

## Solid Earth Geophysics Supplement to the UAF Department of Geosciences Comprehensive Exam Guidelines

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### How is this document used?

This document should be provided to (1) students who are intending to take the Solid Earth concentration of the MS or PhD in Geophysics and (2) committee members of these students. This document supplements the official university and department guidelines, which are linked below for completeness.

This document is available online at

[https://www.uaf.edu/geosciences/current-students/solid\\_earth\\_comps.pdf](https://www.uaf.edu/geosciences/current-students/solid_earth_comps.pdf)

The latest version of the document is stored as a google doc in the google drive of [uaf-geosciences@alaska.edu](mailto:uaf-geosciences@alaska.edu)

### UAF guidelines and Department of Geosciences guidelines

The UAF requirements for graduate degrees can be found here:

<http://catalog.uaf.edu/graduate/>

The comprehensive exam report is downloadable from the Graduate School:

<http://www.uaf.edu/gradsch/forms/>

The MS/PhD Geophysics curriculum is here:

<http://catalog.uaf.edu/graduate/graduate-degree-programs/geophysics/>

A comprehensive exam is required within the Department of Geosciences, which has established these guidelines for the MS and PhD exams:

[https://www.uaf.edu/geosciences/current-students/geosciences\\_comps\\_ms.pdf](https://www.uaf.edu/geosciences/current-students/geosciences_comps_ms.pdf)

[https://www.uaf.edu/geosciences/current-students/geosciences\\_comps\\_phd.pdf](https://www.uaf.edu/geosciences/current-students/geosciences_comps_phd.pdf)

Here we explain the comprehensive exam procedures for the **Solid Earth concentration** for the MS/PhD degree in Geophysics.

### MS Geophysics (Solid Earth concentration)

The comprehensive exam needs to be completed before the semester in which the student will graduate. In general, it should be taken as soon as possible once the most relevant coursework for the student's research topic is completed, and ideally before the end of their second year. MS students take an oral comprehensive exam.

A **thesis proposal** is required as part of the oral exam. The thesis proposal is due to the committee at least one week before the date of the oral exam; prior to this time the student should discuss and review the proposal with their advisor. The thesis proposal should be 10-15 pages of figures and single-spaced text, in addition to references. The proposal should provide a clear plan for *the entire thesis* that contains:

1. a title page that includes the (projected) thesis title, degree (e.g., PhD Geophysics), and committee members
2. For each research topic (or chapter or possible manuscript), include the following components:
  - a. a 4-8 sentence synopsis that presents the scientific question or hypothesis and the strategy to approach the problem [consider the outside examiner as your target audience]
  - b. an explanation of the scientific problem(s)
  - c. a review of relevant background literature
  - d. an explanation and documentation of methods to be used or data to be acquired
  - e. preliminary results
3. a plan and timeline for carrying out the research work needed to complete the thesis

The **oral exam** will begin with a presentation by the student, which should cover some or all of the material within the thesis proposal. The presentation should be about 30 minutes in length and address the categories listed for the thesis proposal. The committee will then ask the student questions about the thesis proposal and any relevant background material related to the student's research topic. The formal assessment of the oral exam—Pass, Conditional Pass, or Fail—will take into account both the thesis proposal and the oral exam. The total time of the oral exam is typically 2 hours.

### **PhD Geophysics (Solid Earth concentration)**

Students should try to complete their comprehensive exam after they have completed the coursework needed for their project, and ideally before the end of their second year in the program. PhD students must take both a written and an oral comprehensive exam. These two parts do not have to be done immediately after the other; the written exam may be taken a few weeks before the oral exam.

**The written exam will have three parts. Each part will be taken within a 3-hour time limit, with the entire exam to be taken within a single (M-F) week.** Each part will be either open-book or closed-book. The topics for the exam, typically three, will be as specified on the student's Graduate Study Plan. Written exams are graded pass/fail, although the student should expect some follow-up questions in the oral exam based on their answers to the written exam. Students can expect to receive feedback from their committee on the written exam performance before the oral exam.

A **thesis proposal** is required as part of the oral exam and is described in the MS requirements. The length should be 15-20 pages, in addition to references.

The **oral exam** will begin with a presentation by the student, which should cover some or all of the material within the thesis proposal. (Note: A formal external examiner is required, as per UAF guidelines.) The presentation should be 30-45 minutes and should address the categories listed in the thesis proposal. The committee will then ask the student questions about the thesis proposal and any relevant background material related to the student's general field of study. This questioning should include any areas of concern raised by the student's answers to the written exam. The formal assessment of the oral exam—Pass, Conditional Pass, or Fail—will take into account both the thesis proposal and the oral exam. The total time of the oral exam is typically 2-3 hours.

### **Recommendations for the (PhD) written exam for student and committee**

- The written exam should be based on the topics specified in the Graduate Study Plan. These topics are established at the first committee meeting at the end of the first year. The topics may need to be modified in subsequent years, and these modifications should be documented in the paperwork, after discussion between the student and committee. Ideally there should be three topics in the GSP.
- The comprehensive exam, including the written exam, may include any material that the student has been exposed to in courses, seminars, and their research.
- The committee should establish the examination questions at least 2 weeks prior to the examination date. This process should be organized by the Committee Chair, with clear instructions for each Committee member.
- All members of the committee should have an opportunity to review and discuss the questions.
- Each section of the exam should clearly indicate the instructions regarding the time limit, the availability of resources (e.g., Matlab allowed, books, internet, pdf files, etc) and the manner in which the exam is to be completed (e.g., hand-written, typed, access to printer, etc).
- It is the student's responsibility to have all materials that they wish to access be available at the time of the written exam.
- Following the exam, the Committee Chair should provide a complete scanned copy of the written exam (both the questions and the responses) to each Committee member.
- The student's written exam should be graded by the Committee before the oral exam and within 2 weeks after the exam is taken.
- An assessment of Pass, Conditional Pass, or Fail will be given for each section of the written exam.

- The overall assessment (Pass, Conditional Pass, Fail) of the written exam will be determined by the Committee. If the student is given a conditional pass on the written exam, the student must be given clear actions in the Comprehensive Exam Report.
- The student should meet with each examiner to review his/her exam, especially in the case of a Conditional Pass (or Fail) on a section of the exam. Such a meeting can also provide the student with guidance in preparing for the oral exam.

#### Recommendations for the oral exam for student

- The student is responsible for scheduling the oral exam with the Committee members and with the Graduate School.
- As stated in the department's guide to comprehensive exams (see above), the student is responsible for requesting an external examiner with the Graduate School.

**A student may wish to complete the PhD comprehensive exam within a short time period.**

**The table below provides an example of a condensed schedule.**

Mon (Week 1)	Tues (Week 1)	Wed (Week 1)	Thur (Week 1)	Fri (Week 1)
<b>Written Exam</b> Part 1	<b>Written Exam</b> Part 2	<b>Written Exam</b> Part 3	committee chair provides written exam responses to committee members  student submits (final) <b>thesis proposal</b> to committee members	
Mon (Week 2)	Tues (Week 2)	Wed (Week 2)	Thurs (Week 2)	Fri (Week 2)
[Mon–Thurs] committee reviews thesis proposal and written exam responses				<b>Oral Exam</b> (presentation and defense of thesis proposal)