



G E O L O G Y D E P A R T M E N T

Graduate Student Handbook

2021-22



Mt. Baker from High Pass

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CHAPTER 1

MS in two years – Table, timeline, and deadlines

Quarter	Year 1
Fall (Q1)	<ul style="list-style-type: none"> • Enter MS program (with few or no prerequisite courses) • Take 10 - 16 credits of courses pertinent to your MS program, including any prerequisite courses. This should include some subset of Geol 502 & Geol 503 credits related to reading or lab work relevant to your thesis. • Complete your Plan of Study in Degree Works • Finalize thesis topic with thesis advisor • Start writing grant proposals and begin your thesis proposal <p><u>Deadlines/Benchmarks:</u> Plan of Study due at the end of Fall Quarter</p>
Winter (Q2)	<ul style="list-style-type: none"> • Take 10 to 16 credits of courses pertinent to your MS program. This should include some subset of Geol 502 & Geol 503 credits related to reading or lab work relevant to your thesis. • Submit grant proposals to GSA, Sigma Xi, AAPG, or other agencies. • Assemble thesis committee and arrange your first meeting with them to explain your project (either informal or formal) • Finish the first draft of your thesis proposal, proofread and revise the proposal before giving it to your thesis committee chair for comments <p><u>Deadlines/Benchmarks:</u> GSA Deadline Typically 1st of February, 5:00 PM (MST); confirm on GSA web page</p>
Spring (Q3)	<ul style="list-style-type: none"> • Complete required 33 credits of course work and all prerequisite courses by the end of the quarter. (<u>One</u> course in year two could be taken if you are good at managing your time and unlikely to suffer writer's block.) • Revise thesis proposal per committee chair's comments and give to all committee members for comments. • Arrange a meeting with your committee and present a formal presentation of your thesis project if not done in Winter quarter. • Submit additional grant proposals. • If committee member's opinions differ, hold a committee meeting to work out areas of disagreement before rewriting • Rewrite/edit thesis proposal • When proposal is approved, submit Thesis Topic Approval esign form (https://esign.wvu.edu/forms/Grad_School/thesis_topic_approval_2.aspx) <p><u>Deadlines/Benchmarks:</u> Finalized thesis proposal must be approved on or before the end of spring quarter.</p>
Summer (Q4)	<ul style="list-style-type: none"> • Data collection in field or lab depending on nature of thesis research • Prepare samples for analysis in Fall • Field/Lab work should be done or nearly done by the end of summer • Submit GSA / AGU abstract with thesis chair input/approval

Quarter	Year 2
Fall (Q5)	<ul style="list-style-type: none"> • Register for Geol 690 thesis credits. Typically, you would take 4 credits of 690 Thesis per quarter to total 12 at the end of the year. • Complete field and lab work • Start writing your thesis • Arrange a meeting with your thesis committee (optional) • Take a course or courses only if you have little or no field and lab work to do this quarter or if the remaining course you need is offered only in fall • Prepare GSA/AGU presentation (if presenting) and attend Fall meeting
Winter (Q6)	<ul style="list-style-type: none"> • Register for Geol 690 thesis credits. Typically, you would take 4 credits of 690 Thesis per quarter to total 12 at the end of the year. • Complete writing thesis by mid quarter. • Arrange a meeting with your thesis committee (optional) • Edit and revise each chapter at least two days after writing it. • Give chapter by chapter or as complete draft to your thesis advisor • Discuss your advisor's comments with him or her, then revise thesis (taking comments into account). <p><u>Deadlines/Benchmarks:</u> **If you are planning to graduate in seven quarters, then you must file your application for MS Degree (eform) with Graduate School by winter finals week.</p>
Spring (Q7)	<ul style="list-style-type: none"> • Register for Geol 690 thesis credits. Typically, you would take 4 credits of 690 Thesis per quarter to total 12 at the end of the year. • Arrange a meeting with your thesis committee (optional) • Submit revised thesis to all committee members by the beginning of classes; allow at least two weeks for them to read it • Revise thesis to incorporate committee suggestions; if necessary hold a committee meeting first to discuss any divergent views • Have committee sign thesis as ready to defend. Table defense copies (2 - one copy can be a pdf) • Give your defense presentation • Submit your Masters Degree Application esign form to the Graduate School (https://esign.wvu.edu/forms/Grad_School/_masters_degree_app_3.aspx) <p><u>Deadlines/Benchmarks:</u></p> <ul style="list-style-type: none"> • Week 6: Table thesis and schedule defense (https://esign.wvu.edu/forms/Grad_School/_masters_oral_defense_sch_1.aspx) • Weeks 8 – 10: Defend Thesis • Week 10: File Degree Recommendation Thesis Option (eform) with grad school (https://esign.wvu.edu/forms/Grad_School/_degree_rec_thesis_1.aspx)

<p>Summer (Q8)</p>	<ul style="list-style-type: none"> • Revise defense copy, complete drafting, assemble final copy, take thesis to committee members for their signatures; • deliver signature pages to Graduate School for Dean's signature, turn in full copy on CEDAR • Be ready to make any changes required by the graduate school. • Order hard bound copy of thesis from Print & Copy Center. Provided a set of original signature pages; signed, for this copy that will go to the Library's Special Collections. <p><u>Deadlines/Benchmarks</u></p> <ul style="list-style-type: none"> • Week 4 - Submit completed, signed thesis to Graduate School Dean • Week 6- All K grades including 690 thesis Ks must be cleared (submit Faculty Recommendation esign form) • Week 9- Commencement (attendance not required)
	<p>Year 3 (If necessary)</p>
	<ul style="list-style-type: none"> • If not currently registered for any credits, register for GRAD 699 Continuous Enrollment for one credit (\$50 plus fees, no other tuition), as required by the Graduate School every quarter (excluding summers) until all degree requirements are completed. {Please note: you must be registered for 2 credits of Geol 690 Thesis to be eligible to work as a TA or RA}

COMPLETING YOUR THESIS IN A TIMELY FASHION

The Geology faculty is committed to helping you graduate in two years. This implies cooperation between faculty and students to ensure speedy and efficient progress on the course of study and the thesis. However, faculty accept that the time schedule for graduation is your choice (within the 5-year Graduate School limit; <https://gradschool.wvu.edu/policies>), unless you are working under a grant awarded to faculty with time constraints on the completion of the grant. If you choose to take longer than two years, this may be the result of taking additional classes, pursuing many lines of research, or having to work; any of these will require more time.

GOAL SETTING

You should be thinking about thesis topics soon after coming to Western. Opportunities for Sigma Xi, GSA, and AAPG funding require deciding on the thesis topic by January of your first year. Thus, you should work with faculty early to ensure that deadlines for grant proposals can be met.

Although you are encouraged to pursue any topic for which the department has equipment and expertise, experience shows that the better the match between the problem and your adviser's current research interests, the greater will be the benefit to you.

In defining the thesis topic, faculty can help in:

- *** Clearly defining the problem and the scope of the project at the beginning of the research. This is a particularly difficult task as theses tend to expand in scope as they develop and may become mini-Ph.D.'s.
- *** Defining and planning to obtain the funding needed to complete the objectives of your thesis.
- *** Defining the project that will address the problem. The project will normally require one summer of field work and one or two quarters of laboratory work and should be designed so that it can be finished a quarter and a half later.
- *** Developing an initial plan to carry out the project. This involves advising on organization of the work and discussing the format of the thesis.

You are encouraged to use the Geology 595 Geology lunch talk presentation to do background research into the thesis topic.

PROGRESS

Faculty play a significant role in the success of their students. By constantly reviewing progress and providing positive feedback and constructive criticism, faculty can help you to meet your goals. You will be encouraged to give poster sessions or talks at the local and regional professional meetings, which provide worthwhile occasions to clarify ideas and organize data. Faculty can organize "show and tell" sessions for groups with common interests. Ultimately, you decide your activities and timetable, and faculty respect those decisions.

THESIS WRITING

Theses can get out of hand! Every effort should be made to shorten the thesis, including efficient design of maps and figures, and serious thought should be given to presenting the thesis in "journal publication" format with appendices for large blocks of data or description of methods.

In agreeing to serve as committee chair, faculty take the responsibility to assist you in setting goals, provide guidance on techniques and methods, and analyze your work. Faculty also agree to be available on a regular basis. The writing of the thesis is time-consuming and often difficult. You are encouraged to begin writing from the beginning of the thesis-definition stage and continue writing through the field and laboratory phases of the work. The outline of the thesis should be developed early and revised frequently--with constant faculty review. You should discuss timetables with faculty prior to giving them something to read; then you can expect faculty to return material within two weeks of receiving it.

You should feel free to give chapters to other committee members at any stage of the thesis writing, but generally give them chapters relevant to their interests. Generally, you should not ask other committee members to read large sections of the thesis until the chair is satisfied that the initial revisions are satisfactory. However, in the quarter you expect to defend, the faculty are all prepared to help in whatever way they can. Allow two to three weeks for a committee member to read your thesis, and expect to revise and have it reread, perhaps more than once, before you are ready to defend.

THESIS DEFENSE

The committee does not sign the defense "table copy" until satisfied that the thesis is ready to present to the Graduate School. The defense copy should be an acceptable body of work and be complete, including legible and clear figures with complete captions and details such as a table of contents with page numbers. You are expected to schedule your defense when your committee members are available; the committee chair should always be present (unless away on sabbatical). The defense is a presentation to the community and may take place on any class day of the academic year, and during finals of Spring quarter only. As faculty are generally away in the field, summer defenses will be scheduled only in exceptional circumstances. Permission for a summer defense and its date must be approved by the end of Spring quarter by the thesis committee and the department chair.

GOOD LUCK!

Program Guidelines

1. Desk Space

- a. All first-year graduate students and all graduate teaching assistants will be assigned shared office space.
- b. All desks must be vacated by July 31st every year except for those with continuing assignments.

2. Use of Department Supplies and Equipment

The department does not fund student printing, copying, long distance telephone calls or faxes, postage, or general office supplies.

There are computers available for graduate student use in ES230 and ES214.

3. Geology 595

GEOL 595 is a 6-credit, two-course sequence (fall and winter) designed to provide the information and resources that will facilitate the development your MS research project and thesis proposal. In the fall, the course focuses on defining your research question, reviewing background literature, scientific writing, and the development of a research proposal for outside funding, specifically a GSA Graduate Student Research Grant. Winter quarter focuses on the completion of your GSA proposal, the development of your thesis proposal, and the preparation for a Geology Lunch talk presentation on your thesis topic that will occur spring quarter. Another objective of the course is to introduce you to local and regional geology and research. You are required to take at least five (5) days of field trips. There will be a mandatory two (2) day trip fall quarter. The remaining three (3) days may be obtained by attending field trips from at least two (2) different courses. You are also required to attend all scheduled Friday Geology Lunch talks (12-1 pm) and Tuesday research seminars (4 pm).

Registration for Courses

The Graduate Program Adviser will provide initial registration advice and guidance to new graduate students. Students must develop their Plan of Study during their first quarter of graduate work with their faculty advisor and have it approved (It can be updated in Degree Works if necessary). See Course Planning and Plan of Study Worksheets later in this chapter.

Graduate students register for classes using the Web for Student registration materials supplied by the Registrar. Registration for independent study requires use of the Graduate School Directed Independent Study Contract and Registration Authorization eform.

(https://esign.wvu.edu/forms/Grad_School/_dir_ind_study_and_contract_3.aspx)

Progress Toward Degree

Satisfactory progress is required. The program must be completed in five years, requires a "B" (3.0) GPA, and continuous enrollment. Courses to satisfy background requirements are to be first priorities. Students are encouraged to seek frequent evaluations from the Graduate Program Adviser or their Faculty Research Adviser.

Academic Load

For full-time graduate students the maximum academic load is 16 credits during a single academic quarter. The typical load is considerably less. The Graduate School defines full-time enrollment as 8 or more credits per quarter, but some forms of financial aid require 10 or more for the full-time student.

A full-time graduate assistantship requires 20 hours of service per week to the department or program and can limit the number of credits the assistant may take in one academic quarter. A full-time assistantship does not allow for additional salary or employment from the University.

Transfer, Extension, Correspondence, Workshops

Transfer of credits into a student's graduate program is limited to nine quarter credits. Such credits must meet the requirements of the student's program and be approved by the Graduate Program Adviser and the Graduate School. The courses can be taken before or after enrollment at WWU.

Grades and Grading

Students must maintain at least a 3.0 grade point average for their core courses (those listed on the Graduate Plan of Study) with no grades below C- and no more than 10 credits below B-. A grade of C+ or lower counts towards the 10-credit maximum, even if the course is repeated and an A or B is earned. Pass/Fail grades are not applicable toward a graduate degree; however, S/U grades are.

Graduate Plan of Study

The student and the Faculty Research Adviser develop a "Plan of Study" [in Degree Works](#). The Plan of Study will be reviewed and approved by the Graduate Program Advisor at the end of fall quarter.

The Graduate Plan of Study is very important, as it specifies minimum curricular requirements which must be met, and it serves as a means for the Graduate School to determine whether all these requirements will be satisfied. This Plan should be completed in Degree Works by the end of your first quarter.

Graduate students are free to enroll in courses not on their Plan of Study. The Plan of Study is simply the approved courses which must be completed in order to meet the M.S. course work requirements. Courses not on the Plan of Study may be audited or taken Pass-Fail, at the student's discretion, and they do not count in your grade point average.

Credits and Financial Aid

New Federal rules specify that you can receive financial aid for **no more than 56 credits** in the geology M.S. program (125% of the required 45 credits). Be sure to keep this limit in mind when planning your program with your thesis advisor.

M.S. IN GEOLOGY

Program Requirements

45 to 48 credits, including:

- at least one quarter of full enrollment (8-10 credits)
- 33 or more credits of courses at the 400- and 500- level, including 6 required credits of GEOL 595, with a maximum of 10 credits from 400- level courses.
- 12 -15 credits of Geology 690 (thesis)
(you may take more than 15 thesis credits, but only 12-15 credits will count towards the 45 required credit hours, and will be graded.)
- up to 9 transfer credits, by special prearrangement only

with no more than:

16 credits per quarter

10 credits of approved 400-level course work

10 credits of independent study (Geology 500)

Once your course work is completed, if you are not yet ready to table and defend your thesis, you must register for GRAD 699 Continuous Enrollment for one credit (\$50 plus fees, no other tuition), as required by the Graduate School every quarter (excluding summers) until all degree requirements are completed.

Requirements Specified at the Time of Admission

You should work to satisfy any such requirements for prerequisite courses as soon as possible.

Grade Requirements

You must maintain at least a 3.0 GPA for the courses on your Plan of Study. These courses may include no grades lower than C- and no more than 10 credits with grades below B-.

PLAN OF STUDY WORKSHEET

First Year

Fall Quarter

Geology 595 (3 credits)

Submit an official Plan of Study
Meet with faculty to develop thesis proposal.

Winter Quarter

Geology 595 (3 credits)

Complete draft of thesis proposal

Spring Quarter

Present thesis proposal and submit thesis proposal form for approval.

By the end of Spring quarter, you should have:

Completed Geology 595

Cleared all entrance requirements

Presented a thesis proposal and submitted a thesis proposal approval form

Summer Quarter

Thesis field/lab work

PLAN OF STUDY WORKSHEET

Second Year

Fall Quarter

Geology 690 (recommended 4 credits)

Most of your thesis lab work will be done this quarter.

Winter Quarter

Geology 690 (recommended 4 credits)

Complete the first draft of your thesis before the middle of the quarter. Turn draft in to your thesis advisor to approve your draft for distribution to other committee members by the end of Winter Quarter.

Spring Quarter

Geology 690 (recommended 4 credits)

Finish and defend your thesis!

Advancement to Candidacy

The next step after a student's Plan of Study has been approved and filed in the Graduate School office is Advancement to Candidacy. Advancement to degree candidacy is formal recognition that the student has completed all admission requirements, has demonstrated satisfactory performance in at least 12 credits of graduate study, and has submitted an approved thesis proposal. The student must have completed at least 12 credits from the Plan of Study with grades of B or better. If the student was initially admitted provisionally, advancement to candidacy cannot be made until this status is changed to full admission. No thesis course work (Geol 690) may be undertaken until the student is advanced to candidacy (turned in their approved thesis proposal and signed Thesis Topic Approval eform https://esign.wvu.edu/forms/Grad_School/_thesis_topic_approval_2.aspx). Advancement is granted by the Graduate School upon the recommendation of the Department Chair. Normally, a student should have been advanced to candidacy by the end of her or his third quarter at Western.

Application for Master's Degree

The Master's degree is earned at the end of the quarter in which the student completes all degree requirements, provided all Graduate School deadlines have been met. Application for the degree must be made according to the deadlines posted by the Graduate School:

<https://gradschool.wvu.edu/degree-completion>. Application is made using the "Application for Masters Degree" esign form

https://esign.wvu.edu/forms/Grad_School/_masters_degree_app_1.aspx. A diploma fee will be charged.

If you need to delay to another quarter, you can fill out the Masters Degree Application form again, with the new quarter listed and route for approvals. The fee will not be charged twice. The Graduate School can provide you with a letter of completion necessary for applying for employment when you have defended and turned in your thesis but have just not been awarded your degree.

Thesis Registration

Because Geology 690 is a variable credit course, the student must have an override code entered by both the Department of Geology and the Graduate School prior to registering. Contact both and have them enter the override code, then register. A total of 12 credits of Geology 690 is required; however, you may take more thesis credits, for example, to maintain full-time status. New Federal rules specify that you can receive financial aid for no more than 56 credits in the geology M.S. program (125% of the required 45 credits). Be sure to keep this limit in mind when planning your program with your thesis advisor.

A "K" (incomplete) grade is given for thesis credits (Geol 690) until the thesis is completed. Then the final grade is awarded and the "Ks" become the final grade, e.g. K becomes KA. This occurs when the thesis committee chair sends to the Graduate School the final grade for the thesis and information about the number of credits to be allowed on the Recommendation for Master's Degree form (see Appendix I). No more than 12 thesis credits will be converted from K to a letter grade. Any additional thesis credits will remain as K permanently.

The Graduate School will notify the Registrar of the final grade, and the change from "K" to the final grade will be made.

Continuous Enrollment Registration Requirements

If not currently registered for any credits, register for GRAD 699 Continuous Enrollment for one credit (\$50 fee, no other tuition), as required by the Graduate School every quarter (excluding summers) until all degree requirements are completed.

Graduation Checklist

1. Have I completed all prerequisite courses by the end of the 1st year?
2. Have I filed my Plan of Study by the end of the 1st Fall quarter?
<http://www.wvu.edu/gradschool/forms.shtml>
3. Have I turned in my thesis proposal and filed the thesis topic approval eform by the end of Spring quarter my 1st year? <http://www.wvu.edu/gradschool/forms.shtml>
4. Have I completed all the courses listed on my Plan of Study?
<http://www.wvu.edu/gradschool/forms.shtml>
5. Are all "K" (incomplete) and "X" (missing) grades taken care of?
NOTE: All "K" grades become "F" if not completed within one year.
6. Do I have the List of Important Dates from the Graduate School for the quarter I intend to graduate and have I applied for a degree?
<http://www.wvu.edu/gradschool/graduation.shtml>
7. Have I completed at least 12 credits of Geology 690?
8. Has my Application for Master's Degree eform been filed?
<http://www.wvu.edu/gradschool/forms.shtml>
9. Has my thesis been approved for defense and tabled?
<http://www.wvu.edu/gradschool/forms.shtml>
10. Have my defense been scheduled and the Oral Defense Schedule form submitted?
https://esign.wvu.edu/forms/Grad_School/_masters_oral_defense_sch_1.aspx
11. Has my thesis been defended?
12. Has the revised thesis been signed by my thesis committee and eform sent to my thesis advisor(s), my signed thesis signature pages delivered to the Graduate School, and my thesis turned in on CEDAR?
https://esign.wvu.edu/forms/Grad_School/_degree_rec_thesis_1.aspx

If all answers are YES, then I'm done. Huzzah!

CHAPTER 2:

YOUR THESIS FROM PROPOSAL TO PRINTING

Your Faculty Research Advisor (thesis committee chair)

The Thesis Committee

Thesis Proposals

Thesis Writing & Defense Signature Page

Approval for Defense Signature Sheet

The Thesis Defense

Journal Thesis Option

Thesis Manuscript Regulations

Thesis Copies & Submission via CEDAR

Thesis Collections

YOUR FACULTY RESEARCH ADVISOR (thesis committee chair)

Your thesis advisor is the single most important person in the faculty during your MS program; s/he will help guide you through your entire thesis program. Because this relationship is so crucial, the Geology Department requires that all incoming MS students have a thesis advisor when they are admitted to the program. In accepting you to their research program, your advisor has committed to being your primary academic mentor towards your goal of obtaining an MS degree. In certain (fairly rare) circumstances, however, a student may need or wish to change thesis advisors. Generally, this happens because either the faculty member is not able to continue advising the student, or some other incompatibility develops between student and advisor (such as a change in research interest by the student). In such a situation, the student should seek another member of the Geology faculty to act as their thesis advisor. In order to be approved, both the original advisor and the prospective advisor must agree to the change. Following the change, the student must proceed through the thesis checklist as originally outlined (from Topic Approval through the defense) in order to graduate.

The Thesis Committee

The student together with the Faculty Research Advisor selects the thesis committee, which must have at least three members. The Faculty Research Adviser, who must be from the Geology Department, chairs the committee. At least one additional committee member must hold a regular faculty appointment in the Geology Department. Other committee members may be appropriate faculty from other departments, research associates, or from outside the university.

The student submits the names of the committee members on the Thesis Approval eform (see Appendix I) together with the approved thesis proposal to the Department Chair for his or her signature. The proposal goes to the student's file, and the eform is sent to the Graduate School after departmental approvals.

The Graduate Dean formally appoints the committee. The student is officially notified of her or his committee membership by the Graduate School office. The committee's function is to advise on and consent to the thesis topic, to act as consultants during the course of the research and writing, to judge when the thesis is ready for defense, and to approve the final thesis before it is submitted to the Graduate School.

Normally, appointments to the thesis committee are permanent. However, circumstances may arise that make a change desirable. Any change in the membership of the thesis committee should be initiated by memo to the Graduate School by the Department Chair.

It is up to the student and the student's thesis committee to design the details of the actual thesis project. If difficulties arise, or if project modification is necessary, it is important to discuss the matter with all committee members, preferably as a group rather than individually.

Thesis Proposals

Consult your thesis advisor and other committee members about what format they think suits your topic. There is no set format for a proposal, but it will probably be easier in the long run to use the margins, heading style, and so forth that are required for the thesis. Then you'll be able to move parts of the proposal directly into your thesis. Use the model on the following page when you fashion the signature page for your proposal. The section of this Handbook on Thesis Manuscript Regulations covers requirements for the thesis itself.

How long should a thesis proposal be?

A proposal needs to be as long as necessary to state what needs saying, and not a word longer. Typically it will be about 15 pages of double-spaced text (12-point font Times Roman), but some faculty prefer a longer proposal with a full discussion of previous work. Keep in mind that a typical NSF proposal is 15 pages maximum, including figures, so you should be able to contain the thesis within somewhat less than that.

What things need to be covered in a thesis proposal?

Although different topics may need you to say different things, the sections listed below will be needed in nearly all proposals.

- An introduction to the particular problem that you will be trying to solve, including why the problem is worth solving.
- Enough background to assure two things:
 - that the problem is understandable to geologists outside the specialty, such as the second and third members of the thesis committee.
 - that you are familiar with the work that has already been done in the area, understand it, and know how your work fits into the pattern of what has already been done.
- A more detailed discussion of the problem, in particular stating hypotheses, which of them you plan to test, and how you envision testing them - how the research will be approached. You should specify what the possible outcomes of the tests will say about the hypotheses, which outcome would refute a hypothesis and which would support it.
- The importance of the proposed research as compared to alternative approaches (a justification).
- A description of the study area, and why that area was selected.
- A description of the methods you plan to use to collect data and why they are appropriate for your problem.
- A discussion of the anticipated (or potential) results and potential implications. Depending upon the nature of the project and the particular advisor, you may also need to describe the estimated time line for the project and give a budget.
- Plans for publication of the results.
- References.

How should I get started?

Try using the list of sections above as the basis for an outline. Share that outline with your advisor (and committee members). Ask your advisor if you may see a copy of a successful proposal by one of his or her students.

When is the first draft ready to show to my advisor?

The “first draft” that your advisor gets should not be the first one you write. Talk to your advisor about what and how you should write as you go along, but don't hand in a draft until you know it is well written. Your draft will help shape your advisor's view of your talent as a writer and as a geologist. So write a complete draft, let it sit for a couple of days, ask a friend to look it over, then review and rewrite. Correct typos. And be sure to run a spell check before turning it in!

Thesis Writing and Defense Signature Page

Writing a thesis teaches not just how to plan and carry out a research project and the scientific skills needed but also how to negotiate for approval and manage your time. When you write, follow the format explained in this handbook. The way to write is to write. Start as early as you have anything to say, and work closely with your thesis advisor. Talk to your committee members and get their advice about both science and its presentation. They may not all agree, and you need to get disagreements resolved early. A group meeting of you and your whole committee is a good way to work out problems. And keep on writing. It is usually easier to write about research methods, for example, as you are carrying them out.

It takes a great deal of time to write your thesis. As a rule of thumb you'll need to have your first complete draft to your committee prior to the quarter in which you plan to graduate and by the beginning of the quarter in which you plan to defend.

If a thesis committee member is expecting a draft of your thesis and gets it on schedule, normally you can expect to get the draft back with comments in two weeks or less. Normally excludes drafts that are delivered when the committee member is, will be, or just has been away from campus; or is completing a major project; or has informed the student that longer will be needed. Normally also excludes drafts that haven't been well organized and thoroughly edited and proofread by the author. Once you get a draft back, it is up to you to talk to your committee members and work out what changes are needed for them to give their approval.

Once you think you have a draft that your committee will approve as ready for defense, circulate it to the members with a special signature page attached. That page should give your name and thesis title, followed by the sentence:

We have read this thesis and approve it for defense.

Also include lines for the necessary signatures. (See the sample page that follows.) All committee members should sign the same Defense Signature Page (NOTE: if any of your committee members are off-campus, an email stating their approval that the thesis is ready to defend will suffice)

Graduating in a Timely Fashion, in the first chapter of this handbook, also has suggestions for writing your thesis.

*******MUST BE TURNED IN SIGNED WITH YOUR TABLE COPY OF YOUR
THESIS*******

Author
Thesis Title

We have read this thesis and approve it for defense:

Chair

The Thesis Defense

The Defense Copies of the Thesis (2 copies - one hard copy, one pdf)

The defense copies or "table copies" of your thesis should be an acceptable body of work and be complete, including legible and clear figures with complete captions, table of contents with page numbers, page numbers throughout, abstract, complete reference list, and all maps, appendices, and such that will be in the final thesis.

Your committee members do not sign the defense signature page until satisfied that the thesis is ready to submit to the Graduate School. The table copies need not be in the final printed form on bond paper. The page numbers may be written in by hand, and minor corrections may be made in ink; however, a non-geologist should be able to type the final copy from the "table copy" with no consultation.

Submit two (one hard, one pdf) copies to the Geology Department office and tell them the date you prefer to hold your defense. Clear the date and time with your committee members, who are all expected to attend. A room for your defense will be reserved at this time. One of your "table copies" will be available for comment in the department office and the other will be sent to the Graduate School for your Graduate Council representative. The eform (will be submitted to the Graduate School when the office schedules your defense for you.

Timing of the Thesis Defense

The date of your thesis defense will be at least two weeks after the defense copy of your thesis is ready, signed, and available in the Geology Department office. The Masters Oral Defense Schedule form https://esign.wvu.edu/forms/Grad_School/_masters_oral_defense_sch_1.aspx will be submitted for you once you have your thesis signed by your committee and ready to table

Thesis defenses may take place on any class day of the academic year and, for Spring quarter only, during finals week. Because faculty and the rest of the geological community are frequently away in the field, summer defenses will be scheduled only in exceptional circumstances. Permission for a summer defense and its date must be approved by the end of Spring quarter by the thesis committee and the department chair.

Your thesis committee members are expected to be present at your thesis defense. You are responsible for arranging with the members of your committee a defense date that will be convenient for them all. Exceptions are made only when a committee member is out of town for an extended period. If you are trying to arrange a defense date to suit your family or employers as well as your committee, ask everyone involved for their schedules early, well before you plan to schedule your defense.

Thesis defenses are usually held at 4:00 p.m. so that they do not conflict with classes.

Allow at least two weeks after your defense for making changes to address comments written on your defense copy and points raised at your thesis defense. More time may be needed, especially if the figures and tables in your defense copy are not in final form. Your advisor can help you estimate the time needed. Keep in mind that this rewriting may change your quarter of completion if the Graduate School deadlines cannot be met. See following section for requirements for the format of your thesis.

Required Thesis Pages:

The Graduate School requires certain pages in every thesis (<http://www.wvu.edu/gradschool/thesis-project.shtml>). You can find examples of most of these pages on their web page (http://www.wvu.edu/gradschool/pdfs/Sample_Pages.pdf). For more information or any questions about these pages, please contact the Graduate School.

WWU Journal Thesis Option

Journal Article Thesis

In the Journal Article Thesis, the candidate divides the thesis into two parts. **The first part is one or more articles prepared according to the style requirements of a national or international scholarly journal so that the article(s) is (are) suitable for publication.** The article(s) should avoid extreme brevity and be understandable to the members of the candidate's thesis committee even if this necessitates some elaboration of the standard article format. The second part of this thesis provides greater context and/or supporting information for the article(s).

Specific requirements are:

1. The student must use the publication style of either (1) one of the discipline's reading periodicals or (2) the published standards of the Geological Society of America Bulletin for the article(s). Two or more articles included in the same thesis may have different styles if written for different journals.
2. The **Abstract** is a summary of the entire thesis.
3. **In the Tabled version only**, the **Citation page** will give the literature citation for each **published article** included or specific information concerning **submission for publication** (i.e., name of journal and date of **acceptance for publication** or date of **submission to journal**). Do not include in the post-defense copy.
4. The main body of the thesis will include **one or more articles in approved journal or periodical style**. The following are also required, if not included (or deemed too brief by the thesis committee) in the journal article(s): (1) **a Comprehensive Introduction** and (2) **a Comprehensive Methodology** to precede the individual articles to provide an integrated perspective to the total body of research and literature, and to the details of the methods used.
5. All references for all parts of the thesis will be included in a **Comprehensive References Cited** section, including all references from the article or articles and all references from other sections, including **Comprehensive Introduction** and **Comprehensive Methodology** if those are used. No portions should have separate reference sections.
6. **Any article comprising a major portion of a thesis must be the work of the student.** The student must be the **sole author** or, if there is more than one author, the **primary and first listed author of articles prepared for publication**. In situations of more than one author, it is the responsibility of the thesis committee to determine that the research and writing is indeed that of the candidate for the degree.

7. The Journal Article Thesis contains appropriate appendices needed for detailed and ancillary information required for completeness and explanation but not usually presented in a published paper.
8. The manuscript(s) that forms the core of the journal-thesis option must be submitted to the journal publisher for scholarly review prior to submitting the thesis to the Graduate School; the manuscript need not be accepted, however. In addition, regardless of the publication status of the manuscript, the manuscript must be accepted by the thesis committee before submission to the Graduate School, and any comments or criticisms from the committee that are noted in the tabled copy and during the defense must be dealt with to the satisfaction of the thesis committee. Publication of a thesis manuscript is not sufficient in itself for the degree.

NOTE: THE COMPREHENSIVE BIBLIOGRAPHY MUST BE IN ALPHABETICAL ORDER BY LAST NAME OF AUTHOR.

Each article will contain its own Reference section in addition to the Comprehensive References Cited section.

The organization of a Journal Article Thesis/Dissertation is as follows:

- Committee Signature Page
- Authorization/Copyright Page(s)
- Title Page
- Abstract Page - for entire thesis (one only)
- Citation Page - special requirement - **table copy only**
- Acknowledgement Page (optional) include anyone who contributed to or who will be a co-author of the paper (or you may include this information as an Appendix)
- Table of Contents
- List of Tables
- List of Figures
- Comprehensive Introduction (if not included in journal article(s))
- Comprehensive Methodology (if not included in journal article(s))
- Article(s) - Format follows journals' specific requirements
- Comprehensive References - Alphabetical order by last name of author
- Appendixes (optional)
- Vita (optional)
- Pocket Material (optional)

In all provisions expect the Article(s) itself - which follows the format of a scholarly journal - the directives and requirements of the Graduate School and the Geology Department, as listed in the WWU Graduate Student Handbook, shall govern the preparation of a Journal Article Thesis.

MECHANICAL FORMAT FOR STANDARD AND JOURNAL ARTICLE THESES

The Standard Thesis and the Journal Article Thesis differ in organization and placement of material, but not in overall content, scholarship, or clarity or presentation. **Both plans have an identical title page, signature page, authorization page, abstract, table of contents, and mechanical format (margins, pagination, etc.).** See <http://www.wvu.edu/gradschool/thesis-project.shtml> for more information on required pages for the thesis

The candidate's graduate advisor supervises the preparation of the thesis. **Regardless of style and format, all theses must be prepared in accordance with accepted standards of academic integrity, including proper citation and attribution of all material that is not the original product of the writer.** When preparing theses, candidates are expected to consult their graduate advisor and thesis committee regarding specific thesis preparation problems. The thesis committee and Candidate is also responsible for consulting the Graduate School regarding University requirements and thesis deadlines.

EXAMPLE CITATION Page for JOURNAL Format

(Required for the table copy but not included in the defended and signed thesis)

This page **MUST BE APPROVED** by the Thesis Committee. *Use correct margins. Spell check.*

If one or more of these categories apply, complete the wording below. Follow a journal reference format you have adopted for your thesis or dissertation. See NOTE below.

Citation(s)

Material from this thesis has been published in the following form:

Swenson, R.M. (1999). The effect of eating New York Super Fudge Chunk on the productivity of graduate students. Journal of Ice Cream Eaters, 10, 235-255.

AND/OR

Material from this thesis has been accepted for publication in (name of journal) on (month, day, year) in the following form:

Swenson, R.M. (1999). The effect of eating New York Super Fudge Chunk on the productivity of graduate students. Journal of Ice Cream Eaters, 10, 235-255.

NOTE: *The manuscript must be submitted for publication ON OR BEFORE the day you submit your thesis to the Graduate School. Any article comprising a major portion of a thesis or dissertation must be the work of the student. The student must be the sole author or, if there is more than one author, the primary and first listed author or articles prepared for publication.*

Thesis Manuscript Regulations

The Graduate School has a set of very specific requirements for the Thesis manuscript:
<http://www.wvu.edu/gradschool/thesis-project.shtml>

Please read these thoroughly and follow them closely; the Graduate School reviews every thesis in detail and will reject any manuscript that does not adhere to these guidelines.

All thesis copies require completed signature pages with original signatures. Please refer to the Thesis Template and Sample Signature page links found here:
<http://www.wvu.edu/gradschool/thesis-project.shtml>

Thesis Copies

The Graduate School requires theses to be submitted via CEDAR (<http://www.wvu.edu/gradschool/thesis-project.shtml>). Two hard-bound copies with all photos and maps must be given to the University (one for the Geology Department, the other for Special Collections in Wilson Library).

The Chair of your thesis committee and the other committee members should be asked if they want copies or at minimum, a pdf. Generally they will. Order these copies with the others. These generally do not have to be hard-bound.

Don't forget to get a copy or two for yourself.

When you take your thesis to be bound, you will need to specify how the title will appear on the cover. For the cover, you are restricted to no more than four lines each of no more than 50 characters including spaces. There are no restrictions on the title for the title page.

Thesis Collections

Consult with your thesis committee at the time you are writing your thesis proposal to find out how extensive a collection of samples they expect you to leave with the department. Generally significant samples and those referred to specifically in the thesis are expected to be left with the department in support of your work. You are responsible for leaving your thesis specimens properly labeled and identified, according to the following standards.

- a. Each project is given an accession number and all specimens must have that number on them, eg. 224 printed on a white paint spot. There is no need to renumber rocks serially. The other numbers on the rocks will be those of the student's choice, eg. JC-434 for a serial method or JC-88-22 for an annual method.
- b. Save only those specimens referred to by number in your thesis. The minimum information on each specimen (best put in an Appendix, otherwise in the specimen catalog) is: (1) specimen number; (2) locality (give map coordinates or refer to a specimen locality map); (3) formation name; (4) page reference to thesis or description of rock and its occurrence.

TYPE	ELIGIBILITY (WHO CAN GET IT)	HOW NOMINATED	PROCEDURE (HOW AWARDED)	BENEFITS/AWARD AMOUNT	OTHER RESTRICTIONS AND COMMENTS
Teaching Assistantship, also called TA	<ol style="list-style-type: none"> 1. Full admit 2. 3.0 GPA if current student 3. FT enrolled (8 credit minimum) 4. Credit must be through WWU 	Department selects from among TA applications completed by students and forwards names to the Graduate Office.	<p>Graduate Office checks for eligibility requirements.</p> <p>Graduate Council approves.</p> <p>Graduate Office forwards department initiated PA to Student Accounts with a copy to the Student Employment Office.</p> <p>Graduate Office informs the student by letter.</p>	<ol style="list-style-type: none"> 1. Salary set by State and/or WWU for 2021-2022 is \$14,856 2. Student pays a portion of tuition upfront when registering, health fee and other misc. fees. 3. A partial tuition waiver is in effect for <u>all full-time assistants</u>. Out-of-State tuition is also partially waived for non-residents who are full-time assistants. 	<p>Students may not have other WWU employment.</p> <p>Student Accounts monitors credit load. If students drop below 8 credits or withdraw, they are ineligible for the waiver, which must then be repaid.</p> <p>If the student is a non-resident, only full appointment (not half) as a TA qualified him/her for partial reduction of the out-of-state tuition.</p> <p>Students are obliged to provide 20 hours per week of supervised service.</p>
<p>Note: If a department, grant, or faculty member employs a graduate student as a full-time Research or Lab Assistant, the appointment qualifies a non-resident student for in-state tuition and for the reduction in fees and deduction of operational fees from his/her TA salary. Such appointment must clear through the Graduate Office.</p>					
Research Assistantship, also called RA	<ol style="list-style-type: none"> 1. Full admit 2. 3.0 GPA if current student 3. FT enrolled (8 credit minimum) 4. Credit must be through WWU 	Faculty member with a grant selects the RA.	<p>Bureau for Faculty Research checks for eligibility requirements.</p> <p>BFR forwards department initiated PA.</p>	<ol style="list-style-type: none"> 1. Salary determined by grant budget. 2. Most grants pay tuition. 3. Some grants cover medical benefits. 	<p>Graduate Office monitors registration and cancels appointment if credits fall below eight.</p> <p>Students are obliged to provide 20 hours per week of supervised service.</p>
Reciprocity British Columbia, Canada	<p>Student must be a bona fide resident of B.C.</p> <p>Student must be full admit and should have demonstrated ability (normally one successful quarter).</p> <p>Student must be enrolled for 10 credits in regular WWU classes.</p>	Student completes reciprocity application form.	Graduate Office checks for eligibility. The total number of recipients is limited. Preference is given to BC students enrolled in graduate programs not available in B.C. Graduate Office notifies Registrar's Office of recipients, which in turn notifies Student Accounts.	<p>Student pays in-state fees for quarters he/she has been awarded reciprocity (award may be for one, two or three quarters).</p> <p>There is no guarantee of renewal for subsequent quarters.</p>	<p>Student may not hold a full-time TAship.</p> <p>Student Accounts monitors the number of credits registered for. If student falls below, student is billed by Student Accounts for the difference of in- and out-of-state tuition.</p>
Graduate Tuition Waiver Scholarship (State funding)	<ol style="list-style-type: none"> 1. U.S. citizen or Resident Alien 2. Full admit 3. Good academic standing 4. Enrolled for 10 credits 5. Clear financial need 	Department nominates and forwards names to Graduate Office with short statement describing student's needs.	Graduate Office checks for eligibility. Graduate Council recommends to the Graduate Dean. Graduate Office completes scholarship award form and forwards it to the Financial Aid office which notifies Student Accounts.	Student pays \$300 less at the time operation and tuition fees are due (\$300 for each quarter of the award).	<p>Student may <u>not</u> have either a full or half time TA appointment.</p> <p>Student accounts monitors student's credit load. If credit load is below 10, scholarship is canceled.</p>

APPENDIX 1:

SAFETY TRAINING

All graduate students must take the Geology Department's General Safety Training course annually. This training will be available via Canvas and is prerequisite to use any Geology Department resources. In addition to the General Safety Training course, graduate students who perform research in the laboratory must be trained the use of the specific chemicals they intend to use as part of their research (or as part of their RA). Training will include topics such as the proper use of personal protective equipment, hazard communication, basic lab safety, hazardous waste disposal, and other specific relevant topics

The University has a responsibility to provide safety training to new employees and students who will be working with chemicals and/or performing hazardous tasks. It is the responsibility of each faculty member to ensure that his or her employees and students receive the necessary training. Contact Ben Paulson (x3585) to consult about specific safety training that might be needed when using specialized equipment, hazardous chemicals, or specialized fieldwork (e.g. boat use).

Ben Paulson (Ben.Paulson@wwu.edu, ES 208, (360) 650-3585)

- Geology's Departmental Safety Coordinator
- contact person if you have building related concerns (e.g., no heat, no tap water, leaks, etc)
- contact person for office needs (e.g., broken chair, etc.)
- provides technical support and instruction for most pieces of equipment
- liaison with technicians in Scientific Technical Services
- loans equipment and supplies (when available) for graduate research
- assists in ordering supplies for graduate student research

APPENDIX 2:

FINANCIAL AID

The Geology Department normally offers financial support as TA's or RA's to first- and second-year graduate students.

Financial Aid Options: https://www.finaid.wvu.edu/client_services/pages/apply/gradstudents.php

HEALTH INSURANCE

Academic Health Plans

Teaching Assistants are eligible for health insurance, paid for by the Graduate School, for each quarter serving as a TA. Insurance is provided through [AHP Health Plans](#)

<https://gradschool.wvu.edu/health-insurance>

APPENDIX 3

RESEARCH GRANTS

Most forms for these grants are available online. Talk to your GEOL 595 professor or graduate adviser about additional opportunities and previous successful applications.

Deadlines:

- GSA – early February
- Mazamas – early February
- AAPG – mid-February
- AGU – various
- Sigma Xi – mid-March, mid-October
- NW Fund for the Environment – mid-February
- Evolving Earth – mid-March
- Geology Dept. Advance for Research – April 15
- Ross Travel Grant – March 15, May 15, October 15, December 15
- David A. Rahm – mid-February

Outside Sources:

GSA Research Grants - <http://www.geosociety.org/grants/>
Graduate Student Research Grants - <http://www.geosociety.org/grants/gradgrants.htm>
Travel Grant - <http://www.geosociety.org/grants/travel.htm>
example of successful gsa grant application (**attach pdf link**)
American Association of Petroleum Geologists (AAPG) -
<http://foundation.aapg.org/students/graduate/giaprogram.cfm>
AAPG Student Page - <http://students.aapg.org/>
AAPG Foundation Grants-in-Aid - http://aapg.gia.confex.com/aapg_gia/2014/cfp.cgi
American Geophysical Union (AGU) - <http://education.agu.org/grants/>
Student Travel Grants (Aug. deadline)- <http://education.agu.org/grants/student-travel-grants-application-requirements/>
Research Grants & Fellowships - <http://education.agu.org/grants/research-grants-fellowships/>
Scholarships - <http://education.agu.org/grants/scholarships/>
Sigma Xi - <http://www.sigmaksi.org/>
Grants-in-Aid of Research - <http://www.sigmaksi.org/programs/giar/index.shtml>
National Science Foundation (NSF) – <http://www.nsf.gov/>
Information for Graduate Students -
http://www.nsf.gov/funding/education.jsp?fund_type=2
Mazamas - <http://mazamas.org/>
Research Grants - <http://mazamas.org/index.php/resources/research-grants/>
Resource Assistance for Rural Environments - <http://csc.uoregon.edu/rare/>
Northwest Fund for the Environment - <http://www.nwfund.org/>
Application Process - <http://www.nwfund.org/application/>
Evolving Earth Foundation - <http://www.evolvingearth.org/>
Grants - <http://www.evolvingearth.org/evolvingearthgrants/grantsmain.htm> *

On-Campus Sources:

WWU, Geology Department

Full Scholarship list - <http://geology.wvu.edu/dept/students/funding.php>

Research Advancement forms -

http://geology.wvu.edu/dept/students/funding/research_advance.shtml

Ross Travel Grant - <http://www.wvu.edu/gradschool/ross-travel-grant.shtml>

Application -

https://esign.wvu.edu/admcs/process/forms/Grad_School/Ross.aspx

Endowment Scholarship -

Graduate School Fund - <http://www.wvu.edu/rsp/documents/grad.shtml>

Application PDF - <http://www.wvu.edu/rsp/pdf/grad.pdf>

David A Rahm scholarship - <http://geology.wvu.edu/dept/students/funding/rahm.shtml>

WWU, Office of Research and Sponsored Programs –

<http://www.wvu.edu/rsp/index.shtml>

Links of forms - <http://www.wvu.edu/rsp/documents/allforms.shtml>

Proposal Routing form- <https://esign.wvu.edu/admcs/process/forms/BFR/Proposal4.aspx>

Internal Funding forms - <http://www.wvu.edu/rsp/documents/frminternal.shtml>

Geology Department Advance for Research

The Department of Geology will generally draw on its donation fund held by the Western Foundation to grant small advances for research expenses to undergraduate and graduate students in the department. Funds are available for field and laboratory expenses, which may include costs of analyses performed at other institutions. The amount of the advances will vary and will not exceed \$800. All applicants are expected to apply for funds outside of the department. The effort you make to gather outside money will be a factor in our decisions to offer these grants. Please apply through the Scholarship process for summer awards. Applications are in Canvas on the scholarship page. For awards in other quarters, please ask the office for assistance in gaining access to the application in Canvas. These can be awarded in other quarters if needed. Interested applicants should submit the following:

A **research proposal** approximately 2 pages in length; or a proposal submitted for another grant to fund the same research, include a cover letter to the Chair outlining how you would use the Departmental Advance in your research.

A **statement of other support**, including awards received or pending, including copies of the proposals submitted;

A **budget of total proposed field and laboratory expenses**, and how much of the total is requested from the Geology Department;

A **unofficial transcript** for any classes not taken at WWU (for undergraduates only);

A **statement of support** from your faculty adviser.

Deadlines to apply will be announced with the annual scholarship process. Past recipients of Departmental Research Advances for Field Work may apply again, but preference will be given to first-time applicants. Recipients will receive a notification letter informing them of the award and outlining the reporting requirements of the Western Foundation; when that letter is signed and returned, an advance will be dispensed.