

C. Preliminary Written Examination (revised in full, Fall, 2019)

A written preliminary examination is administered by the Department of Earth and Environmental Sciences to students pursuing a Ph.D. in the department. This examination requires each student to demonstrate basic knowledge in their chosen field of expertise as well as knowledge of the broader context in which they will define their specific research project. The philosophy of the written exam is two-fold: (1) to make sure that doctoral students getting a Ph.D. have an awareness of the disciplinary and/or interdisciplinary context of their research in the Earth sciences, and (2) to provide an opportunity early in the Ph.D. program for students to interact with faculty members who are central to their field of expertise and with members who are somewhat removed from that field but may provide useful advice on the scientific context in which the specific research will be conducted. In order to adhere to this philosophy, the written exam committee consists of two members who are close to the student's research field and two members who provide broader context within Earth sciences relative to the student's specific areas of interest. The choice of the two "context members" should be made to benefit the student's learning, whether it is to rectify some perceived deficiencies or complement knowledge around the specific field of research. The written examination is also an opportunity for the student to compose a high-quality, long format document, and as such constitutes an important stage in developing doctoral-level writing skills. The procedure and scope of the exam is similar for all students, but the assignment and final paper are distinct for each student in accord with their research interests and background.

The written preliminary examination should **NOT** explain in detail the methods, preliminary data, and/or expected outcome of the student's doctoral research. These aspects of the research will be included in the written document and formal presentation that are part of the oral preliminary examination. See the Department Student Personnel Coordinator (Jen Petrie as of 09/2019) to view examples of successful written exam documents.

TIMING

Ph.D. students entering the program in the Fall semester and already in possession of an M.S. degree must complete the written preliminary examination during the Spring semester of their first year of doctoral studies. By November 30 of their first year, students submit the names of four written preliminary exam committee members to the DGS for approval, via email.

Ph.D. students entering the program in the Fall semester without a prior M.S. degree must complete the written preliminary examination in the Fall semester of the second year of doctoral studies. By March 31 of their first year, students submit the names of four faculty examiners to the DGS for approval, via email.

The expected written preliminary exam schedule for Ph.D. students entering the program in the Spring semester is pushed back by one semester relative to the times above.

Any request to deviate from the above timelines must be presented in the form of a petition explaining the requested delay to be emailed to the Director of Graduate Studies and the Department Student Personnel Coordinator no later than the end of the semester prior to that in which the written exam would be taken following the expected schedule. The petition must be approved by the DGS and the written preliminary exam committee. Significant delays in this schedule will not be accommodated except in extenuating circumstances.

THE COMMITTEE

The examining committee consists of four faculty members from the Graduate Faculty of the Department of Earth and Environmental Sciences (UM, Twin Cities) or the Earth and Environmental Sciences Department (UM, Duluth). At least one member must be a Senior Member of the Graduate Faculty. (Note that all tenure track and tenured faculty in the Department of Earth and Environmental Sciences (UM, Twin Cities) are Senior Members.) Two of the four faculty examiners will serve as examiners in the primary subdiscipline (or track); generally the advisor or advisor(s) will serve in this capacity, although students with co-advisors can choose to have only one advisor on the written preliminary exam committee. The other two faculty members will serve as examiners in **two**

different areas of the Earth and environmental sciences considered to be outside of the candidate's Ph.D. research area. An official co-advisor who is not a member of the Graduate Faculty of the Department of Earth and Environmental Sciences is eligible to be a committee member. One committee member from outside the Graduate Faculty of the Department of Earth and Environmental Sciences (in addition to an official co-advisor who is not a member of the Graduate Faculty) is permissible, with approval from the DGS (see below), if the expertise of that faculty member is deemed necessary for examining the breadth of the student's knowledge and preparation around the research topic.

The student (with input and approval from the advisor or advisors) is responsible for assembling the committee and requesting approval of the proposed committee by the Director of Graduate Studies. It is recommended that the student meet in person with potential committee members to discuss the general research plans and the role that the faculty member would fulfill on the committee (i.e., primary sub-discipline or one of the two "context" areas). The request for approval of the committee should be emailed to the DGS. The request should include an explanation of the role that each committee member will play as per the description of the committee above. If the plan for the committee includes a faculty member from outside the Graduate Faculty of the Department, the request submitted to the DGS should justify the inclusion of the committee member in relation to the student's planned research area and the availability of relevant expertise within the Graduate Faculty. The Department Student Personnel Coordinator should be copied on all email correspondence with the DGS about the committee composition.

The committee will also include one ex officio member from the Graduate Studies Committee. Each semester, two of the faculty members of the Graduate Studies Committee will be assigned to serve as ex officio committee members for that semester. The names of the ex officio members for each semester will be provided to graduate students at the start of each semester. The role of the ex officio member is to ensure that the initial meeting of the committee, at which the assignment for the written preliminary exam is developed, and the assignment itself both conform to the procedures outlined here. The ex officio member is not to participate in the discussion of the research area and the assignment, unless that discussion deviates from the procedures outlined here. In the event that the final evaluation of the written exam is pass, the ex officio member will have no other role in the written preliminary exam. If the final evaluation is pass with reservations or fail, the ex officio member is expected to read the exam, meet with the committee to discuss the evaluation, and participate in all discussions with the student regarding the evaluation and subsequent steps to ensure that the evaluation is justified, the process is fair, and resolution of the evaluation is reasonable. If necessary, the DGS and, ultimately, the Chair of the department can also be consulted to ensure these outcomes.

It is the student's responsibility to arrange the initial committee meeting once the DGS has approved the committee, including arranging for one of the two faculty members of the Graduate Studies Committee serving as ex officio members that semester can attend the initial meeting.

THE MEETING AND THE ASSIGNMENT

Students must meet with their committee (including the ex officio member) at least **seven weeks** before the planned submission date of the written exam paper, and no later than the end of the first week in October for Fall semester exams and the end of the last week of February for Spring semester exams. These deadlines are so that the assignment can be given and the paper written by the student and evaluated by the committee before the last day of instruction each semester.

At the start of the initial meeting, the ex officio member of the committee will read aloud the procedures for the initial meeting, reminding all present of the following points: that

- The student will begin with a brief discussion or presentation of the general field of interest and the research plan as it stands at that time.
- The committee should only ask questions that clarify the research area and plan and that do not test the student's knowledge, which is not the goal of the meeting itself.
- The assignment should consist of three or four (and no more than four) general topics or questions that the student will address in the written preliminary exam to demonstrate breadth of knowledge in the core area(s) of the

research (one or two questions or topics) and key context area(s) related to the topic (one or two questions or topics).

- As soon as possible after the meeting, the student will submit by email to the committee a written summary of the assignment as understood by the student. The committee will respond with either approval or with revisions to the assignment with sufficient time for the student to make revisions and email the revised version to the committee again for approval. Once the committee approves the summary as reflecting the assignment as understood by the committee, the student will submit the assignment to the DGS and the Department Student Personnel Coordinator for the student's file. Final approval of the assignment by the committee and filing of the assignment with the department by the student will take **no more than seven days after the initial committee meeting**.
- The paper text should be 4,000-5,000 words long, excluding all other components, should be in a standard font and font size for readability, should include comprehensive in-text citations and a complete list of references cited in the text, and should include any figures (with captions), tables, or other additional components useful or necessary to complete the exam. A paper that is too short or too long relative to the assigned length can be grounds for a vote by the committee of pass with reservations or fail.
- The paper is due to the committee six weeks from the date the assignment was submitted to the DGS, which is itself to be no more than one week from the date of the initial committee meeting.
- The possible outcomes of the exam are pass, pass with reservations, and fail, the meanings and results of which are explained in the Graduate Handbook.

The role of the ex officio member in the initial meeting is to ensure that the procedures are followed and to intervene if the meeting deviates from these procedures. If necessary, intervention by the ex officio member will involve advising how the meeting needs to change to be consistent with the procedures. If the meeting follows the procedures, the ex officio has no other role in the meeting.

At the initial committee meeting, the student should briefly and informally explain the general field of interest and the research plan for the Ph.D. as it stands at that time. This can be a short presentation with slides, a talk at the white board, or an informal conversation, and should only take 10-15 minutes. This initial discussion should be detailed enough so that the committee can assess what topics in the core sub-discipline are relevant and what context areas are important for the student's training, but this should not be a formal thesis proposal, as that is the purpose of the written document submitted in advance of the oral preliminary exam.

From this initial presentation of the research area and the ensuing discussion during the meeting, the committee will devise three or four (and no more than four) general topics or questions that the student will address in the written preliminary exam. These topics will involve the background of the student's primary field of research and other fields of Earth Sciences that relate directly or indirectly to the primary field. The goals in designing the topics or questions are 1) to lead the student to write a paper that will allow the committee to assess the breadth and (to some extent) depth of the student's knowledge in the relevant primary field of research and also the broader contexts of Earth and environmental sciences for the primary field, and 2) allow the student to write a coherent paper even if it covers disparate topics. The meeting should not be used for questioning the student on specific knowledge; questions and discussion are supposed to help the committee and the student determine the best content for the written exam. During the initial committee meeting, the student should take notes regarding the topics or questions to be addressed in the written preliminary exam, and by the close of the meeting, all involved should be in agreement regarding the specific assignment for the written exam.

Within seven days after the initial committee meeting, 1) the student should email a short summary or outline (no longer than one page) of the meeting and the assignment for the exam for review, modification, and approval by the committee members; 2) the committee should approve the summary of the meeting and assignment, and 3) the student should email the approved version of the assignment to the DGS and the Department Student Personnel Coordinator for the student's file. Final approval may require revisions by the student, but approval should take no more than one week from the initial committee meeting. The onus is on both the student and the committee to complete this process within one week of the initial meeting. The student should communicate with the DGS if the assignment is not approved by the committee within one week of the initial meeting. The approved summary of the

meeting and the assignment constitutes a “contract” between the student and committee defining the topics or questions that should be covered in the written exam document. The approved summary should be emailed to the DGS and to the Department Student Personnel Coordinator, who will include the assignment in the student’s file and in a compilation of written preliminary exam assignments.

THE DOCUMENT

The final written document should be a coherent paper rather than a collection of isolated sections of text that address various aspects of the assigned topics or questions independently of each other. The topics discussed should be used to place the student’s research in a disciplinary and interdisciplinary context.

The text of the paper, exclusive of any other components (i.e., abstract, if included; bibliography; figure captions; tables; etc.), should be 4,000-5,000 words in length (i.e., ca. 16-20 double spaced pages). The page count for the text should be included on the title page or first page of the document. For readability, the text should be in a standard font and font size, and lines should be double-spaced. In addition to the text, the document should have a complete list of references cited (in a format that includes full titles of articles, book chapters, journals, and books) and may include figures (with informative captions) and/or tables. Supplementary material can be in any format, including multimedia.

The submitted work must be an original document created by the student without substantive assistance from others. Input from the advisor and committee members should be limited but may involve guiding the direction of the topics to be addressed and answering general questions. Students cannot submit preliminary drafts to committee members prior to the final submission and should not reuse parts or all of papers submitted previously for class assignments or any other purpose. Students can use resources available at the Center for Writing and can enlist peers to comment on clarity, but all content should be exclusively the work of the student.

SUBMISSION TO COMMITTEE

Students must submit the completed written examination to the committee no later than 4:30 p.m. on the day that is six weeks after the approved written assignment for the exam is submitted to the DGS and the Department Student Personnel Coordinator. The completed exam can be submitted earlier than that date, but cannot be submitted late, barring unusual and extenuating circumstances at the approval of the committee and the DGS. The student submits the final document to each committee member as a file (either docx or pdf) attached to an email and is also to email the file to the Department Student Personnel Coordinator for inclusion in the student’s file.

EVALUATION

The committee should render a consensus evaluation of the written examination within two weeks of its receipt. Discussions by the committee can be by email as a group, but a meeting of the committee (without the student) to discuss in person is preferred and recommended. Committee members will evaluate the degree to which the student demonstrates breadth of knowledge of the subjects addressed in the examination and will assess the paper based on the completeness and accuracy of the treatment of the topics or questions assigned, the degree to which the use of the literature is up to date and comprehensive for each topic or question, and the quality and suitability of the writing. It is the responsibility of the advisor to arrange the review meeting of the committee (or initiate an email discussion by the committee). If the committee consists of faculty at both the Twin Cities and Duluth campuses, the meeting may take place via conference call or teleconference at the discretion of the committee members. Each committee member should mark up the submitted document with comments and a summary for the student and pass those comments on to the student directly or via the advisor, who will pass on the editorial and summary comments of each committee member to the student.

The committee can return consensus evaluations of pass, pass with reservations, or fail. The advisor or committee can communicate the results of the examination in person to the student, but the result also must be emailed to the student, the DGS, and the Department Student Personnel Coordinator for inclusion in the student’s file and filing of the results with the Graduate School. The communicated result should include an explanation of the basis of the evaluation, and in the case of pass with reservations or fail, the explanation should be explicit and detailed in terms of the reasons for the evaluation.

If the committee determines that the student has passed the written examination, the student can begin to plan for the oral preliminary exam.

If the student has done an adequate job in some respects but needs to fix deficiencies in knowledge or other skills tested by the written preliminary examination, the result will be pass with reservations and the committee will additionally specify in writing in the communicated result what steps the student must take to remove the “reservations” so as to pass the exam. These steps may include, but are not limited to, taking one or more courses, doing assigned readings, and/or rewriting part(s) of the examination or adding to the examination. A specific time frame/deadline must be indicated in which these steps are to be completed. The steps necessary to remove the reservation and the time frame for completing those steps should be emailed to the student, the DGS, and the Department Student Personnel Coordinator for inclusion in the student’s file. With an exception for one or more assigned courses, all steps to remove the reservation should be completed within six weeks of the date that the student is informed of the outcome of the exam. Assigned courses necessarily cannot be completed until at least the following semester, and the reservation cannot be removed until the assigned courses are completed with a grade sufficient to earn credit towards the graduate degree plan (whether or not the course is included in the degree plan). A student cannot proceed to the oral preliminary exam until all reservations have been removed. The committee is responsible for assessing that the steps necessary to remove the reservations have been taken and that these steps are adequate for removing the reservation. The advisor should email the student, the DGS, and the Department Student Personnel Coordinator when the reservations are removed and the written preliminary exam is deemed passed so that the result can be included in the student’s file and filed with the Graduate School.

If the written examination does not adequately demonstrate that the student has sufficient knowledge and abilities to pursue a Ph.D. degree, the committee may decide on two options: (1) the student cannot pursue a Ph.D. degree; the option of switching to an M.S. program can be evaluated in discussion with the student, advisor, and the DGS, but switching to the M.S. program is not automatic and is not a necessary outcome of failing the written preliminary exam the first time; (2) the student may retake the exam once, in the semester that follows the first attempt. The decision as to which option will be pursued must also be included in the result of the written preliminary exam communicated to the student, the DGS, and the Department Student Personnel Coordinator. In the case of a second attempt at the written preliminary exam, the only possible outcomes are pass or fail with no option for pass with reservations. Should the outcome of the second written preliminary exam be fail, then the student cannot pursue a Ph.D. degree and the option of switching to an MS program can be evaluated in discussion with the student, advisor, and the DGS, but this is not automatic and is not a necessary outcome of failing the written preliminary exam a second time.