

Department of Geology & Environmental Science

University of Pittsburgh

**Graduate Student Handbook
2026**

Welcome to the Department of Geology & Environmental Science!

Information in this handbook applies to all students admitted for study in all Graduate Programs of the Department of Geology & Environmental Science at the University of Pittsburgh. This manual supplement information provided online. Additional useful information can be found online at the Kenneth P. Dietrich School of Arts and Sciences web site (<http://www.as.pitt.edu>) and the Dietrich School Graduate Studies web site (<http://www.asgraduate.pitt.edu>). The Graduate Studies Office offers information, help, and troubleshooting for many areas pertaining to graduate student life, including many important forms and policies you will require during your time here (<https://www.asgraduate.pitt.edu/academics/academic-resources>). You should be familiar with these sources of information and use this manual for subjects specific to Geology & Environmental Science.

During your residence in our program, you should remain in contact with the Department Office about all deadlines and milestones. In addition, the Department Graduate Administrator, and/or Director of Graduate Studies should be consulted regarding such matters as transfer of credits, tuition, fees, residency requirements, thesis credit requirements, and taxes on assistantships.

More information is available in the Dietrich School of Arts and Sciences Graduate and Professional Bulletin (<https://catalog.upp.pitt.edu/index.php>)

This handbook was updated September 2026

The information in this handbook and other University catalogs, publications, or announcements is subject to change without notice. University offices can provide current information about possible changes.

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Geology & Environmental Science Administration

GES Department Office

The Geology & Environmental Science Department office is located in room 200 of the Space Research Coordination Center (SRCC) Building, 4107 O'Hara St., Pittsburgh, PA 15260. The office is open from 8:00 – 4:00 daily.

The ***Graduate Administrator*** facilitates all aspects of graduate study. She is here to help you with your academic career from admission to graduation. Be sure to keep her up to date with your progress or any changes in your program, either in person or via e-mail.

Francesca Sirianni

Graduate Administrator (GA)

Email: FRS38@pitt.edu

The ***Director of Graduate Studies*** oversees academic aspects of graduate study and is available to all graduate students in the G&ES Department for advice related to study. The DGS, in consultation with the Graduate Committee and Department Chair, also approves graduate student program plans and committees, and oversees annual reviews of all graduate students.

Daniel Bain

Director of Graduate Studies (DGS)

Email: dbain@pitt.edu

414 SRCC

The ***Department Chair*** oversees all aspect of departmental operations and is available to all graduate students who have questions or concerns.

Nadine McQuarrie

Department Chair

Phone: 412-624-8870

Email: nmcq@pitt.edu

The ***Department Chemical Hygiene Officer*** oversees all aspect of laboratory and chemical safety.

Molly O'Beirne

Chemical Hygiene Officer: [Email:mdo25@pitt.edu](mailto:mdo25@pitt.edu)

Graduate student records are maintained by the Graduate Administrator in the Department office. Please contact the graduate administrator for a particular form (milestone cards, committee forms and others as forms must now be distributed and signed via DocuSign).

The **G&ES Graduate Work Committee**, in consultation with the Department Graduate Faculty, establishes and enforces requirements within the graduate programs of the Department. These include setting policy, determining the direction of the programs, approving courses within the programs, and monitoring graduate student progress in fulfilling required milestones for their degree. The Committee conducts annual reviews of all Department graduate students.

There is a **Graduate Student Representative** who attends all Faculty meetings of the Department. Any issues affecting graduate students can be brought to the attention of the faculty through this venue.

The **Graduate Student Committee** is an informal group that works to improve academic and social life for G&ES graduate students and fosters a sense of community. Activities they support include a post-Colloquium reception, an annual department research fair, and other gatherings.

The **Graduate Student Organization (GSO)** of the University of Pittsburgh Dietrich School of Arts & Sciences is an official university student organization that advocates the interests and concerns of the graduate students of the Arts & Sciences. The GSO provides the primary avenue of communications between graduate students and the administration as well as other university entities. The A&S GSO is also responsible for dispersing 50% of the student activity fees that A&S graduate students pay each semester.

Grievance Reporting

Part of a graduate education is learning how to work as a member of a collaborative team and overcome challenges in communication that may stem from differences in world view, background, ethics, and priorities. However, there are instances where power hierarchies or group dynamics create unjust or unlawful situations that need to be addressed and/or reported to authority at the department level or higher. Do not hesitate to report seemingly minor issues, because the cumulative effect of many small incidents can become a systemic issue. More importantly, consistent documentation of patterns of behavior are the cornerstone of cases underlying grievances. Document issues from the first occurrence and record everything you can remember every time: what happened, when, and with whom, as well as if you shared the information with anyone else. This information will be important through the grievance reporting and resolution process no matter which avenue you choose to take.

Here we outline the most common courses of reporting at the department level and separately describe options and requirements for reporting at the Dietrich School level and University level if grievances are not resolved at the department level. If you have any concerns or confusion about the grievance reporting process, contact the Graduate Administrator or any member of the GES Department Diversity Committee (<https://www.geology.pitt.edu/diversity-and-inclusion-committee-members>).

Department Grievance Reporting

In general, most reporting begins with your graduate advisor. Bring issues up with your advisor at the first onset of a problem. Part of your advisor's job is helping you develop skills and strategies to solve these problems. Further, if you would like multiple perspectives, you are encouraged to discuss issues with other faculty or staff as you see fit.

If the issue persists after working with your advisor to address it, your advisor does not have the authority to address your issue, or you wish to bypass your advisor due to a conflict of interest, you should contact the Director of Graduate Studies (DGS). If they are unable to resolve the issue, the next step is to contact the Department Chair (contact info for both are provided at the beginning of this handbook). In addition, you can talk to other potentially allied faculty members outside the normal chain of command.

For special cases that require stepping outside this established hierarchy to ensure that you have someone uninvolved with the issue to reach out to, contact the Graduate Administrator. To meet with the Graduate Administrator privately, email or call them and they will set up a private meeting. Dietrich School Grievance Reporting

If you are not satisfied with the way in which the department has attempted to resolve your complaint, or you choose to bypass departmental reporting, you can contact the Ombuds Office.

The Ombuds Office provides a safe, welcoming, confidential and unbiased setting for graduate students within the Dietrich School of Arts and Sciences and College of General Studies to discuss concerns, connect with resources and explore options for informal resolution. Students may contact the Ombuds Office to discuss difficulties that have been unresolved elsewhere or to discuss new issues. Students are encouraged to contact the office at the earliest stages of an issue or grievance so that they can assist before escalation occurs. Ombudspersons can listen to concerns, provide information on both internal and external policies and procedures, connect individuals with appropriate resources, and explore options for resolving conflict or surfacing issues of concern.

For more information, or to schedule an appointment, contact:

Lisa Lang, Director of Ombuds Services

Email: lisalang@asombuds.pitt.edu

Phone: 412-624-1164

Request a confidential consultation: <https://aspittombuds.caseiq.app/portal>

University Grievance Reporting

Issues regarding bias, discrimination, harassment, retaliation, or barriers to accessibility at the University of Pittsburgh can be reported directly to the Office of Institutional Engagement and Wellbeing. Reporting to the Office of Institutional Engagement and Wellbeing can be done in addition to the other methods mentioned above or independently. This office has a defined set of options for reporting. For example, you may submit a report either with your name or anonymously. Further, you may report regardless of whether you were the target of the incident, a witness to the incident, or another party. To report an incident to the Office of Institutional

Engagement and Wellbeing, please visit

<https://app.convercent.com/en-us/Anonymous/IssueIntake/IdentifyOrganization>

Safety and Training Requirements

Safety requirements, training, and rights and responsibilities for a safe workplace should be covered by your advisor. Be advised that the University requires training for laboratory safety and hazardous waste, research involving human and animal subjects, and other topics. Check with your advisor for further details. If you observe safety risks in your laboratory and your supervisors are not responsive, you can contact the department's chemical hygiene officer.

Facilities

University ID Card

Your University ID card is important for many aspects of life on campus, and also gets you free use of public transportation in the area. You can obtain your ID online: <https://www.pc.pitt.edu/pitt-id>. Once you upload your photo you can either obtain a mobile ID or you can pick up your ID card at Panther Central, located in the lobby of the Litchfield Towers. Your ID card is your access to the building between 10pm and 6am. You should formally request access for your card via Lou Lane (facilities coordinator, 100 Allen Hall, LOL17@pitt.edu).

Research Facilities

Numerous research laboratories and support facilities exist in the Department and elsewhere at Pitt and the surrounding region that are potentially available to you as a Graduate Student. Arrangements to use these facilities may be facilitated by your advisor, or by approaching faculty/staff directly.

Office & Desk Space

Full-time graduate students typically are assigned a desk in shared office space. They also typically have research space in the lab(s) of their advisors. Please contact the Graduate Administrator with any questions.

Keys

As a full-time graduate student, you may be assigned keys or key codes to various rooms in the building(s) in which your office, lab, or teaching classroom(s) are located. The department office will issue the keys and codes to you directly.

Computer Facilities

Computer facilities vary according to departments. The G&ES Department maintains some student computer facilities, primarily SRCC 210. Computers and programs for general graduate student research are considered the responsibility of the students and their faculty advisors. The department has a limited number of laptop computers that can be temporarily checked out for instructional use in a class or lab. For computer-related technical support submit a help ticket through <https://services.pitt.edu/TDClient/33/Portal/Requests/Service/96/Technology-Help-Desk>

Electronic Mail

All University students receive an e-mail account, internet access and 50 Gb of cloud storage space. You may access your account from a networked machine on campus, through a wireless connection, or through the University's web site from anywhere in the world with a web browser. More information on University of Pittsburgh computing and technology facilities available can be found at <http://www.technology.pitt.edu>.

Email is widely used for individual, department, university, and professional communications. For this reason, you must access your university account regularly. All class-related e-mails and

many general distribution G&ES memos are sent via your university e-mail. The G&ES department uses a listserv to notify students of seminars, job opportunities, student group meetings, and other items of interest. Additionally, many job postings, calls for papers for conferences around the country, and other nationwide professional messages are distributed via e-mail. You are responsible for regularly checking your university e-mail messages.

If you decide to forward your university mail to another provider such as gmail, be aware that other providers may not allow large attachments. Remember, your university email is your official address for University correspondence.

All University student and staff email addresses are available online by searching at <http://find.pitt.edu>.

G&ES Web Site

The Department web site at <http://www.geology.pitt.edu> has information about the program, including web pages for current faculty and students, degrees and course descriptions, and information about graduates (alumni) of the program.

Mail

Campus mail is another method of communication with students. Graduate students receive both campus and U.S. mail in SRCC 200A. Check with the Academic Coordinator about your mailbox arrangements. Boxes for outgoing campus mail and U.S. mail are also located in the Department office, but outgoing U.S. mail is faster if you take it to the U.S. Postal Service blue mailbox on the corner of Parkman Ave. and Bigelow Blvd. Be sure to regularly check your campus mail.

Copy/Fax Machine

A photocopier, scanner, and fax machine is available in SRCC 200A. You will need to set up “uniflow” on your computer to print (<https://services.pitt.edu/TDCClient/33/Portal/KB/Article/1131/uniFLOW-for-Printing-and-Scanning>). See the Academic Coordinator for assistance.

Conference Room

The Department conference rooms (SRCC 214 and 306) and other rooms are available for Graduate student activities. It can be reserved for meetings, exams, and other appropriate gatherings. Reservations must be made through the Department office.

Facility Repairs and Emergencies

In case of emergency, notify Lou Lane (412-624-0360; lol17@pitt.edu) or Cindy Niznik (412-624-9070; niznik@pitt.edu). To report problems with facilities, contact Lou Lane (412-624-0360; lol17@pitt.edu). In case of laboratory accidents, please contact the person in charge of that particular lab and the Department chemical hygiene officer.

Graduate Advising

Advising Code of Conduct

Advising and mentoring relationships are most successful when expectations are clear and openly communicated between those involved, and when both parties are willing to resolve issues as they arise. Faculty advisors cannot fill every mentoring role that the student needs. Students are encouraged to actively seek additional mentoring relationships through other faculty, staff, students, and others outside academia. A faculty advisor and student should maintain open communication and regularly review expectations and limitations of their respective positions in the relationship. As a student progresses through the program and their skills develop, this relationship will evolve, and it is important to remain cognizant of expectations and limitations of this relationship. The faculty advisor and student guidelines listed below can be used to facilitate productive and mutually beneficial relationships, outline best practices for both parties at any point or level in the graduate program, and inform the Annual Graduate Mentorship Plan. While these guidelines are likely universal across all faculty advisor-student relationships, additional individualized expectations can be discussed and added to the Annual Graduate Mentorship Plan.

ROLE OF FACULTY ADVISORS

- Serve as a role model and professional mentor to graduate and undergraduate students, staff, and junior faculty.
- Help students develop academic, research, writing, oral, quantitative, or other relevant professional skills required in geosciences.
- Be mindful of time constraints (work hours/holidays/vacation time) and other family and work responsibilities of students.
- Assist students in creating a personalized plan of courses to provide the skills needed to complete their degree program (degree requirements and full course list are in the Graduate and Professional Studies Catalog).
- Help students understand the requirements of the degree program at university and department levels (Ph.D., M.S., or Professional M.S.) to ensure timelines and milestones are met and students are meeting their research responsibilities.
- Define research goals verbally and in writing, including relevant research tools, procedures, facility access etc. to ensure understanding across cultures and experience levels.
- Encourage faculty-graduate student collaborations which entail the sharing of authorship or rights to intellectual property developed in research or other creative activity. Discuss laboratory or research authorship policies with students in advance of entering into these faculty-graduate student collaborative projects.
- Encourage students to be open about problems in their working relationships (including the relationship with an advisor, committee member, student or staff), and being open to addressing such problems.

- Provide students with an evaluation of their progress and performance in regular and informative ways.
- Help students understand the rules of the institution, including regulations governing graduate study, or direct them to appropriate resources.
- Prepare students to be competitive for employment or future graduate programs by acknowledging student contributions, encouraging participation in academic and research-related conferences, professional publications, and/or industry internships if applicable to the student's career goals.
- Encourage students to participate in professional organizations and build on their personal skills and interests in ways that might benefit the student, university, or society.
- Maintain professionalism in all interactions, be respectful and honest in your communication, try to avoid conflicts of interest, interact with students, staff, and faculty colleagues in a professional and civil manner.
- Be attentive to student difficulties and stressors, and refer them to outside resources as needed.

ROLE OF GRADUATE STUDENTS

- Be aware of the advising limitations due to the advisor's larger role at the university and other obligations (teaching, service, etc.), including time constraints (work hours/holidays/vacation time).
- Maintain professionalism in all interactions, be respectful and honest in your communication, avoid conflicts of interest, and interact with other students, staff, and faculty in a professional and civil manner.
- Recognize that the faculty advisor is responsible for monitoring the accuracy, validity, and integrity of a student's research.
- Address problems as early as possible following the grievance process laid out in the Department Graduate Student Handbook (this document).
- Be aware of the regulations, policies, and practices governing financial aid, degree and course requirements, research activities, and conflict resolution (outlined in this Graduate Student Handbook) and seek clarification from appropriate resources.
- Exercise high professional standards in all aspects of your research and studies (observe the University's Academic Integrity Code). Maintain integrity in taking examinations and in collecting, analyzing, and presenting research data. This includes acknowledging contributions of the faculty advisor and other members of the research team to your work, as well as sources of financial support.
- Understand the requirements of your degree program (Ph.D., M.S., or Professional M.S.), discuss a reasonable timetable with your advisor/committee to meet milestones. Progress towards these milestones will be assessed annually, following the annual review procedures in this Graduate Student Handbook.

Graduate Program Information

Degree Options

Both M.S. and Ph.D. degrees are available through the Geology & Environmental Science Department, as well as a professional M.S. degree in Geographical Information Systems (GIS) & Remote Sensing (RS). Details of individual graduate programs are included below; here you can find information that is common to all degree programs.

Admission

Prospective graduate students must fulfill the requirements for admission to graduate study in the Graduate Programs of the Faculty of Arts and Sciences, described in the sections on Admission and Registration regulations in the Faculty of Arts and Sciences Bulletin.

- A cumulative grade point average of at least 3.0 on a 4.0 scale
- TOEFL: Effective January 21, 2026, the TOEFL score scale will change from 0-120 to **a new scale ranging from 1 to 6 in increments of 0.5**. This shift is intended to better align TOEFL scores with the Common European Framework of Reference for Languages (CEFR), a globally-recognized scale for assessing language proficiency.
 - The DSAS current TOEFL score 90 will shift to **a minimum overall score of 4.5 with 4.5 in the speaking, reading, writing sub-section and a 5.0 in the listening sub-section**. TOEFL provides a comparison between the new and old scoring systems, including recommendations for common score requirements.
 - TOEFL scores submitted must not be more than two years old.
- IELTS: score of 7.0, with at least 6.5 in each of its four sections. IELTS scores submitted must not be more than two years old.
- Duolingo English Test: Minimum score: 120. Duolingo scores submitted must not be more than two years old. The Duolingo English Test is an online English proficiency test that can be taken online, on-demand, in under an hour. Effective April 2, 2023, the cost of a single test will be \$59 . The test is taken via a computer with a camera and includes a proficiency score, video interview, and writing sample which are shared with the University of Pittsburgh when you send your results. Certified results are available within 48 hours of the test session.

Successful applicants to the Department of Geology and Environmental Science may be admitted with full graduate status or with provisional status, depending on the undergraduate major area of study and grade point average (GPA). Full graduate status may be offered to students who have completed an appropriate undergraduate program in one of the natural or physical sciences related to Geology and Environmental Science and who have received satisfactory grades (generally B or higher) in science and mathematics courses. Students who have received a

Master of Science degree from the Department of Geology and Environmental Science at the University of Pittsburgh and who wish to enter the Ph.D. program are encouraged to discuss this with the DGS, Chair, and Graduate Administrator. Typically, they should submit a standard application to the Department.

An applicant with a GPA below 3.0 may be admitted with provisional status. Transfer from provisional to full status may occur upon formal recommendation of the Department following satisfactory completion of four courses (twelve credits) for which graduate credit is earned with at least a 3.0 (B) average. To initiate change of status, the student's Initial or Major Advisor must complete a formal request to the Associate Dean of Graduate Studies that the student be transferred to full graduate status.

Readmission

A student who has not registered for at least one credit during a twelve (12) month period, (without obtaining a formal leave of absence) will be transferred automatically to inactive status and must file an application for readmission to graduate study (and pay the application fee) before being permitted to register again. While on inactive status, a student is not eligible to use University facilities and should not expect to receive counseling by the faculty or active supervision by her/his advisor.

Registration

Registration is completed online through the Student Center Web Portal at <http://my.pitt.edu>. Students are encouraged to register as early in the process as possible, as space is limited, and some courses fill up quickly. You should meet with your faculty advisor to discuss your schedule. Please email the Graduate Administrator and your faculty advisor with your course selection. The Graduate Administrator will release your advisement hold and release any permission numbers required to register. If you do not have a permanent advisor, the DGS will serve that role until one is assigned. If difficulties arise during the registration process, consult the Graduate Administrator or your advisor.

To be considered a full-time student, you must register for 9-15 credits. PhD students who have completed all 72 credits, all course requirements, and Comprehensive/Overview Exams should register for Full-Time Dissertation Study (FTDB 3999) in addition to GEOL 2015 Colloquium.

Some classes require a permission number. This can occur when

- a class is closed
- a prerequisite has not been satisfied
- a class is set with department/instructor consent
- a class is in a department other than the student's

To acquire a permission number for a G&ES course, you will need to contact the faculty member by email requesting permission. The faculty member will forward your request to the Graduate Administrator granting or denying the request. It is helpful to include your PeopleSoft number in this request. Permission numbers from other departments must be obtained by following that department's procedure.

Student Advisement

Graduate students have a much closer working relationship with their advisors than they may have had as undergraduate students. Regularly scheduled meetings (weekly or biweekly) to discuss your program and progress are recommended, and all students must complete an annual review with their adviser during spring semester. Further, beginning in the second year, students should meet with their committee on an annual basis.

Situations occasionally arise in which a change of advisor is appropriate and desirable. You may find that your research interests match more closely with another faculty member. Occasionally, personality conflicts can also arise. You should not feel locked into your initial choice. At the same time, you should recognize that changing advisors is a major decision that should not be taken lightly, especially if you have been in the program for several semesters. In some cases, your advisor may have invested substantial time and research support into your development. Before requesting a change, you must consider whether another faculty member is available and willing to supervise your research, and whether assistantship funds will be available. Except in rare circumstances, you should discuss the proposed change with your current advisor. If that is not possible, you should meet with the DGS for advice and approval. When a change has been approved, you should notify your former advisor, your new advisor, and the DGS in writing.

Major Advisor

The student should select a faculty member to become her/his Major Advisor in the area of specialization they have chosen to pursue. The Initial Advisor (assigned by the department upon admission) may be selected as the Major Advisor. It is recommended that this decision be made prior to the student beginning their curriculum. The student should meet with the faculty member to discuss possible research projects, and request that the faculty member become her/his Major Advisor. Following the student's choice of an area of specialization and Major Advisor, the Major Advisor should indicate to the Graduate Administrator in writing acceptance of this role. If the student wishes to change advisor, he/she should gain agreement from the new advisor, inform the former advisor, and submit a written notification to the Graduate Administrator.

Thesis/Dissertation Committee

The Department requires all graduate students to establish an advisory committee, preferably before the end of their first year, but definitely before the end of the second year, and to meet regularly with the committee thereafter, at least annually. The advisory committee consists, at minimum, of the student's advisor(s) plus additional GES faculty member(s). Generally, the advisory committee will become the examining committee for a Thesis (M.S.) or Dissertation (Ph.D.), but the initial role of the advisory committee is to provide oversight and advice early in the graduate student's study.

Preliminary Exam

Ph.D. Students admitted to the graduate program take a suite of six courses in their first two years in residence. The "preliminary examination" in the Department of Geology & Environmental Science is based on the student's record of performance in these courses. Students will be considered to pass the preliminary exam when they have achieved a grade of B or better

in each of the courses. The student must take GEOL 2001 and GEOL 2468, in addition to three “core” courses from the list below, which are relevant to their research. In addition, students should take at least one course from a subfield markedly outside their research area but inside the department (e.g., one of the classes listed below). This course must be approved by the Graduate Committee to satisfy the “outside research area” designation. Because of the applicability of GIS and Remote Sensing to all research subfields, these classes do not count as “outside research area.” The list of six courses to be counted as the “preliminary examination” must be submitted to the Graduate Administrator and the Director of Graduate Studies at the end of the first semester. The six courses and the resulting grades will also be included in the Annual Review completed by each graduate student. Once all preliminary courses are complete, please reach out to the Graduate Administrator to have a milestone card signed and submitted. This completes the first DSAS milestone required for graduation.

The courses in the following list are offered at least once every other year. Other classes not on this list may be added upon approval of the student’s advisor and the graduate committee.

Course #	Course Name
GEOL 2001	Scientific Writing and Communication* GEOL 2002 Mineralogy-Petrology
GEOL 2049	Paleoclimatology
GEOL 2050	Surface Water Hydrology
GEOL 2054	Soils: Geobiochemical Landscapes GEOL 2060 Geomorphology
GEOL 2110	Plate Tectonics GEOL 2120 Basin Analysis
GEOL 2151	Groundwater Geology
GEOL 2309	Limnology
GEOL 2312	Environmental Law and Policy
GEOL 2446	Advanced GIS
GEOL 2449	GIS, GPS, and Computer Methods
GEOL 2460	Applied Remote Sensing & GPS Techniques GEOL 2461 Advanced Remote Sensing
GEOL 2468	Quantitative Research Methods in Earth Science* GEOL 2469 Topographic Analyses of Earth’s surface
GEOL 2470	Conservation Laws and Earth Surface Dynamics GEOL 2501 Organic/Stable Isotope Biogeochemistry
GEOL 2510	Aquatic and Sedimentary Geochemistry
GEOL 2520	Radiogenic Isotope Geology and Geochronology GEOL 2750 Volcanology
GEOL 3410	Exploration Geophysics
GEOL 3853	Watershed Biogeochemistry

*Course required for all students

Colloquium

All students must register for and attend the weekly departmental colloquium (GEOL 2015) during each term of residence.

Language Requirement

There is no language requirement for graduate degrees within the Department of Geology and Environmental Science.

Statute of Limitations

Requirements for graduate study must be fulfilled as follows: Extensions may be granted upon approval of the faculty. Extension of the statute of limitations will be granted only for exceptional circumstances. The request must be approved by the student's Dissertation Committee and the Graduate Committee Chair and submitted to the Associate Dean of Graduate Studies for final approval.

Master's Students

Students must complete all requirements for a master's degree within four consecutive calendar years of the first registration. **The Master's Comprehensive exam has a strictly enforced statute of four years and will not be extended for any reason.**

Ph.D. Students

Students must complete all requirements for the Ph.D. degree within ten consecutive years from the first term of registration. For students entering the program with a master's degree, the time limit is reduced to eight years, regardless of whether credits are transferred. **The Doctoral Comprehensive exam has a strictly enforced statute of seven years and will not be extended for any reason.**

Expected Rate of Progress through Graduate Milestones (MS & PhD)

Year	1			2			3			4			5			6			7		
Term	F	S	S	F	S	S	F	S	S	F	S	S	F	S	S	F	S	S	F	S	S
Preliminary Exam																					
MS																					
Thesis Committee																					
Conference Presentation																					
Thesis Defense																					
Pro-MS																					
Final Project																					
41 Credits Completed																					
PhD																					
Thesis Committee																					
Comprehensive Overview																					
PhD Candidacy																					
4 th Year Comm. Mtg.																					
Conference Presentation																					
Department Colloquium																					
Paper submitted																					
Dissertation Defense																					

Annual Review

The Dietrich School requires annual evaluations of all graduate students. Students will complete the G&ES Annual Student Review form, which provides a brief self-evaluation and report of accomplishments, and discuss it with their advisors. Note that a grade point average of ≥ 3.0 (B or better) must be maintained at all times to remain a graduate student in good standing. As part of the annual review:

- Students should supply a completed electronic copy of the form, a current curriculum vitae (CV) and OMET's should be emailed to the Graduate Administrator.
- Advisors will review the forms and provide an annual letter to their advisee. The letter will highlight your accomplishments for the academic year. The letter will also provide feedback on milestones and help ensure timely completion of your degree. The letter will be shared with the Graduate Administrator and the DGS. The DGS and Graduate Committee will review the annual letter written by the faculty advisor to make sure it meets the department standard. Once reviewed the letter will then be emailed to the student. The letter will also become a part of the student permanent record. If a student is

failing to make satisfactory progress, the student will be required to arrange a meeting with the Graduate Committee, where they will identify and discuss where the student is failing to make satisfactory progress; help the student to create a plan to remedy the deficiency; and provide encouragement and outline essential steps needed for a successful continuation.

- Failure to complete the annual review will result in a hold on your registration.
- Students should be sure to keep an electronic copy of your annual review, as it will facilitate completing the form for the next year and may also be useful in resume and job application assembly. Keeping hard copy of your review for your records is also recommended.

Ethics and Academic Integrity

The University of Pittsburgh has established policies regarding the high integrity with which all students, faculty, and staff are expected to conduct themselves and their research. The Student Code of Conduct can be found at: <https://www.as.pitt.edu/faculty/policies-and-procedures/academic-integrity-code>

Thesis/Dissertation Copies

Follow University of Pittsburgh requirements for electronic submission:

<https://www.asgraduate.pitt.edu/academics/graduation>

Dismissal from the Program

Graduate students can be asked to leave the program. This is referred to as a dismissal decision. This dismissal can result from multiple events: not maintaining a 3.0 GPA, not meeting graduate milestones, or not passing comprehensive exams. In particular, during the comprehensive exam process, there are several points where this can occur. The graduate committee can vote to fail a written comprehensive exam without the opportunity for a retake of the exam. The graduate committee can vote to fail an oral comprehensive exam. This oral comprehensive exam can be repeated once (with committee approval). If the retake of the oral comprehensive exam is a fail, that results in a dismissal decision.

The student has the right to appeal the dismissal decision. This section describes the appeal process used within Geology and Environmental Science (GES). There are two phases to the appeal, first a data gathering process, followed by a formal hearing if deemed necessary. In the case that the GES Work Committee upholds the dismissal decision, the student may appeal this decision to the Dietrich School Assistant Dean of Graduate Students and ultimately to the Vice-Provost of Graduate Studies.

Appeal of Dismissal from the Program

The Graduate Working Committee will consider the appeal, led by the Director of Graduate Studies. If the Director of Graduate Studies (DGS) is part of the committee that advises the student receiving the dismissal notice or is otherwise in conflict of interest, they cannot serve as the presiding official during the appeal process as described below. In this case, the Graduate Work Committee will select an alternative presiding official who is not in conflict of interest to preside over their deliberations. All other members can recuse themselves from the consideration

and/or voting if they feel they are in conflict of interest.

1. The Department will provide copies of all letters and other official correspondence sent by the department to the student and to the Graduate Work Committee, including the final letter indicating a dismissal decision. The GES DGS/presiding officer may ask the department and/or student to provide additional materials relevant to the case (e.g., milestone documents, academic records).

2. The student should provide a written summary of why they believe the dismissal decision should be reversed. The summary should also describe plans for improving the student's status should the appeal be successful, including detail about whether the student plans to continue working with the current advisor or a new advisor. These plans should identify a viable path to completing their degree (including details on funding, committee composition/participation, etc. going forward). If a new advisor is part of this plan, the student should describe any steps taken to identify a suitable faculty member. In general, this summary should be less than 4 pages (single spaced).

3. The student may also provide supporting materials or documentation that are relevant to help make the case. For instance, this could include letters from individuals informed about the student's personal history and capacity for graduate study, evidence of extenuating circumstances, relevant updates that indicate a change in the student's ability to conduct graduate-level work, etc. The student may wish to consult with the DGS/presiding official to determine the suitability of potential materials and documentation.

4. The student may request that additional relevant parties be given the opportunity to participate in the evaluation meeting (e.g., clinical care providers with an informed opinion, a prospective advisor). This should take the form of a written or electronic request to the DGS/presiding official. The DGS/presiding official shall make decisions about which individuals shall be approved attendees at the evaluation meeting. The DGS/presiding official may choose to invite additional relevant individuals (e.g., the student's current advisor is a likely invitee). The student shall be informed about all planned attendees.

Following the gathering of an appeal case, the process proceeds as follows:

1. The prepared materials from the department and student will be circulated to all members of the Graduate Work Committee. The DGS/presiding official shall poll these individuals to determine whether they are in favor of proceeding to an evaluation meeting to hear the case. If none are in favor of a meeting, the appeal shall be considered unsuccessful.

2. If a single member of the Graduate Work Committee votes in favor of proceeding with an evaluation meeting, the DGS/presiding officer and members of the Graduate Work Committee (or approved delegates) must attend the meeting. All of these potential attendees will have the right to vote in the final appeal. Ideally, the meeting will be held before a dismissal decision is scheduled to take effect. If this is not possible, the dismissal decision will be temporarily waived and in the meantime the DGS will place the student on Provisional Status within the department or University Academic Status. The evaluation meeting will then be scheduled as early as possible thereafter.

3. The student shall be given the opportunity to attend the evaluation meeting, present the case,

and respond to any questions. As described above, the meeting may also include additional attendees requested by the student or invited by the DGS/presiding official. The DGS/presiding official will moderate the meeting and make decisions about which attendees shall be present for which portions of the meeting. The meeting will conclude with a secret ballot by all attendees with voting rights. A simple majority must vote in favor (excluding abstentions) for a successful appeal. A tie vote will be regarded as an unsuccessful appeal. These proceedings will be summarized and shared with the student and the graduate dean's office.

Graduate Appointments (GSR/GSA/TA/TF)

There is a ***Graduate Teaching Assistant Mentor*** who is a resource for graduate teaching assistants seeking to improve their instruction and overcome challenges common in teaching.

Students admitted with provisional status are not eligible for a teaching assistantship.

The Department attempts to provide financial assistance to graduate students in good standing through teaching and research assistantships. Teaching Assistants (“TAs”), Teaching Fellows (“TFs”) and Graduate Student Assistants (“GSAs”) at the University of Pittsburgh are graduate students who are receiving financial support while gaining invaluable teaching and other educational experience under the guidance of faculty mentors. The primary purpose of teaching, from the standpoint of the University and the student, is for students to make steady progress toward an advanced degree, become a valuable member of the academic community, and gain valuable professional experience. TA/TF/GSA status is dependent upon being enrolled at the University as a graduate student. The University uses the following descriptions to define and differentiate TAs, TFs, and GSAs.

Teaching Assistant: A graduate student who holds a teaching or teaching-related appointment made in accordance with the University regulations pertaining to TAs. TAs often assist faculty with teaching classes, such as large lecture classes with recitation or lab sections. TAs should not be assigned to teach post-baccalaureate or graduate courses or be the instructor of record. Exceptions may be made only in rare cases where the student shows clear evidence of outstanding knowledge in specialized areas and when the individual is directly guided by a member of the graduate faculty.

Teaching Fellow: The same as a TA except that a TF is more educationally advanced or experienced, typically holding the equivalent of a master’s degree. TFs are responsible for teaching a significant portion of a course for their own advanced academic and professional training and may be the instructor of record. TFs should not be assigned to teach graduate courses. Exceptions may be made only in rare cases where the student shows clear evidence of outstanding knowledge in specialized areas and when the individual is directly guided by a member of the graduate faculty.

Graduate Student Assistant: A graduate student who assists in the educational or research mission of the University that support the student’s academic and professional development, but does not teach a class, recitation or laboratory.

For more information, please review the regulations here:

<https://www.gradstudies.pitt.edu/sites/default/files/assets/TA-TF-GSA-Academic-Regs-6-1-22-x.pdf>

and the information here:

<https://www.asgraduate.pitt.edu/financial-support/teaching-and-research-appointments-tatfsgsagr>

Graduate Student Researchers: Graduate Student Researchers (“GSRs”) at the University of

Pittsburgh are graduate students who are receiving financial support from external or internal research funds while they are full-time students working toward their degree. The research performed is an integral part of the student's training, thesis and/or dissertation. The goal of the appointment, from the point of view of both the University and the student, is for students to make steady progress toward an advanced degree, become a valuable member of the academic community, develop the skills necessary to complete their academic program, and gain valuable professional experience. GSR status is dependent upon being enrolled at the University as a graduate student.

For more information, please review the regulations here:

<https://www.gradstudies.pitt.edu/sites/default/files/assets/GSR-Academic-Regs-6-1-22-x.pdf>

and the information here: <https://www.gradstudies.pitt.edu/sites/default/files/assets/TA-TF-GSA-Academic-Regs-6-1-22-x.pdf>

Several graduate fellowships and scholarships are also available at the University level.

(<https://www.asgraduate.pitt.edu/financial-support/fellowships-internal>) These include, but are not limited to, the following:

Andrew Mellon Predoctoral Fellowships

These fellowships are awarded to doctoral students of exceptional promise and ability across the disciplines. Application materials will be forwarded to PhD students by the Graduate Administrator and Director of Graduate Studies.

Alfredo D. and Luz Maria P. Gutierrez Predoctoral Fellowship

Fellowships are awarded to graduate students of exceptional ability and promise whose research is focused on Latin America; nominees must be in the first three years in a Ph.D. program. Application materials will be forwarded to PhD students by the Graduate Administrator and Director of Graduate Studies.

Leo B. and Teresa Y. Wegemer Endowed STEM Fellowship

Established to support students of exceptional promise in their pursuit of high impact scientific research. Fellowship grants will be awarded to support the research of two exceptional, current, full-time students who are pursuing a Ph.D. degree in Dietrich School of Arts and Sciences STEM fields. The following departments will be eligible to nominate up to two students for consideration: Biological Sciences, Chemistry, Geology & Environmental Science, Mathematics, Neuroscience, and Physics & Astronomy.

For more information, please review the regulations here: <https://www.provost.pitt.edu/policy-statement-predoctoral-fellows-and-trainees>.

In addition, funding for graduate degree programs is available through a number of federal sources, including but not limited to:

- NSF Graduate Research Fellowship Program
- NASA Future Investigators in NASA Earth and Space Science and Technology

(FINESST) Fellowships

- NDSEG National Defense Science and Engineering Graduate Fellowships
- DoD SMART Scholarship

The Department of Geology and Environmental Science also provides small awards for graduate research and fieldwork from the Henry Leighton Memorial Scholarship Fund, the Christopher Hapke Memorial Planetary Award, the Dr. J. Frederick and Ann Sarg Research Award, and the Gary Sitler Graduate Award. These awards are based on a combination of merit and need.

Master of Science (M.S.)

The Master of Science degree requires completion of a minimum of 30 credits, of which 12 must be formal lecture classes.

The student must present a thesis showing marked accomplishment in some part of the field of his or her major subject as well as competency in the methods and techniques of scientific investigation. The thesis is to be the result of an independent investigation conducted by the student with an oral defense conducted at the end of the project. All MS theses shall serve as sources of published material.

Course Requirements

The minimum requirement for the M.S. degree is thirty (30) credits beyond the baccalaureate. These include lecture, laboratory, seminar, and topics courses, and research credits. A minimum of twelve (12) credits must be from formal courses taken within the Department of Geology and Environmental Science. GEOL 2990 (Independent Study) and any course numbered below 2000 may *not* be applied towards graduation requirements. Courses taken at the University of Pittsburgh while not enrolled in a graduate program do not count toward M.S. graduation requirements.

A minimum grade point average of 3.0 must be maintained for all formal courses taken. Students with full graduate status will be placed on academic notice if the cumulative grade point average falls below the 3.0 level.

Thesis Committee

The student's Thesis Committee will consist of at least three persons responsible for scientific guidance and research oversight. The chair of the Thesis Committee is the Major Advisor of the student, and at least two other members must be graduate faculty from the Department of Geology and Environmental Science.

A meeting with the Thesis Committee should be scheduled by the student for the end of the Spring term of the student's first year, and at least once a year thereafter. At the meeting, the student will provide a short overview of the research goals and objectives of her/his research. The presentation will be followed by a discussion of research directions and progress.

Thesis

Each M.S. candidate must prepare a thesis demonstrating successful completion of the research project as well as competency in the methods and techniques of scientific investigation in the field of her/his area of specialization. The thesis must be clearly, logically, and carefully written. The thesis should contain an introductory statement, including appropriate justification of the research, a description of methods and observations of the investigation, evaluation of the significance and meaning of the results, and a final summary. The Major Advisor must approve the content, format, and grammar prior to submission of the thesis to the Thesis Committee.

The Major Advisor should also ensure that the thesis is in acceptable form before requesting review by the Thesis Committee members. The thesis must be submitted to each member of the Thesis Committee at least two weeks prior to the thesis defense date. The members of the Thesis Committee will review and edit the thesis prior to the final thesis defense. The thesis should

serve as a source of publishable material.

All M.S. students must also present research their results at a meeting of a national or international scientific organization prior to the thesis defense.

Application for Graduation

Each candidate for graduation must file an official Application for Graduation with the Office of Graduate Studies early in the term in which graduation is expected. Students are required to register for at least one credit in the term of graduation when posting the dissertation defense milestone.

Thesis Defense

Each M.S. student must formally defend her/his submitted thesis. The student must provide notification of the defense at least two (2) weeks prior to the scheduled date to the Graduate Administrator, the Major Advisor, and each Thesis Committee member. The Graduate Administrator will then advertise the defense and notify the Assistant Dean of Graduate Studies. The defense is a public meeting, and the notice should therefore list the title of the thesis and the time and location of the event.

The Thesis Committee conducts the defense of the thesis. The student will begin the defense with a presentation summarizing her/his research topic and the results, which shall not last more than thirty (30) minutes. Following the oral summary and a general question-and-answer period, visitors will be asked to leave, and the student will then defend her/his research by answering questions posed by the Thesis Committee. Questions need not be confined to materials within and related to the thesis. The thesis will be formally accepted or rejected by the Thesis Committee at the time of the defense and the committee will decide what, if any, revisions should be made. A report on the results of the defense and on acceptance of the thesis, signed by each member of the Thesis Committee, must be submitted to the Associate Dean of Graduate Studies.

The Major Advisor is responsible for final approval of the revised thesis. After completion of the revisions, an electronic copy of the thesis must be submitted to the University Library System according to the specific requirements of the University's Electronic Theses and Dissertations Online System: <https://www.asgraduate.pitt.edu/academics/graduation>.
<https://www.asgraduate.pitt.edu/academics/graduation>).

Doctor of Philosophy (Ph.D.)

The Ph.D. is a research degree that represents the highest level of academic accomplishment in any field. Persons with this degree are expected to have demonstrated the ability to conduct independent research and should have the level and breadth of knowledge about their field that one could reasonably expect of someone who has attained the highest academic degree in their field. Research performance, evidenced by preparation of a dissertation on an independently pursued research topic, is the primary requirement for the Ph.D. degree. Each program is designed in consultation with a faculty advisor to meet the needs of the student.

The Doctor of Philosophy degree requires completion of 72 credits, of which 24 must be formal lecture and laboratory courses. Completion of a preliminary assessment examination is required in order to guide selection of remaining courses.

After selecting a research focus, each student takes a comprehensive exam that shows the breadth of knowledge needed to accomplish a Ph.D. and an overview exam that outlines the research scope of the dissertation. Each student must write and present a dissertation embodying an extended original investigation of a problem of significance in his or her field of specialization. The dissertation must add to the general body of knowledge or understanding in its field and be of sufficient importance to merit publication. The student will give an oral defense of his or her dissertation as well as a formal departmental seminar and a presentation at least one national or international conference. All Ph.D. dissertations shall serve as sources of published material.

Course Requirements

The minimum requirement for the Ph.D. degree is seventy-two (72) credits. These include lecture, laboratory, seminar, topics courses, and thesis research credits. A minimum of twenty-four (24) credits must be from formal courses and at least eighteen (18) of the credits must be taken within the Department of Geology and Environmental Science. No course numbered below 2000 may be applied toward graduation requirements.

A minimum grade point average of 3.0 must be maintained for all formal courses taken. Students with full graduate status will be placed on academic notice if the cumulative grade point average falls below the minimum grade point level.

If a Master of Science degree is awarded from the Department prior to admission, then at least forty-two (42) additional credits are required.

Transferring Credits

The University of Pittsburgh may allow the transfer of some credits into a doctoral program, dependent upon approval by the Associate Dean of Graduate Studies. Up to 30 credits of master's level work can be transferred toward the Ph.D. If a student has completed relevant graduate work beyond the master's level at another institution, up to 12 additional credits may be accepted for transfer. No more than 36 credits can be accepted for transfer from all other graduate institutions, subject to the restrictions set out in the Graduate and Professional Bulletin. As deemed appropriate, some or all of these credits may be used to satisfy formal course

requirements. The student must consult with her/his advisor in order to determine the appropriate number of transferable credits.

All petitions for transfer of credits earned at another institution should be made within the first year of graduate study at the University of Pittsburgh. Transfer credits come under the same statutes of limitations as other degree requirements. Requests for the transfer of credits that are older than 10 years for a doctoral degree must be accompanied by a clear justification addressing the current relevance of the credited material relative to the graduate degree sought at the University of Pittsburgh.

Dissertation Committee

The student's Dissertation Committee will consist of at least four persons responsible for scientific guidance and research oversight. The chair of the Dissertation Committee is the Major Advisor of the student, and at least two other members must be graduate faculty from the Department of Geology and Environmental Science. At least one additional committee member must be from another department within the University of Pittsburgh or from an appropriate program at another academic or research institution. It is not necessary to identify the external member at the initial evaluation, but the external member must be identified well prior to the time of the Dissertation Overview, as they are part of the Overview and time is required to obtain approval for external committee members. The external member is permitted to attend virtually. This permission will be granted when they are approved as a member by the Assistant Dean of Graduate Studies. . Membership of the Dissertation Committee must be approved by the Department Chair and the Assistant Dean of Graduate Studies by submitting the appropriate form to the Graduate Administrator. The membership of the committee may be changed if appropriate or necessary, subject to the approval of the Department Chair and the Dean. Students are required to schedule annual meetings with the Dissertation Committee.

Comprehensive Overview Examination

The intention of the comprehensive overview examination is to facilitate the student's progress toward publishing their first paper, while at the same time using the exams as a means to assess the student's research ability and accomplishments. The written portion of the exam constitutes a research proposal or manuscript, whereas the oral exam is comprised of a seminar-style presentation followed by verbal questions by the graduate committee. The comprehensive overview exam overall will incorporate assessment of "breadth" by both the committee assessment of the introductory and background sections of the writing sample, as well as during the questioning period of the oral exam. In addition to background assessment, the oral examination questions will focus on material directly related to the major field of research and the planned dissertation research and related subjects.

The written and oral comprehensive overview exams must be taken before the 7th semester of residence in the Ph.D. program, typically during third year. The written exam (i.e., the proposal or manuscript) **must be passed** before the oral exam. After passing both written and oral examinations (as well as the requirements of the preliminary exam), the student is admitted to "Ph.D. candidacy". Therefore, it is to the student's advantage to complete all requirements as soon as possible. However, the student does not need to complete all degree plan classes before

the comprehensive overview exams. In particular, examining committees can require additional course work be taken as an outcome of the oral comprehensive overview exam.

Comprehensive Overview Written Exam:

The written portion of the exam can be fulfilled with one of two options, the choice will be made by the student in consultation with their advisor and their committee.

- A research proposal (15 pages maximum including figures and references) based on the student's own research results.
- A full manuscript suitable for submission to the refereed literature combined with a *separate*, short 3-6-page proposal that outlines the dissertation plan and schedule.

Documents should adhere to standard formatting conventions. The balance of introductory information, preliminary data, and proposed research in the short proposal that accompanies the manuscript should be discussed with the student's advisor prior to the written exam. If the research proposal format is chosen, the student should follow the format of one of the major research granting agencies such as;

- The National Science Foundation (www.nsf.gov),
- Future Investigators in NASA Earth and Space Science and Technology (FINESST)
- The National Research Initiative Competitive Grant Program of the USDA (<https://www.nifa.usda.gov/grants/programs/competitive-AFRI-nonAFRI>)

For the comprehensive exam document, budgets, CVs, and other ancillary materials required by funding agencies are not necessary.

For the paper option, the intended journal target should be clearly identified in the document submitted to the committee.

The four-person examining committee for the written and oral exam must include the three faculty members from the GES department who serve on your advisory committee and one additional outside committee member. This milestone can be completed fully remote without prior approval.

- The advisor must read and approve the written portion of the comprehensive exam. After the written document is approved, send one complete copy to each committee member and the Graduate Administrator. The committee will have **two weeks to review the proposal**. You can **schedule your exam no earlier than 4 weeks** after handing your paper/ proposal to committee members. A signed cover page by all committee members (or email equivalent) indicating a 'pass' must be **submitted to the Graduate Administrator two weeks before the scheduled exam, or the scheduled exam date is dropped**.
- The committee will rate the written document and relay their ratings to the advisor and the rest of the committee as (1) pass, (2) pass with reservations (meaning that some rewriting is necessary), (3) fail but can retake, or (4) fail without the possibility of retaking the exam.

The results of the written examination are reported on the cover page of the proposal, signed by the committee and submitted to the graduate administrator 2 weeks prior to the oral exam. It is the student's responsibility to schedule the oral examination. The oral exam can be scheduled as soon as the written proposal is submitted to the committee; it cannot be scheduled sooner than one month from after submitting the written proposal. **If the graduate administrator does not have the approval of the written proposal 2 weeks prior to the oral exam, the oral exam will be cancelled.**

Comprehensive Overview Oral Exam:

The oral exam and its accompanying dossier is the last major milestone before Ph.D. candidacy. The oral exam consists of two parts:

1. Seminar-like presentation on your proposed dissertation research
2. Committee questions, which pertain to the presentation but also extend across your areas of expertise

It is the student's responsibility to find a time at which the committee can meet for the exam, to arrange an appropriate exam room, and to see that the necessary audio-visual facilities are available. This milestone can be completed fully remotely without prior approval.

The seminar presentation is open to all members of the faculty in addition to the committee and should include a description of the proposed work, the scientific basis and need for the work, and the progress made to date. The presentation should be scheduled to last no longer than 30 minutes, though it may last longer if the committee and faculty ask questions during the presentation. The question-answer phase may last for several additional hours. Oral exams usually take most of a morning or afternoon; a **minimum of three hours** should be reserved for this exam. Non-committee faculty members are allowed to stay for any/all parts of the oral exam. Committees and advisors vary somewhat in the way they conduct the question-answer part of the oral exam and in the amount of information they are willing to provide the student in advance. It generally is a good idea to meet with each member of your committee before the exam date to obtain their perspectives on what is expected. For example, one might ask each person 'How do you suggest I prepare for the oral exam?'

In addition to the background material related to their research direction, it is expected that students have good working knowledge of big-picture topics related to Earth and Environmental Science, appropriate to their degree stage and particular academic direction. The student should be prepared to:

1. Explain the importance of the research, describe future research plans and demonstrate knowledge of scientific principles behind any methods used.
2. Demonstrate knowledge of the fundamental concepts in core areas of geologic and environmental science, as well as in the student's areas of expertise.

Examining committees are established to protect the academic standards of the program, however their goal is to see that students succeed. No committee wishes to see a student fail. The committee might be interested in seeing you apply your knowledge to theorize answers to

questions to which you do not know the answer. Thus, while committee members may test the limits of a student's knowledge, the inability to answer every question will not automatically result in a failure.

At the conclusion of the examination, the committee discusses and votes on the outcome, following rules prescribed. The form to complete with below ratings and committee's signature will be in the student's file.

- Possible outcomes are pass, pass with reservations, or fail.
- The committee may decide to allow a student who fails the oral exam to retake it one more time.
- Pass with reservation indicates that the committee was not satisfied with some aspect(s) of the student's knowledge or preparation; however, this does pass the student to Ph.D. Candidacy. The specific deficiencies and requirements for rectifying these deficiencies (e.g., additional coursework, writing a review paper, etc.) must be explained to the student immediately after the exam, and a written explanation is provided on the exam report. The reservation must be lifted, by approval of the advisor and DGS, before the student can proceed to the final dissertation defense.

Admission to Candidacy

Following successful completion of the comprehensive examination, and completion of the dissertation overview, the student may apply to the Dean for Admission to Candidacy. Admission to candidacy constitutes a promotion of the student to the most advanced stage of graduate study and provides formal approval to devote exclusive attention to research and writing of the dissertation. Admission to Candidacy must occur at least eight (8) months before the dissertation defense.

Dissertation

Each Ph.D. candidate must prepare a dissertation demonstrating successful completion of the research project as well as competency in the methods and techniques of scientific investigation in the field of her/his area of specialization. The dissertation must be clearly, logically, and carefully written. The Major Advisor must approve of the content, format, and grammar prior to submission of the dissertation to the Dissertation Committee. The dissertation should contain an introductory statement, including appropriate justification of the research, a description of the methods and observations of the investigation, evaluation of the significance and meaning of the results, and a final summary.

The Major Advisor should ensure that the dissertation is in acceptable form before requesting review by the Dissertation Committee members. The dissertation must be submitted to each member of the Dissertation Committee at least two (2) weeks prior to the dissertation defense. The members of the Dissertation Committee should review and edit the dissertation prior to the final dissertation defense.

Each Ph.D. student must submit at least one manuscript to a peer-review journal prior to graduation and present research results at both a departmental colloquium and at a meeting of a national or international scientific organization.

Application for Graduation

Each candidate for graduation must file an official Application for Graduation within the Office of Graduate Studies early in the term in which graduation is expected, deadlines are announced each term. Students are required to register for at least one credit in the term of graduation.

Dissertation Defense

Each Ph.D. candidate must formally defend her/his submitted dissertation. The student must provide notification of the defense at least three (3) weeks prior to the scheduled date to the Graduate Administrator, the Major Advisor and each thesis committee member. The Graduate Administrator will then advertise the defense and notify the Associate Dean of Graduate Studies. The defense is a public meeting, and the notice should therefore list the title of the dissertation and the time and location of the event.

The student, dissertation chair and one other primary faculty member **MUST** attend in person. The other members may attend remotely. If the defense needs to occur in a different format, please contact the Graduate Administrator to obtain prior approval.

The Dissertation Committee conducts the defense of the doctoral dissertation. The student will begin the dissertation defense with a presentation summarizing her/his research topic and results that shall not last more than thirty (30) minutes. Following the oral summary and a general question-and answer period, visitors will be asked to leave, and the student will then defend her/his research by answering questions posed by the Dissertation Committee. The dissertation will be formally accepted or rejected by the Dissertation Committee at the defense and the committee will decide what, if any, revisions should be made. A report on the results of the defense and on acceptance of the dissertation, electronically signed by each member of the Dissertation Committee, must be submitted to the Dean of Graduate Studies for approval. Please contact the Graduate Administrator to initiate the milestone paperwork.

The Major Advisor is responsible for final approval of the revised dissertation. After completion of the revisions, an electronic copy of the thesis must be submitted to the University Library System according to the specific requirements of the University's Electronic Theses and Dissertations Online System: <https://www.asgraduate.pitt.edu/academics/graduation> . Please also contact the Graduate Administrator to complete the final milestone card of dissertation approved (if this date is different than the defense date).

Milestones:

1.) Preliminary Examination: successful completion of 18 credits from the approved Department of Geology and Environmental Sciences course listings. Please contact the Graduate Administrator when complete to initiate the milestone paperwork.

-department and DSAS milestone.

2.) Comprehensive Examination:

- Written Examination: the committee will rate the written document and relay their ratings to the advisor and the rest of the committee as (1) pass, (2) pass with reservations (meaning that some rewriting is necessary), (3) fail but can retake, or (4) fail without the possibility of retaking the exam. Please document this with the Graduate Administrator. -

department milestone.

- Oral Examination-successful oral defense of the written examination and makes you eligible for the application to Admission to Candidacy. Please contact the Graduate Administrator to initiate the milestone paperwork. -department and DSAS milestone.

3.) Admission to Candidacy- intertwined with milestone #2. Graduate Administrator will obtain your dissertation committee members approval on the application and submit to the Associate Dean of Graduate Studies for approval. When approved, the 8-month window begins on this date. -department and DSAS milestone.

4.) Dissertation Defense: successful completion of oral defense of the dissertation. Please work with the Graduate Administrator to initiate the milestone paperwork.
-department and DSAS milestone.

5.) Dissertation Approved: successful approval of these revisions. Please work with the Graduate Administrator to initiate the milestone paperwork.
-department and DSAS milestone.

Professional Master's (Pro-M.S.) in Geographic Information Systems (GIS) and Remote Sensing (RS)

Specific Goals of the Pro-M.S. Degree in GIS/RS:

The goal of this program is to train a new class of professionals with strong scientific and geospatial qualifications, as well as managerial and business skills. These future leaders and skilled professionals require analytical skills beyond what is offered by traditional curricula at the bachelor's or Master's level. The curriculum has been carefully designed to reflect the real-world requirements needed for careers in the geospatial sciences. The specific goals of the Program are:

- to take coursework across a wide range of disciplines in order to provide all skills needed for a professional position
- to solve a challenging problem using GIS/RS tools and data, becoming proficient in the software and analysis techniques
- to prepare and edit a working project document
- to present this history verbally
- to digitally-publish these data/results

General Information

The GIS/RS Professional-M.S. program in the Department of Geology & Environmental Science is a multi-disciplinary, multi-departmental, non-research degree. Designed to be completed in two academic years (plus one summer), the required courses are centered in the Geology and Environmental Science Department and focus on GIS and RS core proficiencies. Students are also required to take at least one course in the Schools of Business, Law, and Information Sciences. Flexibility is designed into the 41-credit program so that the student can tailor his/her coursework to fit specific future career goals and personal interests.

Curriculum

First Semester:

Skill Set Development: GIS and Remote Sensing fundamental principles & software use; communication proficiency; exposure to geospatial professionals

- GEOL 2449: Introduction to GIS and Computer Methods
- GEOL 1460/2461: Introduction to Remote Sensing
- COMMRC 1102: Organizational Communication
- GEOL 2015: Colloquium

Total Credits: 10

Second Semester:

Skill Set Development: advanced GIS/RS proficiency; computer programming; personalized elective expertise

- GEOL 2446: Advanced GIS
- GEOL 3946: Advanced ArcObjects Programming
- GEOL 2460: Applied Remote Sensing -- OR --
- FIRST FOCUSED ELECTIVE: *See below for detailed options*

Total Credits: 9

Summer Semester:

Skill Set Development: independent project experience utilizing geospatial analysis tools; compilation of digital dossier; oral/written presentation experience

- GEOL 3902: Directed Study: Summer Internship

Total Credits: 4

Third Semester:

Skill Set Development: statistical data analysis; methodology of information science; introduction to business administration

- PSYED 2014: Statistical Methods I
- INFSCI 2000: Introduction to Information Systems #
- BUSINESS: Business Elective
- SECOND FOCUSED ELECTIVE: *See below for detailed options*

Total Credits: 9

Fourth Semester:

Skill Set Development: advanced GIS/RS proficiency; awareness of comparative law; personalized elective expertise; data mining & database management

- LAW: Law Elective
- PSYED 2015: Statistical Methods II #
- GEOL 2460: Applied Remote Sensing -- OR --
- FIRST FOCUSED ELECTIVE: *See below for detailed options*

Total Credits: 9

an appropriate equivalent course may be substituted depending on the career goals of the student. See possible options below.

Focused Electives:

These two elective courses should be used to further focus the student's particular interests and career goals. The sequence must be approved by one of the Pro-M.S. Program Directors and should be focused in one specialization area (i.e., in one Department or School). Students are

encouraged to create their own sequence, but several example sequences and courses are listed below:

- Geological Sciences: Exploration Geophysics (GEOL 1410); Advanced Geohazards and Risk Management (GEOL 2640), Volcanology (GEOL 2750)
- Information Sciences: Statistics in Information Sciences (INFSCI 2060); Information Systems (INFSCI 2510); Software Tools and Techniques (TELECOM 2300)
- Advanced GIS Theory: Geographic Information Systems (INFSCI 1068); Advanced GIS (INFSCI 2720); Arcview Programming (GEOL 2447)
- Computer Programming: Visual Languages (INFSCI 2650); Programming for Web Applications (COE 1520)

Internship:

During the summer of Pro-M.S. student's first year, a 4-credit Internship (GEOL 3902) will be completed. With the assistance and approval of the Program Directors, the student will work in the business environment and utilize his/her geospatial skills. During this internship a digital dossier will be compiled and include the final published report, database dictionary, and georeferenced workspace. The written report must include: an executive summary, introduction, description of GIS/RS/GPS methodology, spatial and tabular analysis, conclusions, references and any appendixes. The database dictionary must include all images, spatial, map, and attribute metadata in a standard format. The student must also present an oral summary and description of project during the semester following their internship.

Law Elective:

One mandatory course centered in comparative or electronic law is required for the Pro-M.S. degree. There are a large number of possibilities including courses offered at the University of Pittsburgh Law School, as well as several other Universities in the Pittsburgh area.

- University of Pittsburgh: Intellectual Property (LAW 5260); Copyright Law (LAW 5328); Cyberspace and the Law (LAW 5404)
- Duquesne University: Intellectual Property: Trademark and Copyright Law (C208)
- Carnegie Mellon University: Ecommerce Law and Regulation

Substitutional Electives:

Depending on the skill set of the student, times of scheduled offerings within other schools at the University, and permission of the Program Directors, students may substitute certain courses for those designated.

- INFSCI 2000: Statistics in Information Sciences (INFSCI 2060); Information Systems (INFSCI 2510); Database Management (INFSCI 2710)
- PSYED 2015: Data Mining (STAT 2270); CMU: Mining Data for Decision Making (45-963)