

Graduate Student Guidebook

Department of Earth and Planetary Sciences (EPS)

For Students Admitted Academic Year 2018-2019 or Later
Last Revised September 19, 2018

The EPS Graduate Guidebook contains department-specific policies and procedures that supplement the rules set by The Graduate School (TGS). Students are subject to the regulations in effect at the time of matriculation. It is the responsibility of the student to be aware of these and TGS regulations.

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Introduction

This *Guidebook* summarizes the departmental programs and requirements for graduate students in Earth and Planetary Sciences. The Department of Earth and Planetary Sciences (EPS) is part of the Weinberg College of Arts and Sciences. The academic life of graduate students is, to a large degree, guided by the rules of The Graduate School (TGS), the administrative unit for all graduate programs at Northwestern. Each department has its own supplementary rules concerning the fulfillment of the requirements for graduate degrees. Additional information about university policies relating to graduate students can be found in the following electronic publications (available through TGS Web Site):

The Graduate School (TGS) is located in the Rebecca Crown Center at 633 Clark Street
www.tgs.northwestern.edu

The Graduate School – PhD Degree Policies
www.tgs.northwestern.edu/about/policies/phd-degree-requirements.html

The Graduate School – Academic Services
www.tgs.northwestern.edu/academics/academic-student-services/index.html

- Masters and PhD Degree Requirements
- Leaves of Absence
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- Academic Integrity Policies and Violations
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Northwestern University Student Handbook,
<http://www.northwestern.edu/student-conduct/about-us/student-handbook/>

Class Schedules and course descriptions are available electronically via the online CAESAR system. You will need a NetID to log in.

www.northwestern.edu/caesar

The EPicentreS annual reports are also useful as you familiarize yourself with the department –
<https://www.earth.northwestern.edu/about/newsletter/>

While ample advice is available from faculty and staff to assist students in planning their academic and research programs, ***it remains the responsibility of the student to know the University and department rules and meet all the requirements and deadlines.***

Disclaimer: Northwestern University reserves the right to change without notice any statement in this publication concerning, but not limited to, rules, policies, tuition, fees, curricula, and courses.

Program Administration

Position	Name	Office	Phone	E-mail*
Department Chair	Matt Hurtgen	F392/393	1-7539	<i>matt@earth</i>
Director of Graduate Studies	Suzan van der Lee	F494/495	1-8183	<i>suzan@earth</i>
Assistant Chair	Patricia (Trish) Beddows	F295/296	1-7460	<i>patricia@earth</i>
Business Administrator	Lisa Collins	F377	7-1002	<i>lisa@earth</i>
Program Assistant	Robin Stark	F374	1-3238	<i>robin@earth</i>
Financial Assistant	Ben Rice	F374	1-8190	<i>ben@earth</i>
Ombud	Yarrow Axford	F394/F395	7-2268	<i>yarrow@earth</i>
Ombud	Steve Jacobsen	F297/F298	7-1825	<i>steve@earth</i>

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Academic Program

EPS General Requirements

All graduate students are expected to have minimum levels of proficiency in basic science and mathematics before undertaking their graduate studies. To satisfy departmental general requirements for the PhD program, ***students must have completed any combination of FOUR from the following SIX options*** before qualifying for candidacy:

- A) One year of **Calculus** through calculus of several variables, equivalent to MATH 220-0, MATH 224-0, and MATH 230-0;
- B) Elementary **Differential Equations**, equivalent to MATH 250-0; OR **Statistics** through multivariate methods, equivalent to a course sequence such as STAT 320-1 plus ANTHRO 362-0.
- C) One year of calculus-based **Physics**, equivalent to PHYSICS 135-1, 135-2, and 135-3;
- D) One year of **Chemistry**, equivalent to CHEM 110-0, 151-0, 152-0, with labs.
- E) **Thermodynamics and/or kinetics** (advanced physical chemistry), equivalent to CHEM 342-1, EARTH 302-0, MAT_SCI 314-0, CHEM 303-0, CHEM 329-0, or CHEM 342-3.
- F) One year of **Biology**, equivalent to BIOL 215-0, 217-0, 219-0, with labs.

All students are encouraged to gain literacy in scientific computer programming (e.g., Python (taught in EARTH 361-0), R, or another high-level programming language); ***some courses require programming knowledge*** (e.g., EARTH 323-0, EARTH 353-0).

First-year graduate students may take a maximum of half of their total credits in any given quarter as EARTH 499 (Independent Study). (www.tgs.northwestern.edu/academics/registration-and-courses.html).

Spoken English Proficiency

TGS requires students to demonstrate proficiency in spoken English before they become teaching assistants, receive a Master's Degree, or take the Qualifying Examination. The Graduate School, along with the Department of Linguistics will test all incoming international students, and make a recommendation for any needed coursework in English as a second language (ESL).

<http://www.tgs.northwestern.edu/funding/assistantships/graduate-and-teaching.html>

Teaching Requirement

Teaching experience is a crucial aspect of graduate student training and is generally required of PhD students during their time in the program. Effort is made to exempt first year students, students in the final stages of dissertation writing, and students with externally funded fellowships, but at times members of these groups are needed to fully staff departmental TA positions. Graduate students lead discussion or lab sections, grade homework and exams, and occasionally present class lectures. Our students have found teaching experience to be a valuable asset, and potential employers, especially in academia, commonly inquire about the quality of teaching performed by job applicants.

The Searle Centre for Advanced Learning and Teaching provides opportunities for graduate students to develop teaching skills throughout the year. <http://www.northwestern.edu/searle/programs-events/grad/index.html>

Of particular value is the New TA Conference held in September of each year, which all students should attend before being assigned to a TA position. First year students may attend even if not yet assigned as a TA, but all students entering their second year should register and attend.

<http://www.northwestern.edu/searle/programs-events/grad/new-ta-conference/index.html>

The Course and Teacher Evaluation Council (CTEC) collects teaching evaluations for every class, with evaluations of graduate TA's included in these reports. The CTEC results may be accessed online after grade submission for a course. With appropriate interpretation, CTEC can help improve quality of teaching.

A teaching portfolio is a commonly required component of the application package for academic positions. Student evaluations of teaching in CTEC's provide this component of a comprehensive teaching portfolio. It is often best to collect CTEC and other materials for a teaching portfolio as they are generated.

Master's Degree

Students who pass the PhD Qualifying Examination may apply to receive a Master of Science (MS) degree from TGS. Students who do not achieve PhD candidacy by passing the qualifying exam may also earn the MS degree, pending approval of the faculty. In each case, the student must meet requirements for the MS degree established by TGS and EPS. Graduate School requirements are summarized and MS degree completion forms are found on the TGS website at:

<http://www.tgs.northwestern.edu/about/policies/masters-degree-requirements.html>

Departmental requirements for the MS Degree in Earth and Planetary Sciences include the following:

- A) Twelve courses from among those bearing graduate credit in science or engineering.
- B) A Master's thesis approved by the student's Advisory Committee. The thesis is ordinarily the result of Independent Study course work (EARTH 499) taken by the student within the required

12-course total and should be formulated as a manuscript of publishable quality, submitted or ready for submission to a geoscience journal.

Note:

- ***TGS stipulates that no more than one-third of the courses qualifying for credit can be Independent Studies (Earth-499).***
- ***The Earth-590 Research is the only course for which the Pass/No Pass option is acceptable.***

PhD Degree Requirements

Students in the PhD program should enter with a background in basic sciences and mathematics as noted above. Any deficiencies should be made up as soon as possible after admission to the program.

The department's specific PhD requirements complement the more general TGS degree requirements as set out at the TGS website:

<http://www.tgs.northwestern.edu/about/policies/phd-degree-requirements.html>

The aim of these requirements, in addition to providing the training necessary for your graduate research, is to develop professional breadth through exposure to different areas of faculty expertise, to provide a deeper knowledge of other scientific and/or engineering disciplines, and to encourage acquisition of complementary knowledge and research skills.

The PhD requires a total of 16 courses that should be taken within the first eight quarters of residence.

These courses are grouped into three categories as follows:

- Group A)** Six 300- level courses in Earth and Planetary Sciences, taken with regular letter grades;
- Group B)** Two 300- or 400-level courses in mathematics, statistics, natural sciences or engineering, taken with regular letter grades;
- Group C)** Eight other courses bearing graduate credit in science or engineering, including Independent Study courses (499's), and other courses in Earth and Planetary Sciences. Other courses may be considered towards fulfillment of group C by written petition to the Director of Graduate Studies. A maximum of two non-EARTH courses may be taken in this group with a P/N (pass/no pass) option. ***Some graduate level courses completed to fulfill "General Requirements" may also be counted towards Group A, B, or C requirements upon approval of the Director of Graduate Studies.***

In addition, a **dissertation** under the direction of a faculty member and approved by a dissertation committee appointed by the Director of Graduate Studies is a requirement of the degree. See also the FINAL EXAMINATION section.

Transfer of Credit

Important rules concerning the transfer of credit for graduate work completed elsewhere are listed in TGS's General Degree Requirements and Policy and Course Catalog.

The student may petition the Director of Graduate Studies for a waiver of up to three courses, which will be counted toward the requirements of course group “C” or “B” for the PhD. In some circumstances, the student may also petition for the transfer of credit to be counted toward some of the six-courses in group “A.” The total number of credits that may be approved against the courses in group “C,” “B,” and /or “A” will not be greater than 3 courses. In such a case, the student will need to successfully complete a total of 13, not 16, courses before the Qualifying Examination.

The department reserves the right to require students with transfer credit to complete the full 16 courses required for PhD students.

Grades

The letter grade system employed at Northwestern University is explained at www.tgs.northwestern.edu/about/policies/general-registration-policies.html#grades

A maximum of two non-EARTH courses may be counted in Group C with a P/N (pass/no pass) option. All other courses, including Independent Study courses (499's), are to be taken for letter grades (A, B, C, or F).

The Graduate School requires that students maintain a B average to remain in good standing; that is, any C grade must be balanced by an A. If a student receives an F or fails to make up an incomplete grade (X or Y) within one year, the student will need to register in the future and pay the tuition at their own expense for the additional course.

Course Credit

Only courses listed by TGS in Caesar bear graduate credit (see image at right).

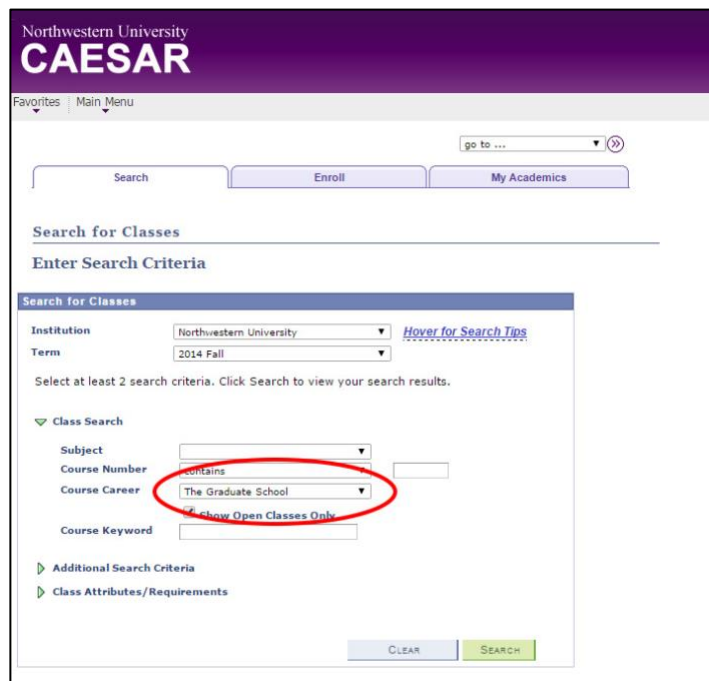
In sciences and engineering these are typically all 400-level and most 300-level courses. Be aware that not all 300-level courses bear graduate credit. Courses with 100 or 200 codes do not bear graduate credit.

Students taking courses to obtain the minimum proficiency levels in mathematics and science must also take at least three approved graduate courses each quarter to maintain registration and eligibility for financial support.

Residency

The Graduate School requires eight quarters of residency, which is defined as full-time study, to be completed consecutively over two years (including summers).

The Graduate School will not award any residency credits for work completed outside the Northwestern Graduate School.



The image shows a screenshot of the Northwestern University CAESAR system. The page title is "Northwestern University CAESAR". Below the title, there are navigation links for "Favorites" and "Main Menu". A search bar is present with a "go to ..." dropdown. Below the search bar, there are three buttons: "Search", "Enroll", and "My Academics". The main content area is titled "Search for Classes" and "Enter Search Criteria". There are two dropdown menus for "Institution" (set to "Northwestern University") and "Term" (set to "2014 Fall"). Below these, there is a prompt: "Select at least 2 search criteria. Click Search to view your search results." Under the "Class Search" section, there are several dropdown menus: "Subject", "Course Number" (set to "contains"), "Course Career" (set to "The Graduate School" and circled in red), and "Course Keyword". There is also a checkbox for "Show Open Classes Only". At the bottom, there are "Additional Search Criteria" and "Class Attributes/Requirements" sections, and "CLEAR" and "SEARCH" buttons.

Students who have completed PhD course requirements but need to fulfill residency in a given quarter (prior to the qualifying exam) should register for TGS 590.

Academic Integrity

Students need to maintain and promote academic integrity at all times. The University policies with respect to academic integrity can be found at the following sites:

<http://www.northwestern.edu/provost/policies/academic-integrity/>

<http://www.weinberg.northwestern.edu/undergraduate/courses-registration-grades/integrity/>

<http://www.tgs.northwestern.edu/about/policies/academic-integrity.html>

Responsible Conduct of Research Training (RCR)

All graduate students must complete the Responsible Conduct of Research training in their first year of the program. This training includes online "CITI" modules and face-to-face discussion sessions. New students should contact Assistant Chair Beddows about RCR training.

The Prospectus (Dissertation Proposal)

Students must have a dissertation proposal approved by their Graduate Advisory Committee no later than the beginning of the fifth year of study, to remain in good academic standing. Any student not meeting this milestone will be considered not in good standing and therefore will not be eligible for fellowships, traineeships, teaching or research assistantships, and scholarships. Students who do not meet published requirements of satisfactory academic progress may be excluded from TGS. A petition for extension of the prospectus deadline may be approved by TGS under certain circumstances, such as medical or family leave.

The prospectus must be approved by the graduate committee, comprised of a minimum of two Northwestern University graduate faculty members. The PhD Prospectus form is submitted by the student via the online CAESAR system after they have passed their Qualifying Exam (see below).

Good Academic Standing & Exclusion Policies

To be in good academic standing in The Graduate School, a student must meet both the standards set by the Earth and Planetary Sciences degree program and those set by The Graduate School ([information can be viewed here](#)). There are several sets of criteria that EPS takes into account in determining whether or not students are making satisfactory academic progress and are in good academic standing. It is important to note that in some instances the criteria for determining a student's academic standing in EPS are more strict than those established by TGS (noted below).

- Grades and cumulative GPA: A student whose overall grade average is below B (3.0 GPA) or who has more than two incomplete (Y or X) grades is not making satisfactory academic progress and will be placed on probation by EPS. (Note: This policy differs from TGS, which sets the number of incomplete grades at three rather than two.)
- Milestone deadlines: Doctoral students who have not been admitted to candidacy (have not passed the Qualifying exam) by the end of their second year are not making satisfactory academic

progress and will be placed on academic probation by EPS. (Note: This policy differs from TGS, which states that students must be admitted to candidacy by the end of their third year.)

- Program length: Doctoral students must complete all requirements for the PhD within nine years of initial registration in The Graduate School. Students who do not complete degree requirements by the established deadline will be placed on academic probation by EPS and TGS.
- Failure to make satisfactory academic progress may also be a result of, but not limited to: poor performance in classes, unsatisfactory performance on qualifying exams, unsatisfactory research progress, unsatisfactory progress in writing the dissertation, failure to communicate with program and/or advisor, failure to have a primary research advisor, or the inability to meet other program requirements (such as language proficiency).

Failure to make satisfactory academic progress as determined by either The Graduate School or The Department of Earth and Planetary Sciences will result in probation or exclusion (dismissal).

Cases of academic and/or research misconduct, discrimination or harassment, and inappropriate or unprofessional behavior are considered outside the boundaries of "satisfactory academic progress." Resources for these issues can be found here:

The Graduate School Academic Integrity policy:

<https://www.tgs.northwestern.edu/about/policies/satisfactory-academic-progress.html>

Office for Research Integrity:

<http://www.researchintegrity.northwestern.edu>

Office of Equal Opportunity and Access:

<https://www.northwestern.edu/equal-opportunity-access/index.html>

Student Handbook:

<https://www.northwestern.edu/student-conduct/shared-assets/studenthandbook.pdf>

Guidelines on the boundaries of professional behavior and misconduct are provided by the American Geophysical Union (AGU)'s [ethics policy](#).

The Graduate School's Academic Probation

When a student fails to meet any of the three sets of criteria established by The Graduate School [\(listed here\)](#) for maintaining satisfactory academic progress, the student will be placed on probation by The Graduate School.

The Graduate School will notify the student in writing, along with the program's Director of Graduate Study, and will be given at most two quarters (not including summer quarter) to resume satisfactory academic standing. The Graduate School notifies students of probation status on a quarterly basis.

During The Graduate School-imposed probationary period, students will remain eligible to receive federal and institutional assistance (except when they have exceeded their degree deadline). At the end of the probationary period, progress will be reviewed by The Graduate School. If a student does not re-

establish satisfactory academic standing during the two probationary quarters and does not successfully petition for an extension of the probationary period ([see here](#)), the student will become ineligible to receive financial aid and will be excluded (dismissed) from The Graduate School.

EPS Probation

When a student fails to meet any of the criteria listed above for maintaining satisfactory academic progress, the student will be placed on probation by the Department of Earth and Planetary Sciences. When a decision to place a student on probation is made by EPS, the student and The Graduate School will be notified in writing. A student will be given at most two quarters to resume satisfactory academic standing. At the end of the probationary period, progress will be reviewed by EPS. If a student does not reestablish satisfactory academic standing, the student will become ineligible to receive financial aid and will be excluded (dismissed) from the program.

No “Individual Exclusion/Dismissal” Policy - No exclusion from a program, or dismissal from a faculty research group may be made solely by an individual faculty member, but rather must require the approval of the program. Therefore, a faculty member who wishes to exclude or dismiss a student must make his/her case for exclusion and receive approval for this termination from both the program chair and the Director of Graduate Study. The reason for exclusion from a program or dismissal from a faculty laboratory must be made on the basis of the student’s inability to maintain good academic standing, as outlined by EPS and TGS policy.

If a student and/or primary research advisor believe at any point that the student would be better served by a different advisor, the student must identify another advisor or be subject to possible exclusion from the graduate program. In such a situation, the student must immediately contact the Director of Graduate Studies, who will consult with the faculty to determine a deadline by which the student must identify a new advisor. If a student has been deemed by the program to not have been making satisfactory academic progress, the student may be excluded from TGS according to stated policy.

Notification of Termination - When a decision to exclude is made, both the student and TGS must be informed of this decision in writing and sent the withdrawal document(s) within three business days. Students should be told clearly the reason(s) for their dismissal, and these reasons must be in line with written program and TGS guidelines.

Published Appeal Process – The appeal process for students who have been dismissed or excluded will follow existing appeal procedures [published by TGS](#). To appeal a program decision, students should submit a request in writing to the attention of the Senior Director of Student Services within ten calendar days of the date of the program’s final written determination of exclusion to the student and include any supporting materials at that time. If no appeal is filed within the ten-day period, the program’s decision becomes final and not subject to appeal.

Departmental Ombuds – Two faculty members are designated to provide impartial and informal assistance to students and staff with a concern, conflict, complaint, or other issue. In the academic year 2018-2019, these are Professors Yarrow Axford and Steve Jacobsen. Departmental ombudspeople, as are all other University employees, *are* obligated to report sexual misconduct to the University’s Title IX Coordinator. Truly confidential support for a sexual misconduct case can be found ([here](#)) via the University’s Office of Equity.

Financial Support

Students may be supported during the academic year by University Fellowships, Teaching Assistantships, Research Assistantships and Research Grants, as well as other (e.g., external) Fellowships. Internal awards and appointments are made by TGS acting on the recommendations of the department. Financial support is normally awarded for 9 months (3 quarters), providing a living stipend and covering the graduate tuition fees. Continuing financial support in the graduate program is contingent on satisfactory academic performance, which is evaluated by the departmental faculty each quarter. Twice a year, in the fall and spring, each student's advisory committee meets to review past accomplishments and future plans. At these times, decisions about the continuation of support are made.

- **University Fellowships** are provided by TGS and typically used for first-year graduate students.

- **Teaching Assistantships** are provided to students in any year. Teaching is an essential element of the education and training experience of PhD students at Northwestern. The Graduate School requires that all PhD students serve in some instructional capacity for at least one academic quarter during their graduate education at Northwestern. This teaching requirement is an integral aspect of professional development. The Graduate School strives to ensure that teaching demands are equitable across academic programs.

- **Research Assistantships** represent a principal source of financial support for students in all years.. Research Assistantships are obtained by faculty members from outside sources for research on specific topics. Research projects and financial support are arranged by mutual consent of the student and faculty members.

- **Sloss Fellowships** are supported by endowment funds.

- **Boos Fellowships** are supported by endowment funds and provide support to qualified female graduate students.

- **Health insurance** - All graduate students are required by the University to carry health insurance. The Department and TGS support the annual premium for a health insurance plan that is provided through the University.

TGS External Award Policy. TGS strongly encourages every graduate student to apply for funding from a source external to the University sometime before the end of his or her fourth year. Please follow this link for more details: www.tgs.northwestern.edu/funding/fellowships-and-grants/index.html.

Examples of awards include but are not limited to:

- NSF Graduate Research Fellowship: www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201
- US EPA – National Centre for Environmental Research Science To Achieve Results (STAR)
- Fellowships for Graduate Environmental Study: <http://www.epa.gov/ncer/rfa/>

- NASA Earth System Science Fellowship Program:
<https://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId=%7B1A7F0A8C-1126-EA39-6584-10DBD500C8AC%7D&path=open>
- **Minority Fellowships** from external sources can be found through TGS' external fellowships for minority students page at:
<http://www.tgs.northwestern.edu/diversity/fellowship-opportunities/index.html>
- Other fellowships can be found through TGS' fellowship and scholarship information pages at:
<http://www.tgs.northwestern.edu/funding/fellowships-and-grants/index.html>

Conference Travel

The primary responsibility for support of the student's research rests with the student's advisor. However, students who have completed three quarters of full-time registration may apply for a TGS Conference Travel Grant to assist PhD students traveling to conferences and/or seminars to make presentations on behalf of the University (<http://www.tgs.northwestern.edu/funding/fellowships-and-grants/internal-grants/conference-travel-grant/index.html>). Students are eligible to receive one grant up to \$600 per fiscal year and are eligible for a maximum of two grants over the entire course of their graduate career. See the [TGS website](#) for further eligibility requirements.

Additionally, TGS travels funds may be further supplemented by \$300 from the Department, upon written application to the Department Chair. The application email sent to the Chair and the Business Manager should include a copy of the research abstract, and be submitted ideally 60 days prior to the conference, but no later than one month beforehand.

For travel to a second annual meeting, departmental support of up to \$300 may be awarded upon application. In general, students should remind their faculty advisors that conference travel for presenters should be supported by the research grants funding their work. Students may also seek additional funding for conference attendance awarded on a competitive or need basis from sources such as the major professional associations (AGU, GSA, etc.).

NOTE: First-year students wishing to present research completed *prior* to arriving at NU must seek travel funds from former advisors or major professional associations such as AGU, GSA, and others.

Special Awards

The department recognizes excellent performance in teaching and research by graduate students. Our alumni have generously endowed the *Horace A. Scott Awards* for outstanding research, and the *Marion Sloss Award* to an outstanding Teaching Assistant. These awards are made at the spring graduation reception every year.

Students may also be eligible for other National or University awards, and these opportunities should be brought to the attention of the research advisor, the Director of Graduate Studies, or the Chair's Office so that nomination of the student may be considered.

Path to the PhD Degree

Advising

The first step in the advising process is for the student to meet with the Director of Graduate Studies shortly upon arriving on campus and determine whether all General Requirement prerequisites have been met, and if not, to plan appropriate coursework. A *Worksheet for PhD Requirements* is included at the end of this *Guidebook* to aid each student in academic planning. Please upload annual updated copies of this form to Graduate Student Tracking System under the tab “Documents”: <https://gsts.northwestern.edu/site/login>

Each newly admitted graduate student is assigned an initial faculty adviser based on research interests expressed in the graduate application. The faculty advisor works together with the Director of Graduate Studies to provide initial research and curricular consultation. During the first year, students should identify faculty advisors for their two qualifier propositions (usually, but not always, the initial faculty advisor becomes the primary dissertation advisor).

By the end of the first year the Director of Graduate Studies will appoint a qualifying exam committee consisting of the two proposition advisors and one additional faculty member, of which the primary and one other committee member must be Graduate Faculty at Northwestern. Students meet regularly with their primary advisor, and meetings of the entire committee to review course work and research activity are scheduled for the Spring and Fall quarters. Based on these meetings, summaries of student progress are logged using the GSTS online system, which will be reviewed and approved by the Director of Graduate Studies.

Students are encouraged to make progress in research work as soon as possible, and to choose a curriculum that provides needed training for their research. However, course work should also expand one’s knowledge beyond sub-discipline boundaries. Advisory committees will assist in guiding each student’s selection of courses.

In addition to regular appointments with their research advisors to discuss research, students are required to schedule two formal advisory meetings per year with their full advisory committee: the Fall meeting must be completed before the end of October, and the Spring meeting must be completed before the end of May.

One week prior to the scheduled meeting the student should provide each committee member:

- An unofficial transcript for pre-candidacy students;
- An updated *Curriculum Vita* including activities and accomplishments for the reporting period (i.e., since the last committee meeting);
- A summary of **academic** and **research** objectives for the reporting period, progress and results, and objectives for coming year.

All documents should be included in The Graduate Student Tracking System under the tab “Academic Progress”: <https://gsts.northwestern.edu/site/login>

During the meeting with the student, the committee chair will record the discussion in a brief synopsis to accompany the materials prepared by the student. This synopsis must be signed by all participants. Summaries of the meetings are to be filed with the Director of Graduate Studies and the departmental office. ***This system of documentation is a requirement of TGS -failure to file summaries by stated deadlines may result in suspension of departmental financial support.***

The members of the Advisory Committee can be changed by request of the student to the Director of Graduate Studies. Such requests should be made and approved in writing.

The Qualifying Examination

The Qualifying Exam consists of an oral defense of two written research propositions on different subjects, each prepared under the guidance of a different faculty advisor. The nature and scope of the two propositions are chosen and approved in consultation with the student's advisors and the Director of Graduate Studies. Propositions commonly are the result of the student's work in Independent Study courses (499's) and form the basis for future dissertation research. The oral examination itself focuses on the development of the research question, the significance of the research, the student's command of relevant and related disciplines, and the appropriateness of the methods used, as outlined in the propositions. For students entering with a Master's degree, one of the propositions may be based on their Master's thesis, but only with prior approval of the student's primary advisor and the Director of Graduate Studies.

As soon as practically possible, but no later than the end of the first year of residence, students should submit via GSTS the titles of the two research propositions they will defend in the Qualifying Examination, including the name of the advisor for each proposition. This is a requirement before scheduling of the Qualifying Examination can proceed. To schedule the Qualifying Exam, students should contact the Director of Graduate Studies and submit a completed Outline of PhD Requirements form.

Students entering with a Bachelor's degree are required to take the Qualifying Examination by the end of their seventh quarter in residence (the summer quarter is included in this calculation). Students entering with a Master's degree who wish to use the Master's research for one proposition must take the exam by the end of the sixth quarter of residence. All Qualifying Examinations must be completed prior to the end of the first month of the seventh quarter of residency. The Director of Graduate Studies will appoint an Examining Committee consisting of the two faculty supervising the propositions and one more faculty member. Propositions should be in the hands of the Examining Committee not less than 5 working days before the examination. The Qualifying Examination is open to departmental faculty, in addition to the members of the Examining Committee.

Foreign students from non-English-speaking countries must meet the minimum proficiency in English requirements as set by TGS before taking the Qualifying Examination.

Students who pass the Qualifying Examination are admitted to PhD candidacy by TGS. In the event of a failed examination, the student may be invited to retake the Qualifying Examination, no later than one quarter after the original exam. If the committee does not recommend a second exam, the student will be expected to leave the program by the end of the quarter, at which time financial support will cease.

Dissertation Research

Students should formally identify the research topic of the PhD dissertation as soon as practically possible, but no later than 3 months after having passed the Qualifying Examination. By that time the PhD candidate should file a brief statement in GSTS identifying the subject matter of the thesis, the name of the primary dissertation advisor, and an outline of the research involved. Submission are reviewed by the Director of Graduate Studies. The statement is not binding on the student as far as the field and nature of the upcoming research are concerned, but any substantive changes in topic or any change of dissertation advisor(s) must be submitted in writing to the Director of Graduate Studies as soon as such changes occur.

At the end of the sixth year after matriculation, each doctoral student must submit to TGS a statement of progress and timetable for completion of the dissertation, signed by the student and endorsed by the dissertation advisor.

The Final Examination

A completed dissertation must be read and approved by the primary dissertation advisor. It is subsequently read and approved by two or more additional faculty members, who, along with the principal advisor, constitute the Final Examination committee. One copy of the approved version of the dissertation must be placed in the Department Office for consultation by any member of the department faculty not less than 7 days before the Final Examination.

The Final Examination is an oral presentation held in an open-lecture format, and defense to the committee of the dissertation. Following the presentation, the thesis committee meets to decide on final approval of the thesis and recommendation to confer the degree.

All requirements for the PhD degree must be met within nine years of initial registration in the doctoral program. Thus, the Final Examination on a completed dissertation and the dissertation's submission to TGS must fall within this period.

Students who are completing their degree will submit the following TGS forms through the online CAESAR system:

- 1) Application for Degree;
- 2) Final Exam Form via which must be approved by the department;
- 3) NRC Survey of Earned Doctorates which will be sent to you by TGS.
- 4) Online submission of dissertation via UMI ProQuest. www.etsdadmin.com/cgi-bin/home

It is the student's responsibility to ensure that all requirements of TGS are fulfilled in order to graduate.

Deadlines and Extensions

The Graduate School mandates that all requirements for the PhD degree must be met within **nine years** of initial registration in a doctoral program. Thus the Final Examination on a completed dissertation and its subsequent submission to TGS in a required format must fall within this period.

A one-time extension of the deadline for two additional years may be granted by the Dean of TGS upon submission of an extension petition. The petition must be signed by the student and all members of the dissertation committee.

During the period of extension, the student is not required to be in residence or register for courses. However, a student who is supported by a scholarship, needs University health insurance, access to certain University facilities, or must meet registration requirements for foreign students, must register for TGS 503 Resident Research Continuation.

Timetable of the PhD Degree

START	Upon arrival, meet with the Director of Graduate Studies. Meet with various faculty to discuss research interests. Start courses, teaching, and research.
3 quarters from start	Submit to Director of Graduate Studies: 1) possible titles of propositions, 2) names of faculty advisors 3) anticipated date of Qualifying Examination 4) submit Worksheet for PhD Requirements and CV to EPS files
After 1 year	Preparation for Qualifying Exam: 1) consult your Advisory Committee and the Director of Graduate Studies about the appointment of the Examining Committee 2) studying and mentoring in preparation of the exam 3) book a date for Qualifying Exam
Spring Quarter of Year 2	Qualifying exam completed no later than the end of the first month of the Spring Quarter. Submit completed Worksheet for PhD Requirements and CV to EPS files.
~3 months after Qualifying Exam	Inform the Director of Graduate Studies of the selected PhD dissertation topic and research advisor.
5 years from start	Obtain approval from the department of your Prospectus (dissertation proposal). Submit your Prospectus to TGS via CAESAR online.
9 years from start	Final deadline for completion of dissertation. Final Examination. Submission of dissertation.
More than 9 years, but less than 11 from start	It is possible to petition TGS for a two year extension beyond the 9-year deadline.

Worksheet for PhD Requirements

All requirements must be completed prior to scheduling the Qualifying Examination.

Student _____

Start Date _____ Current Date _____

REQUIREMENT	COURSES	WHEN TAKEN	GRADE
Four of the following six:			
Calculus - Multivariate	_____	_____	_____
Differential Equ. or Statistics	_____	_____	_____
Physics	_____	_____	_____
Chemistry	_____	_____	_____
Thermodynamics or P. Chem	_____	_____	_____
Biology	_____	_____	_____
A) SIX REQUIRED	1. _____	_____	_____
300-level courses in Earth and Planetary Sciences	2. _____	_____	_____
	3. _____	_____	_____
	4. _____	_____	_____
	5. _____	_____	_____
	6. _____	_____	_____
B) TWO REQUIRED	1. _____	_____	_____
300- or 400-level courses in math, statistics, natural sciences or engineering	2. _____	_____	_____
C) EIGHT REQUIRED	1. _____	_____	_____
Other graduate courses, of which: - Maximum two P/NP grades - Minimum two 499 with two different faculty	2. _____	_____	_____
	3. _____	_____	_____
	4. _____	_____	_____
	5. _____	_____	_____
	6. _____	_____	_____
	7. _____	_____	_____
	8. _____	_____	_____

NOTE: Indicate any awarded transfer credits (max. 3) for graduate courses completed elsewhere.

PROPOSITIONS

Advisor _____ Title _____

Advisor _____ Title _____

Qualifying Exam Date _____

Course Registration Guidelines

Year 1	Fall	Q1	Typical enrollment is three or four graded courses, with three required to maintain full time status. In Year 1, a max of 50% of courses may be EARTH 499; only one EARTH 499 enrollment is possible when total enrollment is 3 courses.
	Winter	Q2	If a "placeholder" enrollment is required, then it may be possible to register for 1 or more credits of TGS 590, but typically should only be considered after a core of basic courses have been completed. Approval from the DGS is required for 590 registration during the academic year (ie not the summer).
	Spring	Q3	
	Summer	Q4	EARTH 590 for 3 units.
Year 2	Fall	Q5	Typical enrollment is three or four letter graded courses, with three required to maintain full time status. No limitation in the second year on EARTH 499 enrollments as long as other course requirements are fulfilled.
	Winter	Q6	If the necessary courses for the EARTH PhD program are completed (or not available in present quarter), then registration in EARTH 590 may be possible during the academic year with approval of the DGS.
	Spring	Q7	Qualifying exam to be undertaken in the first month of the Q7 / spring quarter of Year 2.
	Summer	Q8	If Qualifying exam passed in Spring Q, then register for TGS 500. If the Qualifying exam process and paperwork is not completed, then register for TGS 590 for the summer Q. All requirements of the Qualifying exam are ideally fulfilled in the Spring (7th) quarter, but if the Chair approves a recommendation by the committee for continuation in the summer, then completion of Qualifying exam requirement is typically needed 3 weeks before Fall quarter begins.
Year 3	Fall	Q9	Students with no courses, register for TGS 500.
	Winter	Q10	Students registering for one or two courses, must co-register with TGS 500.
	Spring	Q11	Only students registering for 3 or 4 letter grade courses need not register for TGS 500.
	Summer	Q12	All course requirements for a doctoral program must be completed by the end of the twelfth quarter.
Year 4 +	Q 13 and beyond	TGS 500	
If funding terminating		TGS 512	
If beyond limit of program		TGS 513	