Earth, Environmental, and Planetary Sciences, PhD

Doctoral Candidacy

To earn a PhD at Washington University, a student must complete all courses required by their department; maintain satisfactory academic progress; pass certain examinations; fulfill residence and Mentored Experience Requirements; write, defend, and submit a dissertation; and file an Intent to Graduate. For a general layout of doctoral degree general requirements in Arts & Sciences, including an explanation of Satisfactory Academic Progress, students should review the Doctoral Degree Academic Information page of the Arts & Sciences *Bulletin.*

Program Requirements

- **Total Units Required: 36**
- **Degree Length: Five years**
  - **Note:** Students must be enrolled in 9 graduate credits each semester to retain full-time status. As students complete their course work, if enrolled in fewer than 9 graduate credits, they must enroll in a specific Arts & Sciences graduate course that will show 0 units but does count as full-time status. Students should connect with their department to ensure proper enrollment prior to Add/Drop.

PhD in Earth, Environmental, and Planetary Sciences

The degree requirements for a PhD in Earth, Environmental, and Planetary Sciences are intended to ensure that all students develop independence and originality of thought and that they acquire knowledge of sufficient breadth and depth to be scientific leaders in the field. Students are required to complete eight courses, five of which must be taken in the Department of Earth, Environmental, and Planetary Sciences. Students entering with an AM degree in a closely related field may waive two of these course requirements if approved by the faculty.

Students begin research early in the program, completing a small project during their second semester. At this time, each student selects a faculty member to serve as their major advisor as well as two additional faculty members to provide further guidance; these three faculty members comprise the student's Research Advisory Committee. During their second year, students continue their research as they work toward the oral examination that occurs at the end of their second year, which requires the preparation of a research paper, an oral presentation of research results, and a question-and-answer session with the student's Research Advisory Committee. Students are also required to obtain experience in teaching during their studies. The PhD program culminates in the writing of a dissertation and its defense in an oral presentation.

Required Courses

It is recognized that students entering the program will bring a diverse background in their undergraduate course work. An adequate general foundation would be three semesters of calculus, a year of general physics, and a year of general chemistry; prior course work in biology is encouraged for students interested in the field of geobiology. Students have been successful in the program, depending on their discipline interests, with less than this level of preparation; however, two semesters of calculus constitutes a minimum mathematics background to be successful in the program. The first-year advisor and the Research Advisory Committee will determine a student's needs in physics, math, chemistry, and other fields and provide advice and direction on the means of removing deficiencies.

Students with no prior course work in Earth and planetary sciences are required to enroll in EEPS 202 Introduction to Earth, Environmental, and Planetary Science and EEPS 202L Introduction to Earth, Environmental, and Planetary Science Lab Section. Enrollment in EEPS 202 Introduction to Earth, Environmental, and Planetary Science will not fulfill a course requirement for the PhD or AM degrees. The PhD program is flexible in its course work requirement. It is not intended that a student will repeat her or his undergraduate experience. Those students with a strong background in Earth, environmental, and planetary sciences will be able to concentrate on research at a relatively early stage in the program.

The department requires the completion of eight courses, at least five of which must be in EEPS. All EEPS courses taken must be at the 500 level or above. For students entering without a degree in Earth, environmental, and planetary sciences or a closely-related field, EEPS 340 Minerals, Rocks, Resources and the Environment or EEPS 353 Earth Forces taken by enrolling in EEPS 590 Independent Study, will fulfill EEPS course requirements with advisor approval. In all other cases, EEPS 590 Independent Study will not meet a course requirement; EEPS 592 Research and EEPS 595 Seminar also do not fulfill course requirements. Courses taken outside the department are expected to be in the areas of science, mathematics, or engineering.

The student selects courses in consultation with her or his advisor and the Research Advisory Committee. The student and the advisor are responsible for ensuring that the selected courses provide breadth and depth of knowledge needed for the student to conduct graduate research and successfully finish the graduate program.

Students entering the graduate program who have previously received a master's degree in Earth, environmental, and planetary sciences or a closely related field may petition to waive up to two of the five required EEPS courses. This petition may be submitted no earlier than the second semester in residence and should contain a justification for the number of courses to be waived that identifies how previous course

work is similar to that offered by the department. The waiver must be endorsed by the student's Research Advisory Committee and forwarded to the Director of Graduate Studies. The petition will then be considered for approval by the Graduate Studies Committee.

Code	Title	Units
EEPS 592	Research	variable; max. 12

Qualifying Examinations

Progress toward the PhD is contingent upon the student passing examinations that are variously called *preliminary, qualifying, general, comprehensive,* or *major field exams.* The qualifying process varies according to the program. In some programs, it consists of a series of incremental, sequential, and cumulative exams over a considerable time. In others, the exams are held during a relatively short period of time. Exams may be replaced by one or more papers. The program, which determines the structure and schedule of the required examinations, is responsible for notifying the Office of Graduate Studies, Arts & Sciences, of the student's outcome, whether successful or unsuccessful.

Mentored Experience Requirements

Doctoral students at Washington University must complete a department-defined Mentored Experience. The Mentored Experience Requirement is a doctoral degree milestone that is notated on the student's transcript when complete. Each department has an established Mentored Experience Implementation Plan in which the number of units that a student must earn through Mentored Teaching Experience(s) and/or Mentored Professional Experience(s) is defined. The Mentored Experience Implementation Plans outline how doctoral students within the discipline will be mentored to achieve competencies in teaching at basic and advanced levels. Some departments may elect to include Mentored Professional Experiences as an avenue for completing some units of the Mentored Experience Requirement. Doctoral students will enroll in LGS 6XXX Mentored Teaching Experience or LGS 7020 Mentored Professional Experience to signify their progression toward completing the overall Mentored Experience Requirement for the degree.

The Doctoral Dissertation

A Research Advisory Committee (RAC) must be created no later than the end of the student's third year; departments may set shorter timelines (e.g., by the end of the student's second year) for this requirement. As evidence of the mastery of a specific field of knowledge and of the capacity for original scholarly work, each candidate must complete a dissertation that is approved by their RAC.

A Title, Scope & Procedure Form for the dissertation must be signed by the committee members and by the program chair. It must be submitted to the Office of Graduate Studies, Arts & Sciences, at least 6 months before the degree is expected to be conferred or before beginning the fifth year of full-time enrollment, whichever is earlier.

A Doctoral Dissertation Guide & Template that give instructions regarding the format of the dissertation are available on the website of the Office of Graduate Studies, Arts & Sciences. Both should be read carefully at every stage of dissertation preparation.

The Office of Graduate Studies, Arts & Sciences, requires each student to make the full text of the dissertation available to the committee members for their review at least 1 week before the defense. Most degree programs require 2 or more weeks for the review period; students should check with their faculty.

The Dissertation Defense

Approval of the written dissertation by the RAC is necessary before the student can orally defend their dissertation. The Dissertation Defense Committee that observes and examines the student's defense consists of at least five members, who normally meet these criteria:

- Three of the five must be full-time Washington University faculty members or, for programs offered by Washington University-affiliated partners, full-time members of a Washington University-affiliated partner institution who are authorized to supervise PhD students and who have appropriate expertise in the proposed field of study; one of these three must be the PhD student's primary thesis advisor, and one may be a member of the emeritus faculty. A fourth member may come from inside or outside the student's program. The fifth member must be from outside the student's program; this fifth member may be a Washington University research professor or lecturer, a professor from another university, or a scholar from the private sector or government who holds a doctorate and maintains an active research program.
- Three of the five normally come from the student's degree program; at least one of the five must not.

All committees must be approved by the Office of Graduate Studies, Arts & Sciences, regardless of whether they meet the normal criteria.

The committee is appointed by the Office of Graduate Studies, Arts & Sciences, upon the request of the degree program. The student is responsible for making the full text of the dissertation accessible to their committee members for their review in advance of the defense. Faculty and graduate students who are interested in the subject of the dissertation are normally welcome to attend all or part of the defense but may ask questions only at the discretion of the committee members. Although there is some variation among degree programs, the defense ordinarily focuses on the dissertation itself and its relation to the student's field of expertise.

Submission of the Dissertation

After the defense, the student must submit an electronic copy of the dissertation online to the Office of Graduate Studies, Arts & Sciences. The submission website requires students to choose among publishing and copyrighting services offered by ProQuest's ETD Administrator. The degree program is responsible for delivering the final approval form, signed by the committee members at the defense and then by the program chair or director, to the Office of Graduate Studies, Arts & Sciences. Students who defend their dissertations successfully have not yet completed their PhD requirements; they finish earning their degree only when their dissertation submission has been accepted by the Office of Graduate Studies, Arts & Sciences.

Academic Performance

All students are expected to maintain satisfactory academic performance as defined on the Academic Information page of this *Bulletin.* This includes completing all PhD requirements except for the dissertation by the fourth year; maintaining a cumulative grade point average of at least 3.0 with a 3.0 or better in all courses (excluding courses taken through the English Language Program); not carrying at one time more than 9 semester hours for which grades I, X, or N are recorded; and submission of a dissertation proposal — in the form of a completed Title, Scope, and Procedure Form — before beginning the ninth semester (fifth year) of continuous enrollment. The department imposes additional criteria:

- Students are expected to maintain a cumulative grade point average of 3.0 or higher exclusive of hours taken for research (EEPS 592 Research).
- Students are expected to take and successfully pass the oral examination by July 31 of their second year.
- Students are expected to make timely progress toward degree completion through the conduct of scientific research and the production of scholarly work (for example, peer-reviewed journal articles, conference presentations) at the level of excellence expected of a Washington University PhD.
- Students are expected to complete the requirements of mentored teaching experiences.
- Students in the third year and beyond are expected to hold annual review meetings with the Research Advisory Committee.

Students who do not maintain satisfactory academic progress may be put on probation or, in rare cases, face dismissal as described in the department's Plan for Supervising Academic Progress and the Office of Graduate Studies in Arts & Sciences Policy on Probation and Dismissal for Academic Reasons.

Funding

Graduate students have guaranteed secured funding for five years. The maximum duration for financial support by any of the funding sources administered by the department is normally as follows:

- For AM Candidates: Four semesters
- For PhD Candidates: 10 semesters

For PhD students, support provided by the Office of Graduate Studies is not available after 10 semesters in the program, although support may be provided through research grants or other resources if available. AM students are not eligible for financial support after four semesters in the program. Tuition scholarships are provided by the Office of Graduate Studies for up to 72 units of graduate-level course work. Most financial awards, including the financial aid administered by the department, are contingent on the maintenance of satisfactory academic progress.

Website:	https://eeps.wustl.edu/