Welcome. Students pursuing the Ph.D. degree often seek employment in academia, government organizations, or industry, but are also able to establish successful careers in environmental and geotechnical consulting, water and resource management, and energy exploration. Students are prepared for this wide range of careers through a flexible curriculum in which they work closely with their advisor to conduct theoretical, field, and/or laboratory research for a dissertation in their chosen topic.

Admissions

Admission to the graduate program in the Department Geological Sciences (DGS) is highly competitive.

Students should evaluate the research specialties of individual DGS faculty members and contact who they would like to work with prior to submitting an application to the UA Graduate School. They should share the following information with the faculty member of interest and describe what types of research projects (or which particular research project advertised by the faculty) that they would like to pursue as part of their graduate studies. The more detailed they can be, the better.

- Previous research experience: type of experience, relevance to faculty member’s research, depth of expertise
- Professional scientific publications as first author or co-author
- Published conference abstracts and scientific conference presentations
- Awards or other types of recognition

Based on the above, the faculty member will decide whether or not to meet with the student and/or to have a one-on-one conversation via telephone or online. Based on this interaction, as well as any previous information provided by the student, the faculty member then decides if they are interested in advising the student and if they want to advocate for the student to the entire DGS faculty. If they are interested, the faculty member will inform the student that they should submit an application. If the graduate application fee is a financial hardship, the student should share this information with the potential faculty mentor prior to the application deadline. The DGS may be able to cover this fee.

The application process is completed online through the UA Graduate School’s Electronic Application Center.

The Graduate School requires the following materials:

- An online application form
- Application fee payment
- Statement of purpose
- Unofficial transcripts
- Three letters of recommendation
- A Grade Point Average (GPA) greater than 3.0 on a 4.0 scale (international grades are converted by the Graduate School to a 4.0 system)
- If your native language is not English, you will also need to take an English language exam. The minimum TOEFL score for unconditional admission is 79 for the internet-based test. The minimum IELTS score for unconditional admission is 6.5. The minimum PTE score for unconditional admission is 59. The minimum DET score for unconditional admission is 110.

In addition to the minimum Graduate School admission requirements, to be considered for regular admission to the DGS, an application must include:

- CV/Resume
- A bachelor’s degree in Geology or a related discipline (e.g., Chemistry, Mathematics, Physics, or Engineering).
- Transcripts that show the following classes or their equivalents: Physics I, Chemistry I, Calculus I, and at least one of the following: Physics II, Chemistry II, or Calculus II.

The entire DGS faculty will then review the student’s application, carefully examining the following documents:

- Statement of Purpose (SOP). The SOP is meant to inform faculty of your research, teaching, and service plans while a graduate student in the DGS. It is NOT meant to tell us about all aspects of your life but is meant to tell us about the specific qualities you possess that would make you an ideal student, committed scientist, and valuable member of the DGS and UA community. Examples from your recent past that indicate your perseverance, motivation, teamwork, and teaching aptitude would be appropriate to share. As you have previously communicated with a faculty member willing to serve as your Advisor, you should describe the research project or projects you plan to conduct with that individual. You can comment on the broader scientific impact of the project, aspects of the research that you find particularly interesting, previous experiences that make you well-suited for such a project, and how the proposed research will prepare you for a future career in academia, industry, government, or the private sector. You should be able to succinctly state why the DGS at UA is the ideal place for you to pursue your scientific interests. It should be a maximum of two pages in length, single-spaced, with Times New Roman (or similar) 12-point font and 1-inch page margins. Please title the document “Statement of Purpose.”
- Recommendation letters from previous instructors, advisors, or supervisors.
- Transcripts from previous institutions with courses completed and grades (particularly those classes relevant to the proposed research topic).
- CV/Resume, which includes other noteworthy accomplishments such as academic honors, awards, professional and community service.

For fall admission, priority for new graduate students is generally given to applications received by January 15. To have the best chance for acceptance, applications should be submitted by January 15. Applications will be considered after this date but will be given lower priority. Self-funded, scholarship/fellowship, and international applications must be completed by March 15. Applicants will receive notification of their acceptance to the DGS program via email and must acknowledge their acceptance on or before April 15.

For spring admission, priority for new graduate students is generally given to applications received by July 15. Applicants will receive notification of their acceptance to the DGS program via email and must acknowledge their acceptance on or before October 1.

Note that beginning in Fall 2020, the GRE requirement has been permanently removed from our admission requirements.

Ph.D. students are admitted to the DGS with a Dissertation Advisor already established. Ph.D. students may choose to have two faculty
Curricular Requirements

New Ph.D. students may be required by their dissertation advisor to complete one or more of the core courses in Geology (e.g., Mineralogy, Igneous-Metamorphic Petrology, Structural Geology, Stratigraphy and Sedimentology, and/or Field Geology or comparable field experience) if these classes are lacking in their background. These requirements must be taken for a letter grade but can earn the student graduate credit through enrollment in GEO 525 Adv Topics In Geology. DGS Graduate Teaching Assistants (GTAs) should have the relevant background in the course they are teaching, as determined by the Graduate Program Director and course instructor. Additionally, the Graduate Program Committee may recommend classes following the student’s Research Skills Assessment (RSA).

All students must meet with their Faculty Advisor or the Department Chair at least one week prior to registration each semester to discuss current coursework and courses to be taken the following semester. Students must enroll in the courses agreed upon with their Advisor. Most students in their first year register for nine credits per semester.

All incoming Ph.D. students are required to take Communicating Geology (GEO 602) for three credits in the first fall semester (unless it was previously taken as an M.S. student in the DGS). This class must be passed with at least a grade of "C." If the class is not passed, it may be taken again the next fall. Failure to pass this class for the second time will result in dismissal from the Graduate Program. This class will focus on the development of projects for research, proposal writing, and presentation of research results.

In summary, Ph.D. students must enroll in the following credits to earn the minimum of 54 required total hours:

- A minimum of thirty-six hours of 500-600 level courses, including Communicating Geology (GEO 602), two hours of the fall semester Graduate Seminar (GEO 635), and two hours of the spring semester Graduate Seminar (GEO 636). Ph.D. students must take seminar four times during their third and fourth years in the Graduate Program. Ph.D. students may substitute a conference oral presentation made at a national or international meeting for one of the four required seminar credits. If the paper is not accepted for an oral presentation, a poster presentation may be substituted. The faculty member in charge of the seminar and the student’s Advisor will determine if the conference is acceptable and will coordinate the logistics. Students must still enroll in seminar and attend if they are substituting a conference presentation. If an exception is needed, a formal request to take the seminar in a different semester and a plan to fulfill the two years of required seminar credit must be submitted to the Graduate Program Committee. All students should attend seminar, even if not enrolled in the course.

- A minimum of eighteen hours of Dissertation Research (GEO 699), which are graded Pass/Fail by the Dissertation Advisor. Students must present demonstrable evidence that they have performed dissertation research to receive a passing grade.

- No more than nine hours of Non-Dissertation Res (GEO 698).

- No more than eighteen hours from outside the DGS (including transfer credits).

An overall GPA ≥ 3.0 is required for graduate courses. Classes with a grade below a "C" do not count towards the Ph.D. degree. See the UA Graduate School Scholastic Requirements.

20% of the student’s required course credit may be taken on a Pass/Fail basis. 80% must be graded by letter. Taking a class Pass/Fail must be approved by the Dissertation Advisor and the instructor of the course.

Undergraduate courses taken to meet deficiency requirements or as prerequisites for graduate courses do not count toward graduate degree requirements.

See the UA Graduate School Degree Requirements.

Transfer Credit

Ph.D. students may transfer up to eighteen hours of graduate coursework either from previous institutions or credited from a previously earned graduate degree. Students with an M.S. degree can have up to eighteen credits transferred once that degree is verified. Transfer credits will be allowed only on credit that was earned during the six-year period immediately preceding admission to the DGS program. However, if the M.S. degree is older than six years and the student has been working continuously in their major field, then older classes may be eligible.

The student must have earned an overall GPA of 3.0 at the institute where the credit was earned. Only classes with a grade of "B" or higher can be transferred. In order to transfer credit from an M.S. program to the Ph.D. program, the student should indicate this transfer on the Plan of Study form and submit this to the Graduate School.

See the UA Graduate School Degree Requirements.

Doctoral Plan of Study Requirement

The doctoral Plan of Study must be completed in consultation with the student’s Dissertation Advisor.

See the UA Graduate School Degree Requirements.

Dissertation Advisory Committee

Ph.D. students are accepted with an Advisor already assigned. If the faculty member leaves UA after the student is accepted, the Ph.D. student will initially be advised by the Department Chair. The student will identify an area of specialization and an Advisor in the first semester of residence.

The Dissertation Advisory Committee consists of five members: the Dissertation Advisor within the DGS, at least two additional full-time or adjunct faculty members of the DGS, and no more than two external members, who must be approved by the Dissertation Advisor, and who will provide additional supervisory expertise. A dissertation committee can have more than the required five members, but a majority...
 (>50%) must be DGS faculty. All members of the Dissertation Advisory Committee must be Graduate Faculty members.

If the external member does not have a Ph.D., evidence must be provided of their qualifications to serve on the Committee. If an individual is not a member of the DGS Graduate Faculty, they must submit their CV to the DGS Administrative Assistant responsible for the Graduate Program to begin the approval process, which typically takes two or more weeks to complete.

Students are required to meet each semester with their Dissertation Advisory Committee, at which time progress toward degree requirements will be evaluated. A student who is not making satisfactory progress will receive a letter from the Dissertation Advisory Committee advising the student how to remedy the matter.

See the UA Graduate School Degree Requirements.

**Dissertation Proposal and Proposal Defense**

When three independent but associated projects are defined, the student prepares a Dissertation Proposal. The Dissertation Proposal includes a title page followed by no more than 15 double-spaced pages with 12-point font containing an abstract, introduction, associated objectives, methods, significance of research, and an estimated timeline for work completion. The title page should identify the student, the major field of specialization, the proposed title of the dissertation, all members of the Dissertation Advisory Committee, and ultimately, the date of document approval by the Dissertation Advisory Committee. The body of the proposal should state the research problem and its significance, provide a concise summary of related previous work, define the objectives of the research, outline the proposed research methods, and discuss the significance of the anticipated results, followed by an estimated timeline. The proposed research should result in at least three publishable manuscripts. The 15-page limit for the Ph.D. Dissertation Proposal includes figures and tables but does not include references.

The Dissertation Proposal Defense must occur in the third semester of the student's graduate program.

The student must distribute the Dissertation Proposal to the Dissertation Advisory Committee at least three weeks before the planned date of the Dissertation Proposal Defense. All members of the Dissertation Advisory Committee must certify that the proposal is ready for defense two weeks before the defense can take place either by signature on the appropriate form or by an email directly to the DGS Administrative Assistant responsible for the Graduate Program. The email from the Committee member must state that the member has read the proposal and approves it for defense.

The Dissertation Proposal Defense is scheduled by the student, in consultation with the Dissertation Advisor, on a weekday that accommodates the schedules of all five Committee members. One member can be present via teleconferencing. If two or more members need to participate via teleconference, permission must be obtained by the Advisor from the Graduate Program Director by completing the associated form. The student must schedule a three-hour block of time. The purpose of the Dissertation Proposal Defense is to describe plans for the dissertation research and to provide a means to evaluate the potential of the student to plan and carry out the research project. The defense includes an oral presentation of the Dissertation Proposal, focusing on the three projects for the dissertation research. The defense is administered by the Dissertation Advisory Committee, chaired by the Dissertation Advisor, is open to the public, and is thirty minutes long.

The open session is followed by a closed session of questioning by the Dissertation Advisory Committee, DGS faculty, and Ph.D.-level Research Staff.

The outcome of the Dissertation Proposal Defense is decided by majority vote of the Dissertation Advisory Committee and attending DGS faculty. Several outcomes are possible. (a) A Full Pass entitles the student to proceed with the proposed research with no substantial modification of the research goals, objectives, or planned coursework. However, the Committee may request edits to the proposal. (b) A Conditional Pass entitles the student to proceed with the proposed research under conditions stipulated by the Committee. These may include, but are not limited to, specification of coursework, modification of the research plan, or modification of the research objectives. All changes to the research plan and objectives must be included in a revised Dissertation Proposal. (c) A Fail requires the student to repeat the Proposal Defense after substantial modifications to the research plan and/or objectives. The defense can only be repeated once. If failed again, the student is dismissed from the DGS Graduate Program. Each of the three outcomes requires an Action Plan agreed upon by the Committee and implemented by the Advisor that details a path forward for the student. This Action Plan lays out strengths, solutions for weaknesses, and expectations from the Committee in the coming years. A timeline will be included for addressing identified weaknesses.

After approval, copies of the Dissertation Proposal must be distributed to the Dissertation Advisory Committee. In addition, a PDF-formatted electronic copy must be provided to the DGS Administrative Assistant responsible for the Graduate Program.

See the UA Graduate School Degree Requirements.

**Comprehensive Exams**

**Research Skills Assessment**

The Research Skills Assessment (RSA) takes place within the student's second semester in residence. Two hours are set aside to determine how the student approaches solving problems and to identify knowledge deficiencies. The meeting will be attended by the Graduate Program Committee plus the Advisor. This assessment should not be viewed as an exam but more an evaluation of where a student stands in their scientific development. The Committee will approach this assessment with the main question “How do we help this student succeed?” Possible outcomes include: Pass; Identify deficiencies; Reduce to an M.S. degree; Fail. The results of the assessment will be provided by the Committee in a memo to the student signed by the Graduate Program Director and Department Chair. The results of this assessment includes requirements that must be met before the preliminary exam in the fifth semester, except in extenuating circumstances where a recommended or required class is not offered. This assessment will not be re-administered.

**Preliminary Examination**

Ph.D. students will submit a draft of their first paper, approved by their Advisor, to their Dissertation Committee by the third month of the 5th semester in residence. For this to happen, the research must occur in the 3rd and 4th semesters, with writing of the manuscript prior to and during the 5th semester. The review criteria of the paper will be provided to the student, prior to the examination, by their Advisor. The manuscript must be submitted to the Dissertation Committee three weeks before the proposed Preliminary Examination date. All five Committee members must attend. The date will be advertised to the DGS faculty and any faculty that attends must have read the manuscript to be a voting member. In the Preliminary Examination, a conversation will develop about the manuscript and questions may arise to make sure the
Dissertation Preparation and Review

The DGS requires the dissertation be at least three separate, first-authored manuscripts in addition to an introductory chapter and concluding chapter that ties the three papers together. At least two of these manuscripts need to be submitted to a journal by the time of the defense. The Committee realizes that in rare situations (for example, on research cruises) the chief scientist is granted first authorship no matter who writes the paper. The Graduate Program Committee will take this into account on an individual basis. The student must prepare the dissertation using two sets of guidelines: 1) Graduate School guidelines; 2) format of a scientific journal to which one of the papers was submitted.

Preferred format for the dissertation:

- Title page and abstract with preliminary pages.
- Chapter 1: Introduction for the dissertation describing the overall theme and scientific problem(s) that ties all three manuscripts together, with reference list.
- Chapter 2: Paper 1, including all components (abstract, intro, methods, data, results, interpretations, conclusions, references).
- Chapter 3: Paper 2, including all components (abstract, intro, methods, data, results, interpretations, conclusions, references).
- Chapter 4: Paper 3, including all components (abstract, intro, methods, data, results, interpretations, conclusions, references).
- Chapter 5: Conclusions for the entire dissertation (addressing the questions set forth in Chapter 1).

Appendices

The student submits drafts of the dissertation to their Advisor. The student and the Advisor will work together and go through several revisions. When it is approved by the Advisor, the dissertation is submitted to the other members of the Dissertation Advisory Committee. Review by the Dissertation Advisory Committee and revisions by the student based on their suggestions may take many weeks. The student must account for this revision time when planning a graduation date. The Committee may also require several revisions before a Dissertation Defense can be scheduled. If a Committee member takes longer than three weeks for a review, a formal complaint should be sent to the Department Chair or the Graduate Program Director.

Dissertation Defense (Final Oral Examination)

When the Dissertation Advisory Committee is satisfied with the dissertation, a Dissertation Defense is scheduled. All five members of the Advisory Committee must sign the relevant digital form or email their consent directly to the DGS Administrative Assistant responsible for the Graduate Program. The email from the Committee member must state that the member has read the dissertation and approves of the defense. The dissertation must be formatted in the Graduate School dissertation format and displayed in the DGS front office two weeks prior to the Defense to allow reading and revision by the remainder of the DGS faculty. Faculty members have the right and responsibility to comment and provide feedback if the dissertation is deficient. It is the responsibility of the Advisor and the student to schedule the Defense so all five members of the Dissertation Advisory Committee can attend. If a member cannot be present or the external member cannot attend via teleconference, the student must replace that member, and the appropriate paperwork must be filed.

Questions may cover a wider area of Earth Science topics than the dissertation but are generally relevant to the dissertation subject. The exam will be administered by the student’s Advisory Committee, and the exam is open to the public. The student will give a presentation (no longer than 45 minutes), emphasizing their results and conclusions.
The exam is then opened for questions from the audience, after which additional questions from the Dissertation Committee, DGS Faculty, and Ph.D.-level Research Staff are given in a closed session. All DGS faculty members who attend the exam and subsequent questioning session have the right to vote whether the student passes or fails. This vote is decided by majority and recorded in an electronic form initiated by the Advisor that states the student has Passed/Failed the Dissertation Defense. The Dissertation Defense can only occur once and cannot be repeated if failed.

**Final Disposition of Dissertation and Dissertation Collections**

The Dissertation Advisory Committee and the student must complete the Committee Acceptance Form. By signing this form, the Committee confirms that they have read the final PDF-formatted document and have approved all changes to the manuscript, ensuring the standards of the DGS are upheld.

The final PDF of the dissertation, formatted following Graduate School specifications, must be submitted online to ProQuest, the Graduate School Deadline Information. In addition, students are required to provide a PDF dissertation file to the DGS Administrative Assistant responsible for the Graduate Program and the Advisory Committee.

Samples, data, computer programs, etc. used in dissertation research are the property of the UA unless other arrangements are approved by the Dissertation Advisor. As such, all of these materials must be left with the DGS, and students should check with their Dissertation Advisor before taking proprietary data out of the DGS upon graduation. It is the responsibility of the student to determine whether the Museum of Natural History wants a collection of dissertation samples. The Museum of Natural History wants a collection of dissertation samples.

**Timeline for Degree Completion**

A suggested timeline for degree completion is provided on the DGS Graduate Program Website.

After not enrolling in classes for three years, a student must complete their degree, they must reapply to the Ph.D. DGS Graduate Program.

All requirements for the Ph.D. degree must be completed within nine years (twenty-seven fall, spring, and summer semesters).

**Academic Progress Policies**

Upon appointment, students must have a meeting each semester with their Dissertation Advisory Committee. Students not in residence must submit a written progress report each semester. Current and future research efforts will be reviewed to determine if satisfactory progress has been made toward completion of degree requirements. If the student has not followed the required timeline, the student’s research project will be terminated and the Advisory Committee will be disbanded. In the event of project termination, the student must propose an acceptable new research project and complete a dissertation prior to the end of the seven-year Ph.D. candidacy period.

It is not the responsibility of the Advisor, the Graduate Program Director, the Graduate Program Committee, or the Department Chair to ensure that the student has filled out the proper paperwork and submitted the paperwork to meet their deadlines. If the paperwork is filled out incorrectly or a deadline/milestone is missed, the result is a delay in the graduation of the student. To request an extension on any milestone, a memo must be submitted to the Graduate Program Committee. Format for the extension request memo is available from the Graduate Program Director. The memo must contain a proposed timeline acceptable to all parties.

**Student Activity Report**

On April 30, all graduate students are required to submit a report to the DGS detailing their activities throughout the year. Activities include abstracts submitted, internships, papers published, conferences/workshops attended, field work, volunteer activities, etc. A form is provided each year for this report. If not completed, the student will be unable to schedule graduate milestones (e.g., dissertation defense).

**Academic Misconduct Information**

The Graduate Program Committee will address any problems or improper conduct with graduate students brought up by the Department Chair, GTA Supervisor, Faculty Advisor, or other graduate students. Faculty members are mandated reporters if there is a Title IX violation, the report will be passed to the Title IX Administrator. Otherwise, a meeting with the Advisor, Department Chair, Graduate Program Committee, and the student will be called to determine if the solution to the problem can be found.

See the UA Graduate School Academic Misconduct Information.

**Withdrawals and Leave of Absence Information**

**Leave of Absence**

The DGS has no formal policy for a medical leave of absence. We try to accommodate a semester leave of absence if there is need documented by a medical professional. The Graduate Program Director will require that the student inform the DGS by a certain date in the semester to determine if the student will return to the department in the next semester. If a leave of absence is needed for professional development, the matter needs to be brought to the Graduate Program Committee for a vote.

See the UA Graduate School Withdrawals and Leave of Absence Information.

**Academic Grievances Information**

**Procedure for Changing Advisors**

Graduate students must schedule a meeting with the Graduate Program Director or the Department Chair if they want to change Advisors. A new Advisor must be identified. The Graduate Program Director/Department Chair will discuss procedures and inform the old Advisor. If the switch happens after the proposal is successfully defended, a new proposal defense with a new Committee must occur. The timeline will be determined by the Advisor and the Graduate Program Director.

If the Advisor wants to end an Advisor/Advisee relationship with a graduate student, a Committee consisting of the Graduate Program Committee and the student’s Committee will be formed to evaluate the situation.

See the UA Graduate School Degree Requirements.

**Grades and Academic Standing**

See the UA Graduate School Grades and Academic Standing.

**Graduate School Deadline Information**

See the UA Graduate School Deadlines.
Application for Graduation Information

See the UA Graduate School Degree Requirements.

Funding

The DGS faculty will vote to admit a limited number of students suitable to the availability of positions within the department. Faculty members with awarded, external research funding may be able to support a graduate research assistant (GRA) for one or more semesters. Alternatively, the DGS has a limited number of graduate teaching assistantships (GTA) available each semester that may be used to financially support incoming students. We note, however, that current students are given priority for these positions. Accepted Ph.D. students are guaranteed ten semesters of funding if requirements are met. The source of financial support may vary from semester to semester.

All students receiving an assistantship or fellowship must be registered as full-time students. For students on a 0.25 or 0.5 FTE assistantship this equates to at least six hours of coursework during each of the fall and spring semesters. Students on a fellowship must be enrolled in at least nine hours of coursework during each of the fall and spring semesters. Reasons for revocation of funding include, but are not limited to:

- Failure to pass the required course, Communicating Geology (GEO 602), for a second time with a grade of "C" (see Curricular Requirements (p. )).
- Failure of the Research Skills Assessment (RSA) Examination.
- The student displays poor academic performance.
- The student does not adhere to the UA academic honor code.
- The student does not fulfill job duties as a GTA/GRA as specified in the Memorandum of Appointment (MoA).
- The student makes inappropriate remarks or actions toward staff, faculty, other graduate students, or undergraduates.
- The student becomes a danger to others.
- If graduate deadlines/milestones are not met, and the student has not formally requested an extension from the Graduate Program Committee.
- Failure to defend the dissertation proposal by the third semester in residence. Students not receiving financial support in the first three semesters, but seeking aid for subsequent semesters, will not be considered for support until a dissertation proposal is successfully defended.
- Failure to pass the second attempt of the Preliminary Examination (1st manuscript defense).
- If the student is funded as a GRA, changing Advisors will result in the loss of funding. If the student is funded through a GTA and decides to switch Advisors, the GTA position will continue provided that a new research project has been chosen.