or witnesses potential violations of our Principles of Community to file a report. Options for reporting are [outlined here](#).

Personnel and Administrative Structure

Primary Academic Advisor

All students must have a Primary Academic Advisor (also called Faculty Advisor or PI), who is usually a faculty member or researcher at UCSC. In some cases students are formally co-advised by two UCSC advisors or conduct projects with multiple people within an area (e.g. the seismology group or planetary science group). Students with a main advisor outside of UCSC, such as at the US Geological Survey or other local agency, must have a faculty member from Earth and Planetary Sciences as co-advisor.

The Primary Academic Advisor agrees to take responsibility for an incoming graduate student at admission. This generally involves having made a financial commitment, but it is most important for providing research guidance and helping with selecting courses, securing fellowships, writing proposals, providing career advice, and other mentoring tasks. Success as a graduate student depends to a large extent on maintaining a positive relationship, including clear communication, between student and Primary Academic Advisor. All students and advisors will discuss mentoring during the Initial Advising Session (more details below); this Mentor-Mentee Expectations document will set out shared guidelines for a productive relationship. The Faculty Graduate Representative and/or Staff Graduate Advisor can help advise in case of challenges or conflict in the mentor-mentee relationship (see section below on Navigating Mentor-Mentee Conflict for more details).

It is possible to switch Primary Academic Advisors in cases of shifting research focus or if it becomes impossible to maintain a working relationship. Note that all students must have a Primary Academic Advisor to remain in good academic standing. However, switching advisors is not easy because it requires finding a new Primary Academic Advisor with sufficient subject-matter knowledge and the ability to provide financial support. If a switch is necessary because of irreconcilable differences in the mentoring relationship, the department can provide one quarter of bridge funding (academic-year or summer, as a TAship or GSR, depending on funding availability and department needs) to help facilitate the transition to a new Primary Academic Advisor. Consult with the Faculty Graduate Representative and/or Staff Graduate Advisor for questions about switching Primary Academic Advisor.

Department Personnel

Here are a few of the people in the department with whom you should become familiar as soon as possible, if you have not done so already. If you have questions or needs related to your graduate program and can not find answers online or in other materials, these are some of the folks to contact for guidance. There are many other people who can be helpful and are responsible for other aspects of departmental resources and policies, many of whom will be

introduced during the Orientation Meeting. Please visit the [department web site](#) for a complete list of personnel and their contact information.

The Staff Graduate Advisor (Jennifer Fish, jmsfish@ucsc.edu, EMS A251, 831-459-1235) is the first person to contact with questions about administrative issues and forms, financial matters, class enrollment, program requirements, and related topics.

The Faculty Graduate Representative (Noah Finnegan, nfinnega@ucsc.edu, EMS A115, 831-459-5110) represents the department in matters of academic and degree policy, approves course plans and committees, advises in cases of unsatisfactory academic progress or mentor-mentee conflict, and helps solve problems under unusual circumstances.

The Department Chair (Matthew Clapham, mclapham@ucsc.edu, EMS A208, 831-459-1276) deals with department-wide matters and can advocate for department issues with the administration and Academic Senate.

The Department Manager (Lisa Stipanovich, lms@ucsc.edu, EMS A233, 831-459-4478) manages the front office staff and is also well versed in departmental and university practices.

The Department Assistant (Amy Kornberg, amykorn@ucsc.edu, EMS A232A, 831-459-4137) assists with front office activities such as class scheduling, personnel appointments, A/V equipment, copying, mail, and shipping.

UCSC Administrative Structure

Policies affecting graduate students are developed at multiple levels within UCSC and at the system-wide University of California level. UCSC operates under a system of shared governance where priorities and policies are jointly set by the Administration and the faculty Academic Senate.

The Earth and Planetary Sciences department is part of the Division of Physical & Biological Sciences, which is one of five academic divisions and part of the administration. Most relevant to graduate policy, the division allocates TAs to the department using a formula based primarily on undergraduate course enrollments. The Graduate Division (graddiv.ucsc.edu) is another part of the administration, headed by the Vice Provost and Dean of Graduate Studies (VPDGS). The Graduate Division enforces policy and approves petitions, provides block funding that we use for Regents' Fellowships to first-year students (calculated based on our graduate student numbers and yield of accepted offers), and offers professional development programs, among other things. At the highest level, the Chancellor and the Campus Provost and Executive Vice Chancellor (CP/EVC) guide overall strategy, set campus priorities, and make budgetary decisions.

For graduate students, the most relevant committee of the Academic Senate is the Graduate Council. The Graduate Council coordinates all academic policies and procedures affecting graduate study, approves changes to graduate program requirements, and considers student petitions and academic appeals. This committee is also able to advocate to the administration on topics that would improve the graduate student experience. Like some other committees, Graduate Council includes graduate student representatives, nominated by the Graduate Student Association (see Department Leadership Opportunities section for more information).

All issues about academic student employees (ASEs, including teaching assistants) are bargained at a systemwide level between the UC Office of the President (UCOP) and the United Auto Workers union.

Program Learning Outcomes

Graduates from the Ph.D. program should have acquired the following skills and knowledge:

- Detailed knowledge of the fundamentals and current topics in the research area
- Ability to present research findings in written format suitable for a scientific journal
- Ability to communicate scientific concepts and results in oral presentations to subject-matter specialists and to a general Earth science audience
- Ability to conduct independent research, including developing new research questions

Graduates from the thesis-based M.S. program should have acquired the following skills and knowledge:

- Knowledge of the fundamentals and current topics in the research area
- Ability to present research findings in written format suitable for a scientific journal
- Ability to communicate scientific concepts and results in oral presentations to subject-matter specialists and to a general Earth science audience
- Ability to conduct independent research

Coursework Requirements

Requirements for Graduation

All graduate students (except those in the coursework M.S. program) must enroll in EART 203, **Introductory Teaching Seminar** (1 unit), fall quarter of their first year. The following required courses for the standard curriculum should also be taken in the first year: EART 204, **Fundamentals of Earth and Planetary Sciences** (5 units, fall quarter), and EART 206, **Great Papers in Earth and Planetary Sciences** (5 units, winter quarter).

You are also required to take at least one subject course focusing on specific EPS content and one analytic course focusing on a method. Both courses must be formal courses based on lectures with graded assignments. Courses within the department must be at the graduate level; courses outside the department can satisfy if they are taught at a level higher than that required of our undergrad majors. A set of appropriate courses for each requirement is in the table below. This list is *not* exhaustive and tends to change over time. *Please use this list as a starting point, and make sure you consult the course catalog and primary faculty advisor to determine other possibilities that might be appropriate for your study plan. A final decision on appropriate courses will be reached in the advising session (see below). The approved course plan is authoritative on requirements.* Please note that you must take at least two distinct courses for these requirements.

Examples of Courses Meeting the Department Requirements

Subject Courses	Analytic Courses
<p>EART 207. Tectonics EART 208. Methods in Paleoclimatology [not currently offered] EART 209. Solid Earth Geochemistry [not currently offered] EART 210. Overview of Stellar and Planetary Formation and Evolution EART 213. Biogeochemical Cycles EART 220. Ground Water Modeling EART 231. Igneous Petrology [not currently offered] EART 254. The Climate System EART 258. Deep Time Paleoclimate EART 262. Planetary Interiors EART 263. Planetary Surfaces EART 264. Planetary Atmospheres EART 270. Global Seismology EART 272. Geophysical Fluid Dynamics</p>	<p>EART 225. Statistics and Data Analysis in the Geosciences EART 229. Isotopic Methods in Environmental Science EART 265. Order of Magnitude Estimation EART 266. Geological Signal Processing Any math methods course at a level higher than multivariable calculus. Common AMS, Math and Physics choices are included below. AMS 100. Mathematical Methods for Engineers III AMS 132. Statistical Inference AMS 147. Computational Methods and Applications AMS 206. Bayesian Statistics AMS 211. Foundations of Applied Mathematics AMS 215. Stochastic Modeling in Biology AMS 245. Spatial Statistics ASTRO 235. Numerical Techniques ASTRO 260. Instrumentation for Astronomy CHEM 122. Principles of Instrumental Analysis [Note: this course is very difficult to get into] CHEM 246C. Computers and Information Processing in Chemistry BIOE 286. Experimental Design and Data Analysis ENVS 215A/L. Geographic Information Systems and Environmental Applications MATH 106. Systems of Ordinary Differential Equations MATH 107. Partial Differential Equations OCEA 215. Predicting the Atmosphere, Ocean, and Climate OCEA 260. Introductory Data Analysis in the Ocean</p>

	and Earth Sciences (also listed as EART-260) PHYS 116ABC. Mathematical Methods in Physics PHYS 160. Practical Electronics PHYS 242. Computational Physics PHYS 250. Mathematical Methods
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Other course requirements are tailored to the individual student's academic background, professional experience, and plans for research (see course plan advising session below). Research Master's degree students must take a minimum of 35 units of graduate and upper-division undergraduate courses, (including the courses mentioned above), of which no more than 15 units may be upper-division undergraduate courses. Of the required graduate-level courses, a minimum of 20 units must be courses other than supervised research (EART 297 or EART299) except by special exception of the Graduate Council. There is no minimum course unit requirement (except the courses mentioned above) for Ph.D. degrees, but students generally take more courses during the first year or two in the department. Students entering with a Bachelor's degree usually need to broaden their background by taking additional courses in areas of undergraduate deficiency or in areas related to thesis research interests, whereas students entering with an M.S. may be more focused on acquiring specific research skills. Additional courses in the sciences may also be helpful. During the first year, students typically take three 5-unit courses per quarter or two courses and one 5-unit independent study associated with their research. You should prepare a course plan for your first year as soon as possible with your Primary Academic Advisor. Also, be sure to discuss with your advisor how your independent research (EART 297 or EART299) progress will be evaluated, so that there will be no misunderstandings at the end of the quarter. It is a good idea to agree on specific goals in writing, and to meet periodically to assess progress throughout the quarter.

Earth and Planetary Sciences students occasionally take courses at another campus and transfer them for credit to UCSC, although usually not in their first year. Such a course must fill a clearly defined need in your academic plan and contain material unobtainable at UCSC, and you will need departmental approval in advance. Generally no more than three such courses will be approved per graduate student per year.

Graduate students are also required to enroll in and attend **EART 293, Graduate Research Seminar** (1 unit), in spring quarter each year. During each seminar, 2-3 graduate students (generally in their 2nd, 4th, and occasionally 6th year) give oral presentations on current or anticipated research and are critiqued by their peers (for both content and presentation). The primary purpose of this seminar is to give students practice in presenting research results. Students should prepare carefully and practice for these seminars. UCSC Earth and Planetary Sciences graduate students have received a large number of awards for presentations at national and international meetings, and we think the EART 293 course has helped contribute to this. In

addition, it helps keep the entire department aware of what kinds of research projects are planned or underway.

Graduate students are expected to enroll quarterly and attend the weekly **EART 292-01, Whole Earth Seminar** (Tuesdays at 3:30pm). You should also consider the more specialized seminar, **EART 292-02, EPS/IGPP Seminar** (Fridays at 12:00pm), for at least your first year. These seminars are coordinated by faculty and graduate students to bring researchers from other institutions and organizations to give talks and interact informally with Earth and Planetary Sciences students, researchers, faculty and staff. In addition, most visitors are happy to meet with interested students. Be sure to contact the seminar host if you are interested in meeting with a speaker, and tell the organizers if you know of excellent speakers we should bring to give a talk.

Enrolling in Courses

All students should enroll in at least 15 units each quarter to maintain full-time status. These units are obtained through a mixture of courses (courses typically are 5 units, except for EART203 and EART293) and independent research credits. If the total units from courses is less than 15, students should enroll in 5, 10, or 15 units of independent research to reach at least 15 units. Pre-candidacy Ph.D. students and M.S. students should enroll in EART297 (Independent Study) and post-candidacy Ph.D. students should enroll in EART299 (Thesis Research). Each Primary Academic Advisor has a different section of EART297 and EART299; the class numbers will be provided by the Staff Graduate Advisor each quarter.

Students enroll in classes online through their UCSC Student Portal my.ucsc.edu before the published deadline for each quarter (see the Academic and Administrative Calendar at <https://registrar.ucsc.edu/calendar/academiccalendar.html>). No credit can be earned for courses in which they do not officially enroll. Their registration may be cancelled or fee credits put on hold if they fail to enroll in classes by the published deadline. A \$50 late enrollment fee is assessed if students have not enrolled by the 7th day of instruction in any quarter. If they are a teaching assistant (TA) or a graduate student researcher (GSR) and fail to enroll in classes, their employment with the University will be terminated. If students have not enrolled in at least 5 units by the 1st day of the quarter, a hold will be put on their financial aid (TA or GSR fee credits, fellowships, loans, etc). For enrollment help, contact the Staff Graduate Advisor, or the Registrar at registrar@ucsc.edu or (831) 459-4412.

Degree Milestones and Requirements

Time to Degree

The length of time spent in graduate school varies from student to student, but the department and Graduate Division have clear expectations. It generally takes four to six years to complete a Ph.D., and two to three years to complete a research M.S. The coursework M.S. degree is generally completed in one year. If UCSC graduate students in the physical sciences take more than six years to complete a Ph.D. or more than three years to complete a research M.S., there can be negative impacts for the student and department, including loss of funding. Exceptional circumstances sometimes result in significant changes to degree plans and timing; please consult regularly with your Primary Academic Advisor (and others, as described below) to make sure your graduate plan remains on schedule.

Most graduate students discuss potential research topics with their future advisor(s) before they apply for admission, and these discussions should continue and intensify during your first year. A complete research plan will include the scope, logistics, funding, and intended products (thesis, reports, papers) of planned and potential research. These discussions should result in the student formalizing plans for research, including identification of a major advisor who will supervise the project(s). In the following sections, we describe additional requirements and milestones for the main degree types: Ph.D., M.S., and coursework M.S.

Initial Advising Session and Course Plans

Just before your first quarter, you will meet with your Primary Academic Advisor to create a Course Plan. This plan should include all of the graduate requirements discussed above in addition to any more specialized courses required by your background and research interests. This is a very good time to take a close look at your education to date and identify any gaps that should be filled. Useful questions to ask yourself and your advisor are: (1) Do you have at least as much grounding in the fundamentals of the field as a graduating senior in this department? (This is a particularly important question if your undergraduate degree was not in a geoscience field). (2) Do you have sufficient breadth to follow a well-presented departmental research seminar? (3) Do you have sufficient specialized knowledge to pursue your planned research?

You and your Primary Academic Advisor should also complete the Mentor-Mentee Expectations checklist. This document will help guide you and your academic advisor in a discussion about expectations for the mentoring relationship. For each prompt, you should share your opinions and attempt to come to an agreement about the expectations for mentor and for mentee. In some cases, you may not be able to reach consensus, but you should attempt to understand the other person's expectations. Write a summary outlining your shared expectations in response to each prompt below, and submit it to the Staff Graduate Advisor prior to the Initial Advising Session.

Once you and your Primary Academic Advisor have constructed a course plan and discussed mentoring expectations, you and your Primary Academic Advisor will meet with the Faculty Graduate Representative to review the plan. The purpose of this meeting is to ensure that you begin the first quarter with a realistic course plan that will help you meet your academic goals, and a mentoring plan to create a good working relationship. Once a course plan is approved, these courses then become requirements to be completed prior to your qualifying exam or Masters degree completion. You may, of course, choose to take additional courses as your interests and expertise evolves. However, you may not omit any of the courses from your approved course plan without approval from the Faculty Graduate Representative. Your course plan will be reviewed once a year while preparing your progress report. If there are significant changes in your research direction, that is a natural time to make any appropriate adjustments to the course plan, although mid-year adjustments are certainly possible.

Ph.D. Research, Reading Committee, and Dissertation Requirements

Oral Qualifying Examination and Advancement to Ph.D. Candidacy

Qualifying Exam Goals and Philosophy

The qualifying exam is intended to evaluate whether a student has the necessary preparation to successfully complete the Ph.D. research and continue to make contributions to the field as an independent researcher after moving on from UCSC. This involves an assessment of:

1. The strength of foundational knowledge and skills relevant to the subdiscipline
2. The quality of initial research at UCSC as an indicator of potential for future success
3. The feasibility and potential impact of the proposed research

The process involves two components: a written proposal and an oral exam. The written proposal will demonstrate your initial research progress, the creativity and potential impact of your scientific ideas, and the quality of your planned work. The oral exam will explore the depth of your foundational knowledge relevant to the proposal and will probe more deeply into the details of your research plan, including the choice of methods and implications of possible findings.

Although the qualifying exam serves an assessment function, we also view it as a collaborative endeavor to help you sharpen your research plan. The discussion will gauge your knowledge and preparation, but will also help you explore potential directions for and implications of your research. The exam is intended to push the boundaries of your knowledge, so there likely will be questions that you cannot answer. By probing the edges of knowledge, the discussion aims to examine how you can reason through an unsolved problem, and will identify areas to strengthen in order to increase the success of your research. The process of writing the proposal and preparing for the exam also focuses your thoughts and deepens your understanding.

Normative Time for the Qualifying Exam

In order to qualify for candidacy in any doctoral program of the Division of Graduate Studies at the University of California, a graduate student must pass a qualifying examination within three years of entering the Ph.D. Program. The normative time to take the Qualifying Exam in the UCSC Earth and Planetary Sciences Department is by the end of winter quarter of the third year for students entering with a Bachelor's degree (second year if entering with a Masters degree).

Qualifying Exam Committee

In the fall of the year of qualifying (or four-six months prior to the anticipated exam date), each Ph.D. student should choose a faculty member to chair the Qualifying Exam committee. In the EPS department, this person is generally the Primary Academic Advisor. University regulations require that the chair be a tenured professor at UCSC, so if your primary advisor is currently untenured, you and your advisor will need to select an additional faculty member to be the chair. Together the advisor and student select additional members of the examining committee. Most committees should be composed of three members from the Earth and Planetary Sciences faculty or affiliated faculty, and one outside member. The outside member may be a tenured professor (pre-tenure with approval by exception) from another UCSC department or from another institution in a field related to the Earth sciences. Any non-Academic Senate faculty member or professional from a non-academic institution (e.g., U.S. Geological Survey) must be approved by exception following submission of the proposed member's C.V. to the Dean of Graduate Studies. If additional committee members are desired, the balance of the committee (at least 50%) is generally EPS faculty.

The committee must be approved by the Faculty Graduate Representative and Graduate Dean, at least 30 days prior to the exam date. Approval also requires a scheduled date and location, so it is the student's responsibility to coordinate a time for the committee. The student should plan sufficiently in advance, especially if the outside member is not a UCSC faculty and requires additional approval, so that the Faculty Graduate Representative and Graduate Dean can approve the form. The appropriate form to nominate members of the Qualifying Exam committee can be obtained from the Staff Graduate Advisor or on the [Graduate Division's website](#). Once completed, please return the form to the Staff Graduate Advisor who will forward it to the Graduate Division.

Research Proposal

The research proposal should be a proposal of no more than 30 pages (single-spaced, font size no smaller than 11 points, 1 inch margins), inclusive of figures, tables, and references. The proposal should present a compelling and significant overarching research question typically with three specific scientific problems to be addressed; provide sufficient background to motivate the

proposed research and identify key knowledge gaps; describe the approaches and methods used to achieve the goals, including a presentation of preliminary results; and outline a proposed timeline with specific milestones and funding plan. Dissertation work that has been submitted to a publication prior to the qualifying exam (in review, accepted, or published work) can be included as an appendix that does not count against the length limit.

Prior to starting the proposal, you should discuss the expected scope of the research with your advisor to determine the norm for your discipline, including the breadth of individual projects within the proposal. The proposal will normally describe three chapters of work, but the topics in those chapters may be more focused or more disparate, depending on the discipline. It is normal for advisors to provide feedback and editing, often with multiple iterations, prior to distributing the proposal to the committee. You should give a draft of your proposal to your committee at least two weeks before the exam date, and ideally earlier, to allow time for the members to read the draft and for you to meet with them to discuss the planned topics for questions.

Proposals to be considered for the Waters Award (see below) must be submitted within two weeks after the qualifying exam, and can be revised in that time on the basis of feedback provided at the exam.

Oral Exam

The oral exam is typically 2-3 hours long, with the following components: 1) welcome and introductions; 2) sharing of background information by the advisor with the committee while the student is outside of the room; 3) the body of the exam; 4) discussion of the recommendation among the committee with the student outside of the room; 5) discussion between committee and student to share the recommendation and the next steps.

The body of the exam is divided into questions on fundamental knowledge or skills, presentation of the research plan by the student, and questions about the specific research plan (methods, expectations, and implications). At times, questions about the specific research plan will lead to additional discussion of fundamental knowledge. The exact subject areas and questions will differ depending on the project and the composition of the committee. You should meet with each of your committee members after sending them the proposal, but prior to the exam, to discuss the topics or subject areas that their questions may cover. Additional topics may arise during the course of the exam as the subject is discussed. The committee should also coordinate among themselves to ensure a suitable coverage of questions on both fundamental knowledge and about the research plan.

Students should prepare a presentation to describe their proposed work to the committee. The presentation should describe the overarching motivation of the project; the goals, methods, and

any preliminary data for the individual chapters; and the expected significance and implications of the research. You should plan for a 20-30 minute presentation, but it is typical for the committee to interject with questions during the presentation.

Qualifying Exam Feedback

The committee will provide verbal feedback at the end of the exam, along with the recommendation. The possible recommendations are *pass* or *fail (retake)*. If the committee recommends a retake of the exam, you should discuss the timeline with your advisor after receiving the written feedback. Written feedback will be compiled by the committee chair, in discussion with all committee members, and will summarize strengths and weaknesses in the following categories: fundamental knowledge and skills, research accomplishments and plans, and capacity to achieve the research goals. This written feedback will be provided to the student within one week of the exam.

The official report is also filed with the department and with the Graduate Division, accompanied by an approved Reading Committee Form upon successful completion of the exam and a \$90 direct deduction from the student's account to cover the processing fee for advancement to candidacy. The Qualifying Examination may be taken no more than twice, and if retaking the exam is necessary it should be done within no more than one quarter after the first attempt, and within less than 3 years of entry to the program. Exam committee membership cannot be changed between the first and second exams without specific permission of the Graduate Dean.

Post-Qualifying: Completing an Individual Development Plan

After advancing to candidacy, students should plan for completion of their dissertation research and set the groundwork for future career paths. Career preparation may involve building skills or gaining experience in specific fields within or outside of academia. To help identify potential career paths and preparatory steps, students should complete an individual development plan (<http://myidp.sciencecareers.org>) and outline the specific skills or experiences they want to gain before completing the Ph.D.. After completing the IDP, students should meet with their Primary Academic Advisor to discuss strategies for implementing the career preparation plan.

Waters Award

The department's Aaron and Elizabeth Waters Award honors the graduate student whose Qualifying Exam proposal is judged to be the most outstanding. Proposals are judged annually by the graduate awards committee, typically in the spring quarter for anyone qualifying within normative time during the previous calendar year. The committee may select a single meritorious proposal, or the award may be shared among several candidates.

The award is made for the written proposal, not the Qualifying Exam presentation, and the best proposals are cogent explanations of potentially transformational Ph.D. research plans and projects. The proposals will be judged on a combination of: (1) the clarity of the writing and overall presentation, including convincing motivation for research and lucid explanation of research methods, (2) the scientific rigor, maturity, and completeness of the argumentation, including incorporation of preliminary results and/or situation of the problem in the relevant research field as appropriate and (3) the potential scientific impact of the proposed work within and beyond its discipline.

In order to be eligible for consideration for the Waters Award, students with a Bachelor's degree must successfully pass their oral Qualifying Exam by the end of winter quarter of the third year (i.e. by the end of their 8th quarter, excluding summers), and those with a Masters degree in the same field by the end of winter quarter of the second year (i.e. by the end of their 5th quarter). Proposals must be submitted to Jennifer Fish and received no later than 2 weeks after the qualifying exam date. It is expected that students will normally solicit and incorporate edits from their advisors and committee both before and after the exam. The proposal length is limited to no more than 30 pages, inclusive of figures, tables, and references. Submitted papers may be included as appendices and do not count towards the page limit.

Ph.D. Dissertation Reading Committee

At the time of advancement to candidacy, students must submit a Reading Committee Form to the Graduate Division. This form lists the names of the faculty who will sign the original dissertation title page when it is complete. The Reading Committee consists of at least three individuals, the majority of whom must be members of the Santa Cruz Division of the Academic Senate (which, for EPS Department members, are ladder-rank faculty). The reading committee often includes some or all of the same people who administered the oral qualifying exam, but this is not required. The Faculty Graduate Representative must approve and sign the Reading Committee Form. Once this form is submitted, membership can only be changed by submitting a revised Reading Committee Form for the Graduate Dean's approval. **The Reading Committee Form must be turned in with the qualifying exam report and the \$90 account deduction for the Advancement to Candidacy fee before "Advanced to Candidacy" status is official.**

Once advanced to candidacy, students are required to meet with their Reading Committee at least once each year. External members from other institutions that may find attendance difficult are not required to be present for these annual Reading Committee meetings, but getting regular input from the entire committee is often beneficial. The purpose of this meeting is to allow students and their committees to discuss preliminary research results, re-examine project goals, and verify that the student remains on track and on schedule. A funding plan for the remainder of the research project should also be discussed. The chair of the Reading Committee (the Primary

Academic Advisor) is required to submit a written report concerning research progress to the Faculty Graduate Representative in the spring; this report forms the basis for the annual department review of academic progress, which is submitted to the Graduate Division.

Dissertation: Completion and Defense

The Ph.D. dissertation is a scholarly contribution to knowledge, which embodies the results of original and creative effort by the student. The final evaluation is completed by the Reading Committee. The dissertation must be written explicitly in accordance with "Instructions for Theses and Dissertations" prescribed by the Graduate Division. It must be submitted within the normative time requirements for the Ph.D. degree. Students are urged to prepare their dissertations, or certain chapters in them, in a form that is suitable for publication. This places emphasis on succinctness and clarity, with much of the analytical and descriptive data placed in additional chapters or appendices.

Students must present a complete draft of their dissertation to their committee by the fourth week of the quarter in which they wish to graduate. Thus, a minimum of six weeks is allowed for faculty evaluation, revision, and a defense seminar, which must be scheduled and publicized at least two weeks in advance. This is a public departmental seminar, with additional questions asked by the dissertation committee in a separate session afterwards, followed by a celebration with the successful candidate.

M.S. Research, Reading Committee, and Thesis Requirements

Like Ph.D. students, M.S. students should work with their Primary Academic Advisor as soon as possible to develop a research plan. Once a preliminary plan is in place, each M.S. student should set up a research (reading) committee comprising the Primary Academic Advisor plus at least two additional members. One of these committee members may be from outside the department (typically having a professional rank equivalent to a faculty member), but the majority of committee members must be members of the Santa Cruz Division of the Academic Senate. M.S. students are required to submit a Reading Committee Form to the Graduate Division by the end of the second week of the quarter in which the degree is to be granted, indicating proposed membership of the committee. The committee will meet with the student at least once per year to discuss research plans and progress; a report on these topics must be submitted to the Faculty Graduate Representative by the Primary Academic Advisor once per year. A complete M.S. thesis (meeting format requirements specified by the Graduate Division) should be submitted to the reading committee by early in the final quarter of work, generally spring of the second year in the department. There is no formal requirement that M.S. students "defend" their thesis research as part of a seminar open to the public.

Coursework M.S. Degree

The coursework M.S. degree is a terminal professional degree, intended to allow students to increase their breadth, quantitative depth, or emphasis on a particular specialty; to provide the student with a stronger background toward competition for jobs or an enhancement of skills for current employment (e.g. K-12 teaching); or to allow students from other disciplines (e.g. biology, physics, chemistry, math, environmental studies) to acquire advanced training in Earth and planetary sciences. Transcripts are annotated with “Master of Science by Coursework,” in contrast to the “Master of Science by Thesis.” Students will be required to complete nine 5-unit courses, normally within three quarters, for this degree. Coursework M.S. students with work or other obligations may require a longer time to complete the nine courses. These courses should be at the graduate or upper-division undergraduate level. No more than 15 units may be upper-division undergraduate courses, and no more than 5 units may be independent research or internships (EART297, 298, or 299). The department generally discourages coursework M.S. students from taking graduate seminars (EART290_) as part of the nine-course requirement.

Courses to be taken will be chosen on the basis of student’s interests, in consultation with a Primary Academic Advisor, and with approval of the Faculty Graduate Representative. Just before your first quarter, you will meet with your Primary Academic Advisor to create a Course Plan. Once you and your Primary Academic Advisor have constructed a plan, you and your Primary Academic Advisor will meet with the Faculty Graduate Representative to review the plan. The purpose of this meeting is to ensure that you begin the first quarter with a realistic Course Plan that will help you meet your academic goals. Any revisions to the original course plan must be formally submitted and approved by the Primary Academic Advisor and the Faculty Graduate Representative. Coursework M.S. students are required to fulfill one of the following capstone options: a substantial review/research manuscript, or a comprehensive oral examination based on their course work.

Switching Degree Tracks

Students who are interested in switching degree tracks should first discuss their options with their Primary Academic Advisor. It is possible to switch from coursework M.S. to thesis M.S., thesis M.S. to Ph.D., or Ph.D. to M.S (thesis or coursework). With approval of the Primary Academic Advisor, students should contact the Staff Graduate Advisor to initiate the paperwork for a Petition for Transfer of Graduate Program, which is submitted to the Graduate Division to finalize the change.

Satisfactory Academic Progress

Satisfactory academic progress is demonstrated by successful completion of required coursework and progress toward research objectives. Students must earn Satisfactory (S) grades for courses taken with the Satisfactory/Unsatisfactory grading option, or B or higher grades for courses taken with the letter grade option. You should discuss expectations for independent research credits

(EART 297 or EART 299) with your advisor prior to each quarter, developing a written plan with specific milestones and achievements.

Students who fail to earn a satisfactory (S, or B or higher) grade in any class, including Independent Study (EART297) or Thesis Research (EART299), must meet with the Faculty Graduate Representative and their Primary Academic Advisor to discuss strategies for success in the graduate program and to develop clear milestones for satisfactory progress in the next quarter. Unsatisfactory progress in any subsequent quarter will lead to students being placed on academic probation. If you are placed on academic probation, you will receive a letter clearly stating the grounds for probation and the conditions for returning to good academic standing. If these conditions are not met, you will be dismissed from the program.

Students in the Ph.D. program must complete the qualifying exam before the end of their 4th year, or may be placed on academic probation for unsatisfactory progress until completing the exam.

After qualifying, students in the Ph.D. program are expected to complete the dissertation within three years, or may be placed on academic probation for up to one year. Students in the research M.S. program are expected to complete the thesis within three years, or may be placed on academic probation for up to one year.

Annual Progress Report

Graduate students are evaluated annually to assess academic progress by completing an approved Progress Report form, and the results of these reports are forwarded to the Graduate Division near the end of spring quarter. The annual progress report includes a self-assessment of your accomplishments over the previous year and goals for the coming year, a review of progress towards the coursework requirements on your initial course plan (for M.S. and pre-candidacy Ph.D. students only), a plan for funding sources and TAship need during the coming year, and a list of preferred courses for TA assignment.

M.S. and pre-candidacy Ph.D. students should discuss the progress report with their Primary Academic Advisor; Ph.D. students who have advanced to candidacy should schedule a meeting of their Reading Committee to discuss research milestones and the progress report. All students should also review their Mentor/Mentee Expectations document with their Primary Academic Advisor, discussing any topics that need to be updated due to changing circumstances or on the basis of experience from the previous year.

The progress report also contains an assessment of overall progress toward the degree. This assessment is made primarily by the Primary Academic Advisor (in consultation with the student's Reading Committee, if the latter has been constituted) on the basis of coursework, research progress, and the Mentor/Mentee Expectations. Graduate students in Earth and Planetary Sciences must demonstrate satisfactory progress to ensure good academic standing. Students whose progress is judged to be unsatisfactory must meet with the Faculty Graduate Representative and their Primary Academic Advisor to discuss strategies for success in the graduate program and to develop clear milestones for satisfactory progress over the summer. Failure to achieve the milestones over the summer is considered to be further unsatisfactory progress and will result in placement on academic probation. Students who are placed on academic probation will receive a letter clearly stating the grounds for probation and the conditions for returning to good academic standing. Failure to meet these conditions will result in dismissal from the program.

Please review the latest version of the [UCSC Graduate Student Handbook](#) for more information.

Responsibilities of the Primary Academic Advisor

Each student has a Primary Academic Advisor who serves as their principal mentor. The Primary Academic Advisor is responsible for providing sufficient funding (unless the student was admitted with an unfunded offer), helping guide the research from conceptualization to completion, and supporting the student's professional development and career preparation.

Many aspects of the student-advisor relationship will be outlined in the Mentor/Mentee Expectations document that is created for the Initial Advising Session and revised annually during the progress report meeting. If the Primary Academic Advisor is not meeting those expectations (for example, not providing timely feedback or not supporting professional development activities), and the issues have not been resolved through discussion (see section on Navigating Mentor-Mentee Conflicts below), students should involve the Staff Graduate Advisor, Faculty Graduate Representative, or Department Chair in case of conflict of interest. If you feel more comfortable dealing with someone outside of the department, the [Conflict Resolution Office](#) provides consultation and, if desired, mediation.

Navigating Mentor-Mentee Conflicts

Sometimes the mentor-mentee relationship may encounter challenges, and potentially even serious issues. You may be able to resolve lower-level concerns by discussing them directly with your Primary Academic Advisor. For topics addressed by the Mentor-Mentee Expectations document, reviewing that agreement may facilitate the discussion. It is helpful to document the outcome of the discussion in writing, such as via email after the meeting.

If an issue continues or recurs after the discussion, or if you are unable to get a response or schedule a meeting with your advisor, you should reach out to the Faculty Graduate Representative and/or Staff Graduate Advisor. You can copy the Faculty Graduate Representative on email discussions or request that they schedule a meeting with you and your Primary Academic Advisor to discuss a solution to the concerns.

If you feel that the Faculty Graduate Representative may have a conflict of interest, or if your Primary Academic Advisor is also the Faculty Graduate Representative, the Staff Graduate Advisor and/or Department Chair are available to help you resolve the issue.

For more serious or urgent concerns, you may wish to go directly to the Faculty Graduate Representative, Staff Graduate Advisor, and/or Department Chair. Potential violations of our Principles of Community, or of the Faculty Code of Conduct or federal laws such as Title IX, should be reported to the relevant group (link to reporting options provided above).

In all situations, if you feel more comfortable dealing with someone outside of the department, the [Conflict Resolution Office](#) provides consultation and, if desired, mediation. The [Ombuds Office](#) also has a list of campus resources.

Financial Support

Types of Support

During the academic year (fall, winter, and spring quarters), funding typically comes from Graduate Student Researcher (GSR); Teaching Assistant (TA); internal UCSC fellowships such as the Regents', Chancellor's, Cota-Robles, or Dissertation Year/Quarter; or outside fellowships. During the summer quarter, funding typically comes from GSR support or, for first-year students, UCSC Regents' Fellowship.

For GSR or TA appointments, you should sign up for direct deposit through UCPATH (<https://ucpath.ucsc.edu/>) once you have completed your hire paperwork with the Academic Personnel office. UCPATH is the payroll system used to process your paychecks for GSR and TA appointments (FAQ: <https://ucpath.ucsc.edu/documents/academic-students-faq-flyer.pdf>).

Graduate Student Researcher (GSR) Support

A Graduate Student Researcher (GSR) is a full-time registered UCSC graduate student appointed to assist in performing research under the direction of a ladder-rank faculty member or

authorized Principal Investigator. GSR stipends are paid from funds, typically research grants, obtained by your Primary Academic Advisor.

M.S. students and Ph.D. students prior to completing the Qualifying Exam are supported at GSR Step 7. After advancing to candidacy, Ph.D. students receive GSR step 8. During the academic year, GSR appointments are 50% time (49.99%) positions, corresponding to a pre-tax monthly stipend of \$2854 (GSR 7) and \$3081 (GSR 8) for 2021/22. A 50% appointment means that you can spend no more than 20 hours per week assisting with research tasks that are not part of your thesis or dissertation research. During the summer quarter, GSR appointments can be higher than 50% time, and are often 75% or 100% GSR positions in the EPS department. You should discuss summer funding with your Primary Academic Advisor.

GSR paychecks are issued on the 1st of the month following the month worked: fall quarter checks are issued November 1, December 1, and January 1; winter quarter checks are issued February 1, March 1, and April 1; spring quarter checks are issued May 1, June 1, and July 1; and summer quarter checks are issued August 1, September 1, and October 1.

Federal and state taxes are withheld from GSR stipends.

When appointed as a GSR, you also receive full tuition and fee remission, including non-resident tuition (if applicable) and health coverage (GSHIP, Graduate Student Health Insurance Program), paid by your advisor's research funds. In the first year, non-resident tuition is paid for by your advisors. International doctoral students receive the International Doctoral Recruitment Fellowship to pay non-resident tuition in years 2 and 3, and non-resident tuition is waived for international students after advancing to candidacy.

Teaching Assistant (TA) Support

A Teaching Assistant is a registered graduate student in full-time residence, chosen for excellent scholarship and for promise as a teacher, and serving an apprenticeship under the active tutelage and supervision of a regular faculty member. As a TA, you will typically be responsible for leading lab or discussion sections, grading student work, and other related duties.

TAships are assigned based primarily on curricular needs, but where possible also on the funding needs of graduate students and desired assignments of potential TAs. Ph.D. students receive highest priority for TAships, followed by M.S. students. Each summer, the Faculty Graduate Representative and Staff Graduate Advisor review requests for TAships, along with the academic background of potential TAs, to assign students to courses.

TA paychecks are issued on the 1st of the month following the month worked: fall quarter checks are issued November 1, December 1, and January 1; winter quarter checks are issued February 1, March 1, and April 1; and spring quarter checks are issued May 1, June 1, and July 1.

Federal and state taxes are withheld from TA stipends.

When appointed as a TA, you also receive full tuition and fee remission, including non-resident tuition (if applicable) and health coverage (GSHIP, Graduate Student Health Insurance Program). In the first year, non-resident tuition is paid by the department. International doctoral students receive the International Doctoral Recruitment Fellowship to pay non-resident tuition in years 2 and 3, and non-resident tuition is waived for international students after advancing to candidacy. Some campus fees are not covered centrally with a TA appointment for pre-candidacy students, but the department pays these fees.

UCSC Fellowships

UCSC Fellowships include the Regent's Fellowship awarded in the fall quarter to all incoming students, Chancellor's and Cota-Robles Fellowships for selected incoming students, and Dissertation Year/Quarter Fellowships awarded to selected students in their final year or quarter.

Fellowships are issued as one-time payments at the beginning of each quarter. Federal and state taxes are not withheld from fellowship payments for domestic students, but are withheld for international students on F-1 or J-1 visas. Fellowships, excluding anything spent on tuition or fees, are taxable income, so you will need to plan for the tax implications when you file your annual return.

External Fellowships

The most common external fellowship is the NSF Graduate Research Fellowship. Students can apply as undergraduates and once during their graduate career, either in the first or second year of the graduate program. Other external fellowships include NASA Fellowships, Ford Foundation Predoctoral Fellowship, and others. These fellowships will typically be disbursed as lump sums and tax will not be withheld, but you should consult with the funding agency for details.

First-Year Summer Funding

Because summer support for first-year students typically comes as a combination of Regents' Fellowship and GSR, the pay schedule can be complicated. You will receive the entire Regents' Fellowship as a one-time payment in mid-June. The July 1 deposit is the final payment for your

spring quarter GSR or TA appointment. Any summer GSR payments, typically at 25% or 50% time as specified in your offer letter, will be issued on August 1, September 1, and October 1. The first fall quarter payment will be issued on November 1.

Establishing California Residency

Students who are US citizens or permanent residents, who meet AB540 requirements, or who hold certain valid nonimmigrant visas should establish California residency at the end of their first year. Information on residency requirements and filing can be found here: <https://registrar.ucsc.edu/fees/residency>. Eligible students who fail to gain California residency may be required to pay non-resident tuition after year 1.

International students studying on an immigrant visa (typically F-1 visas) are not eligible to become California residents. However, non-resident tuition is covered during years 2 and 3 by UCSC's International Doctoral Recruitment Fellowship, and is waived after advancing to candidacy.

Department Awards and Funding Opportunities

The department has several endowed awards to recognize graduate students and to support graduate student research and professional development.

The Aaron and Elizabeth Waters Student Research Fund recognizes outstanding qualifying exam proposals. More information about deadlines, expectations for the proposal, and criteria for assessment are provided in the qualifying exam section of this handbook.

Three awards provide small research grants (typically a few thousand dollars, depending on fund) for graduate students pursuing thesis-related research. The Casey Moore Award supports research on any topic. The Earth's Environment Fund provides support for research on topics such as water resources, climate change, and the evolution of landscapes and aquatic systems. The Zhen and Ren Wu Award provides support for research in geophysics, with an emphasis on students seeking careers in exploration industries. There is a single consolidated application in the spring quarter for all opportunities, requiring a short research proposal that outlines a compelling scientific question and describes the methods to answer that question.

The Eli Silver Earth and Planetary Science Opportunities Fund provides financial support for professional development, education, and living expenses. The deadline for proposals is in the spring quarter.

There is an annual Outstanding Teaching Assistant Award, voted on by our undergraduates. Although this award does not come with financial support, it is recognition of outstanding performance that you can include on your CV.

Every year (spring quarter) we can nominate students for the ARCS Fellowship competition, which provides a \$10,000 stipend to the recipients. This competition is evaluated by a panel of faculty from multiple departments, and selection is based heavily on having a compelling but accessible research statement. The department application includes a brief paragraph stating academic goals/status, achievements, and presentations, and the need for financial support next year; and a short CV or webpage link. Faculty on the department's Graduate Awards Committee will evaluate the applications and select up to two nominees to submit a full application to the ARCS competition.

The campus also offers Dissertation-Year Fellowships for students in the final year of their Ph.D. program (if an awardee does not finish within the year, the department may be ineligible to nominate students for the next year). The applications occur during the spring quarter. The Presidential Dissertation Year Fellowship is based on both academic merit and diversity criteria: the academic achievement of the nominee, the potential for success in academia, and the extent the nominee contributes to the diversity among doctoral degree recipients in the division. The Chancellor's Dissertation Year Fellowship is based on academic merits of the nominee. For both, there is some consideration of prior funding (such as the number of quarters spent as a TA) and applicants should clearly state how the funding will allow them to complete their dissertation. The department can nominate up to two students for each fellowship type, and we have an internal selection process to select our nominees. Students should submit a letter of application with a detailed timetable for completion by the end of the upcoming academic year, letter of support from their Primary Academic Advisor, and a current CV with a list of publications. The Graduate Awards Committee will assess the files and submit our department nominees.

Department Information

Seminars and Department Social Events

Tea Time. Mondays at 3:30 PM in the Dreiss Lobby (A-wing 1st floor knuckle). Tea and snacks are provided and all department members are invited to socialize.

Whole Earth Seminars. Tuesdays at 3:30 PM on Zoom or in Natural Science Annex 101 (room may change in different terms), with tea and snacks starting at 3 PM in the Dreiss Lobby. These seminars are hour-long research talks given by visiting speakers, ideally aimed at a broad audience. Students should commit to attending all of the Whole Earth Seminars regardless of the

topic. Even if the topic is outside of your research area, you may nonetheless learn about relevant ideas or methods, as well as what makes for good slides and an effective presentation.

Geophysics/Planetary (IGPP) Seminars. Fridays at 12:00 on Zoom or in EMS A340. These seminars focus on topics in geophysics and planetary science. All students in those areas should attend these seminars, and all other students should also consider attending.

Chips & Dips. Fridays at 5:00 PM in the Dreiss Lobby. This is a graduate-student run social hour, featuring chips, various dips, and drinks.

Department Leadership Opportunities

Graduate students have several opportunities to take on leadership roles in the department. The main role within the department is as one of the Graduate Student Representatives. There are two Representatives who serve concurrently for terms of around 6 months to one year. The Representatives attend the open portion of faculty meetings (discussions about personnel items are closed to faculty only) to provide graduate student input. The Representatives also act as a conduit to bring concerns and suggestions to the Faculty Graduate Representative and/or Department Chair. Issues can be raised at any time, but Graduate Student Representatives also meet with the Faculty Graduate Representative, Staff Graduate Advisor, and Department Chair on a quarterly basis. The Representatives are also responsible for soliciting student participation on standing and ad hoc department committees. When finishing their term, Representatives should recruit their replacement by asking for interested candidates from all department graduate students.

The department standing Diversity Committee includes graduate student members. There are typically three to four representatives, who serve a one-year term (September-June). The committee meets twice a month and considers issues such as examining department policies to increase equity and developing actions to improve inclusion. The Graduate Student Representatives will solicit self-nominations from all department graduate students and select the members of the committee.

GEODES (Geoscientists for Openness and Diversity in the Earth Sciences) is an EPS student-run organization that hosts community-building and professional development workshops focused on diversity, equity, and inclusion. Participation in GEODES is open to any graduate student who wants to contribute.

Graduate students also organize the speakers for the department Whole Earth Seminar for one quarter (typically Spring quarter). This role is usually done by two graduate students, and

involves soliciting speaker nominations from the department, choosing speakers from the nominees to ensure good diversity among speakers and a breadth of disciplines, and sending invitations to schedule speakers based on their availability.

Additional leadership opportunities are available through the campus Graduate Student Association, as a graduate student representative on Academic Senate committees, and the United Auto Workers union that represents academic student employees (including TAs).

Feedback on Department or Campus Policies

If you have general feedback or suggestions about departmental policies and practices, or campus-wide policies and practices, the department's Graduate Student Representatives act as the liaison between the student body and the department administration (see section on Department Leadership Opportunities). The representatives typically rotate annually and are announced to the graduate email list when new representatives start the role.

Feedback can also be brought directly to the Faculty Graduate Representative and/or Department Chair. In addition, the Graduate Student Association is the official student government body for graduate students, and advocates on campus and systemwide issues.

Computer Support

There are two sets of computer resources available to all students:

Planetary and Marine Computing (PMC) for Department Computers

The contact address for computer support is eshelp@acg.ucsc.edu.

The Planetary and Marine Computing web site at: <https://pmc.ucsc.edu/> has information about the kinds and levels of computing support offered locally for EPS department computer systems.

Department computers (often purchased by faculty and researchers using grants) are supported by the ACG. If you need an account on the department UNIX machines please request an account by emailing eshelp@acg.ucsc.edu. In your request, please include your first name, last name, advisor's name, email address and a phone number where you can be reached (for communicating your account password).

Information Technology Services (ITS) for Central UCSC Computing Resources

The contact address for ITS computer support is help@ucsc.edu. This includes email support for all @ucsc.edu addresses. All graduate students should have a computer account from Information Technology Services (ITS). This can be obtained by visiting the ITS Help Desk (Kerr Hall Rm. 54, M-F 8am to 5pm) or on-line at: http://its.ucsc.edu/support_center/. Please

note that your ITS computer account/access is completely separate from that managed through the department. There are hardware and software resources available across campus through ITS, that you may access only after establishing an ITS account.

University-Provided Software

All graduate students have free access to Microsoft Office 365, Adobe Creative Cloud, and MATLAB through campus site licenses. For more information on how to download this software, see the ITS software website (<https://its.ucsc.edu/software/index.html>).

Administrative Support

The following resources are available in the main EPS Department front office (EMS A232, A234):

Two copiers/scanners are located in A234 for teaching, research, and personal use. For personal copying, machines can be used in many different locations around campus as well and charged to your University accounts. Teaching Assistants use copy cards specific to each course, issued by the department's front office staff. The UCSC Copy Center can be used for color copies (ie maps) and Readers; see the department staff for funding information before emailing an order request to copy@ucsc.edu. Contact your faculty sponsor regarding research-related copying for them to contact ps_copiers@ucsc.edu to add you to their specific account number. Teaching labs in the Earth and Marine Sciences building are each equipped with a data projector. If you need other A/V equipment, you must check it out from the department office. The equipment can be reserved quarterly on an on-going basis or for occasional use on individual days. The sign-out sheet is located in A232. Most instructional rooms are equipped with Wifi, but you should verify that this is the case if it is needed.

Once you and your advisor have identified the keys that you will need one of you will need to fill out the Online Key Request Form at: <https://keys.adc.ucsc.edu>. All key requests must receive authorization from the key holder's supervisor and our department manager. You must respond to the email message link from ADCKey that is directed to the online key agreement. The key request will not move forward until you accept the key agreement. You will then be notified by email once keys are ready to be picked up (usually within two business days).

A mailbox is provided to you in A234. A FAX machine is also available in the department office (A232). Phones are in the front office and some of the graduate student offices. If you need to make long-distance calls, you will need a telephone access code, which you can get from your research advisor. Basic supplies are available in the front office for your use as a Teaching Assistant for classes. In general, office supplies for research purposes should be requested from your Primary Academic Advisor.

Instrument, Instructional and Field Technical Support

The department has three full-time staff who provide broad-based research and instructional support. This team is led by Instrument Engineer Dan Sampson, and includes Specialists Brandon Cheney and Brecky Morris.

Brandon focuses on instructional equipment support, such as stereoscopes, Brunton compasses, microscopes, field instruments, departmental vehicles, etc., and can help arrange camping gear for field trips such as stoves, cookware, lanterns, etc.

Dan provides hardware research and instructional support, including equipment repair, design, and construction, and purchase of new equipment, and is also involved in most infrastructure modifications done in the building. He has experience with many analytical chemical methods (ICPMS, XRD, XRF, Electron Microprobe, etc.) and oversees most of these facilities in the department. He is also the lead for the support team and can help determine the appropriate contact for any particular issue.

Brecky is responsible for software and computer-based instrument control issues, including managing the cluster computing facilities for the Climate Research Group.

If you have an issue that fits into any one of these categories, or if you aren't sure if your issue is covered, email epstech@acg.ucsc.edu. This will generate a ticket that will be promptly addressed.

Department Vehicles

The department fleet includes 12-passenger vans, a cargo van, and 4WD trucks for teaching and research use. Information about vehicle use, the current schedule, and a reservation form are posted at <https://toolkit.science.ucsc.edu/earth-planetary-sciences/vehicles>. Brandon Cheney is in charge of the vehicles and can be contacted at epsfleet@gmail.com regarding complications or maintenance issues or to learn the details of the reservation system.

Department Poster Printer

A poster printer is available in EMS C303, as well as a Mac and a PC that can be used for poster printing or general use. Both a black & white and color printers are also available in that room as well as WiFi. To print a poster, you will need an account from eshelp@acg.ucsc.edu, if your advisor does not already have one for you to use (please ask them first). Printing is \$2 per linear foot and the printer can print up to 42 inches in width. Comprehensive instructions are online at: <https://wikis.pmc.ucsc.edu/pmc/GeneralHelp/PosterPrinting>. For poster printer trouble or questions, please email epstech@acg.ucsc.edu (not eshelp@acg.ucsc.edu).