

GEOSCIENCES, PHD

The Department of Geosciences offers the Doctor of Philosophy (PhD) degree program, which is designed to produce scholars capable of independent research that deepens humanity's understanding of science, as well as practitioners capable of applying their training to achieve sound and pragmatic solutions to real problems in the field. As a PhD student, you will become an expert and scholar in your field who is starting to generate an international reputation as an independent scientist that can devise and conduct creative research, mentor and teach, and contribute to the advancement of your field. Students in the doctoral program will normally spend four years completing their degree.

The Geosciences PhD program provides our students with a strong scientific background and intensive research experience, culminating in a formal dissertation. The PhD degree requires both coursework and research. These help the student build observation, critical thinking, quantification, and presentation skills. Our goal is for students to gain deep knowledge in a subfield of geosciences and a broad understanding of the overall discipline. We strive to prepare students for scientific careers in academia, government, or industry.

Admission Requirements

Application Deadlines

Application deadlines vary by program, please review the application deadline chart (<http://uwm.edu/graduateschool/program-deadlines/>) for specific programs. Other important dates and deadlines can be found by using the One Stop calendars (<https://uwm.edu/onestop/dates-and-deadlines/>).

Admission

To be considered for admission to the program, an applicant must meet Graduate School requirements (<http://uwm.edu/graduateschool/admission/>) plus the following program requirements:

1. Hold a master's degree in one of the natural sciences, engineering, or mathematics or have equivalent experience.
2. Have an appropriate background in aspects of the geosciences relevant to the intended field of study.
3. Provide the names of at least three (3) people who can submit letters of recommendation speaking to your research skills and ability to succeed in a PhD program.
4. Provide a reason statement.

Exceptional students without a M.S. degree may be considered for admission. A student who holds a master's degree from UWM must formally reapply for admission to the Graduate School before continuing studies toward the Ph.D.

Credits and Courses

Code	Title	Credits
	Credits taken from formal master's study	24
	At least 18 formal graduate credits beyond the master's degree	18
	Elective and GEO SCI 998 Doctoral Dissertation credits	12
Total Credits		54

Doctoral students must earn 54 credits beyond the bachelor's degree, of which 24 credits may be taken from formal coursework completed as part

of the master's study. At least 18 graduate credits beyond the master's degree must be earned in formal coursework.

Each student must prepare a formal Program of Study to be submitted to the Geosciences Department within the first semester in the program. Courses are selected in consultation with the student's advisor and with approval from the Doctoral Committee. Students are strongly advised to take courses from each of their committee members prior to taking the doctoral preliminary examination. For full time students, coursework should be completed within 4 semesters after admission to the Ph.D. program. In unusual situations, this timetable may be extended beyond 4 semesters. A timetable for coursework completion for part time students will be established on an individual basis.

Additional Requirements

Residency Requirement

The Graduate School requires satisfaction of a residency requirement. This involves completing at least 8 graduate credits in 2 consecutive semesters or 6 graduate credits in 3 consecutive semesters (including summer sessions) while in full doctoral status at UWM. In addition, at least half of the graduate credits required for the Ph.D. must be earned at UWM.

Quantitative Skill

A working knowledge of computer programming, statistics, numerical methods, or GIS appropriate to the student's field of study is required. Standards for this requirement will be established by the student's Doctoral Committee. Undergraduate courses taken to meet this requirement do not apply to the course requirements for the Ph.D.

Doctoral Committee

The membership of the Doctoral Committee will be established in the student's first semester. The Committee must consist of the following: the doctoral student's advisor as chair (or co-advisors as co-chairs) and least three additional graduate faculty, one of whom may be external to UWM. The student is required to arrange a meeting with the Doctoral Committee at least once each year.

The student may request a change of advisor if another faculty member is available, willing, and able to assume that role. If this change involves a significant modification of the area of specialization or research, the student's record will be reexamined to determine whether the student's background is sufficient for the new specialty. If it is not, it may be necessary for the student to withdraw from the program and reapply in the new specialty. Normally such a change of direction will not be allowed once the dissertation proposal has been defended.

Doctoral Preliminary Examination

Advancement to dissertator status requires that students 1) submit and successfully defend a dissertation proposal and 2) pass a doctoral preliminary examination. The doctoral preliminary examination consists of a set of written exams from the Doctoral Committee and a follow-up oral examination. The structure of the written examination will be established by the student's Doctoral Committee, and the student must demonstrate knowledge in the fields of geology and related sciences as defined by the Doctoral Committee. As part of the oral examination, the student must successfully defend their dissertation proposal, which must be approved by the doctoral committee. The dissertation proposal should be in an NSF-style format and should provide an overview of and approach to the problem being addressed, a budget, and appropriate bibliographic references. For full-time students, these examinations must

be passed prior to the start of the 5th semester and after the residency requirement is fulfilled.

Annual Presentation of Results

All students beyond their first year of study are required to present a public progress report annually to the Department.

Dissertation

The candidate must present a written dissertation reporting the results of independent, original research carried out under the direction of the major professor. Prior to a defense, the dissertation must be reviewed by the entire Doctoral Committee.

Dissertation Defense

The student first will give a presentation of their research results in a public forum. The dissertation must then be orally defended in a closed session before the entire Doctoral Committee. The defense may include questions related to any of the dissertator's fields of study. If the dissertation is defended and the oral examination is passed to the satisfaction of a majority of the Doctoral Committee, the candidate is passed and recommended for the degree.

Time Limit

All degree requirements must be completed within ten years from the date of initial enrollment in the doctoral program.

Additional Requirements and Information

Detailed information about program requirements is provided to each student following admission and is available from the Department office. For additional information on Graduate School Ph.D. requirements, see the Doctoral Requirements (<http://uwm.edu/graduateschool/doctoral-requirements/>) Webpage.

Geosciences PhD Learning Outcomes

Students graduating from the Geosciences PhD program will be able to:

- formulate and conduct original research driven by hypotheses that expand the current boundaries of geologic knowledge.
- attain rigorous knowledge of earth materials, geological processes, and the selected discipline that is related to dissertation research.
- exhibit a mastery of quantitative (e.g., mathematical and statistical) skills to perform independent research.
- communicate effectively through writing and presentations to both professional audiences and the general public.
- apply critical thinking to solve geological problems.
- practice ethical and professional conduct.