

Western Washington University

Department of Geology

Graduate Student Handbook

2002 - 2003

Table of Contents

Emergencies	Inside Back Cover
Chapter 1	
Sequence of Procedures for the Master's Student.....	2-3
Geology Graduate Program Timetables.....	4
Completing your Thesis in a Timely Fashion	5-6
Program Guidelines	7
Desk Space.....	7
Miscellaneous.....	7
Geology 595 Brown Bag Presentation	7
Registration for Courses.....	7
Progress toward the Degree.....	8
Grades and Grading	8
Graduate Plan of Study	8-9
Independent Study Contract	10-12
Course Planning and Requirements.....	13
Suggested Course work.....	14
Plan of Course work Worksheets	15-16
Advancement to Candidacy.....	17
Graduation Checklist	18
Chapter 2 - Your Thesis from Proposal to Printing	
MS in Two Years Deadlines	20
Deadlines.....	22
Selecting an Advisor	23
The Thesis Committee	24
Thesis Proposals	25
Proposal Cover Sheet Example	26
Thesis Writing	27
Approval for Defense Signature Sheet	28
The Thesis Defense.....	29
Thesis Title Sheets	
Committee Signature Page.....	30
Authorization/Copyright Page	31
Title Page	32
Thesis Manuscript Regulations	33-34
Thesis Manuscript Suggestions	35-36
Thesis Copy/Duplication Guidelines	37-38
Thesis Copies.....	39
Thesis Collections.....	40

Appendix 1 - WWU Forms

Sequence of Procedures for the Master's Student.....	43-44
Directed Independent Study Registration Permit.....	45
Variable Credit Course Registration Permit.....	45
Request for Exemption/Transfer Credit.....	46
Graduate Plan of Study.....	47
Thesis Approval Card.....	48
Application for Master's Degree (blue card).....	48
Master's Orals Form (for thesis defense).....	49
Recommendation for Master's Degree (white card).....	50
Name Change Card.....	51

Appendix 2 - Financial Aid

Financial Aid Options.....	58
Application for Waiver for Non-resident Tuition and Fees for B.C. Residents.....	54
Application for Graduate School Assistantship.....	55-57
Graduate Minority Fellowships.....	58

Appendix 3 - Research Grants and Advances for Field Work

Scholarships & Awards.....	60-61
Funds for the Enhancement of Graduate Research.....	62-63
Graduate Student's Travel to Conferences.....	64-65
Sigma Xi Grants-in-Aid of Research Application.....	66-72
AAPG Grants-in-Aid Application.....	73-78
Geological Society of America Research Grant Application.....	79-92
GSA Research Committee Evaluation Checklist.....	93
Example of a Successful GSA Research Grant Application.....	94-98
Department of Geology Advance for Field Work.....	99
Mazama Research Grants Announcement.....	100-101
Northwest Fund for the Environment Announcement.....	102-106

Appendix 4 - Abstracts

GSA Instructions for Abstracts.....	108-110
GSA Abstract Submittal Form.....	111-112
"What Happened to My Abstract?".....	113
AGU Abstract Instructions.....	114
Geological Association of Canada Judge's Report for Poster Sessions.....	115

Appendix 5 - Preparing Slides for Talks

Effective Slides.....	117
Additional Tips.....	118
Consider Powerpoint.....	119

CHAPTER 1:

Sequence of Procedures for the Master's Student

Geology Graduate Program Guidelines - Thesis Option

Suggested Time Table

Geology 595

Desk Space

Miscellaneous

Completing Your Thesis in a Timely Fashion for Thesis-option Students

Registration for Courses

Progress toward the Degree

Grades and Grading

Graduate Plan of Study

Independent Study Contracts

Course Planning and Requirements

M.S. Plan of Coursework Worksheet

Advancement to Candidacy

Thesis Registration

Application for Masters Degree

Graduation Checklist

Geology Graduate Program Timetables

This timetable is designed to show you the steps needed to graduate in two years. (Also see "Graduating in a Timely Fashion".)

1. **Prerequisite courses:** Plan your schedule to complete any prerequisite courses listed on your letter of acceptance as soon as possible.
2. **Geology 595:** Must be taken in each of your first three quarters.
3. **Plan of Study:** The official form should be submitted by the beginning of your third quarter at the latest.
4. **Thesis proposal:** Begin work to select an advisor and a thesis topic immediately. (You may need to apply for research grants during January.) A good draft of your proposal should be presented to your thesis advisor early in your third quarter (Spring, for most of you). Work to assemble your thesis committee, have the proposal approved, and file your thesis-topic approval card by the end of that quarter.
5. **Advance to Candidacy:** File your Approval of Thesis Project form with the Graduate School. These are needed before you are allowed to register for thesis credits.
6. **Field and lab work:** Field work should be done and lab work well underway by the end of your first summer. Finish lab work by the end of Fall quarter.
7. **Writing:** Begin while in the field and continue as you carry out lab work.
8. **Completed thesis draft:** Give it to the Chair of your thesis committee by the middle of Winter quarter of your second year.
9. **Blue card:** File your Application for Master's Degree card by the last week of the quarter before you plan to graduate. You must register for at least two credits during the quarter you graduate or the preceding quarter.
10. **Defense draft:** You should have your thesis revised and approved for defense by mid-April of your second year for Spring graduation or by mid-May for Summer graduation.
11. **Thesis defense:** Schedule it during the first week of May or earlier for Spring graduation, by the end of Spring classes for Summer graduation. (Your defense must be at least two weeks after your thesis is approved and "tabled".)
12. **Thesis copy to Graduate School:** The final, defended, revised, signed thesis will be due to the Graduate School for the Dean's approval by about May 15 for Spring graduation and late July for Summer graduation. Dates vary from year to year.

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), unless you are working under a grant made to faculty with time constraints on the completion of the grant. If you choose to take longer than two years, this is not seen as failure to meet an implied standard. You may want to take additional classes, pursue many lines of research, or have 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 general 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 is equipped and has the 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:

- *** Defining the problem and setting limits at the beginning of the research. This is a particularly difficult task as theses tend to expand in scope as they develop and easily become mini-Ph.D.s.
- *** Defining the project that will address the problem. The project will normally require one summer of field work and one quarter 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 Brown Bag presentation to do background research into the thesis topic (but should feel free to pursue other interests if you wish).

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 Northwest Mining Association conference, the annual Tectonics Workshop, and G.S.A. and A.G.U. meetings, all of 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 time table, 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 time tables 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 will be assigned shared office space.
- b. Second-year graduate students who have filed a thesis proposal will be assigned shared office space.
- c. Third-year graduate students may be assigned office space if space is available, they are enrolled for 2 or more credits, and if, in the opinion of their thesis advisor and the chair, they are making substantial progress toward the thesis.
- d. Space will not be provided beyond the third year.

2. **Use of Department Supplies and Equipment**

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

There are computers available for graduate student use in ES230. Our computers use the DOS operating system.

3. **Geology 595**

Geology 595 is designed to introduce graduate students to the geology of the region, to the work the faculty are doing and to help students finish their thesis in a timely manner. There will be weekend field trips during fall and spring, of which you are required to take at least seven (7) days. There will also be workshops on writing grant and thesis proposals. During spring quarter of your first year or fall quarter of your second year, you will make a presentation on your thesis topic. For all three quarters, you are expected to attend guest lectures and the Friday noon Brown-Bag talks.

Registration for Courses

The chair of the Geology Department serves as the Graduate Program Adviser, providing initial registration advice and guidance to new graduate students. Students should begin to develop their Plan of Study during their first quarter of graduate work and have it approved early in the second or third quarter. See Course Planning and Planning Worksheets later in this chapter.

Graduate students register for classes using Touchtone registration materials supplied by the Registrar. Registration for independent study requires use of the "Directed Independent Study" course card (see Appendix I) and an Independent Study Contract. This card also requires a signature from the Graduate School. The Graduate School requires a copy of the Independent Study Contract.

Progress Toward Degree

Satisfactory progress is required. The program must be completed in five years, requires a "B" (3.0) GPA, and regular (if not 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 hours. Such credits must meet the requirements of the student's program and be approved by the Graduate Program Adviser and the Graduate School (see Appendix I). 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 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" (see Appendix I). After being signed by the student's Faculty Research Adviser, the Plan of Study is signed by the student and given to Chris Sutton in the Geology office for signature by the Graduate Program Adviser. When all is in order, the form is sent to the Graduate Dean for final approval and signature. See examples following.

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 form should be filed by the beginning of your third 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. coursework requirements. Courses not on the Plan of Study may be audited or taken Pass-Fail, at the students discretion.

THESIS M.S. OPTION IN GEOLOGY

Core Course Requirements

45 credit hours, including:

at least one quarter of full enrollment (10 credits)

6 credits of Geology 595 (brown bag seminar) two each quarter during the 1st year

12 credits of Geology 690 (thesis)

(you may take more than 12 thesis credits, but only 12 credits will count towards the 45 required credit hours, and only 12 will be graded.)

additional credits to be selected under advisement as appropriate for your area of specialty (consult with chair and with faculty members in your area of interest)

up to 9 transfer credits, by special arrangement only

with no more than:

16 credits per quarter

10 credits of 400-level course work

10 credits of independent study (Geology 500)

You must be registered for at least two credits during the quarter in which you graduate. Most students save two credits of Geology 690 for that quarter.

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 your core courses. Your core courses may include no grades lower than C- and no more than 10 credits with grades below B-.

DEPARTMENT OF GEOLOGY
SUGGESTED COURSEWORK BY SPECIALTY AREA
Thesis Option M.S. Degree

All students must take 6 credits of Geology 595 and at least 12 credits of 690 (thesis). Graduate Council rules require that you take 45 credits in your graduate program, no more than 10 credits of which can be at the 400 level. If your letter of acceptance specified prerequisite courses, you must also complete them, if you have not already. They do not count towards the required 45 credits.

In addition to the general requirements, you will be choosing a specialty for your thesis work, and the bulk of your courses will be related to that specialty. Your course of study is determined under advisement by the department chair and, once you know who it is, by your thesis advisor. The courses below have been selected by the Geology faculty as the most relevant for the specialties listed.

Economic Geology: undergraduate background should include mineralogy, petrology, structural geology, and stratigraphy and sedimentation; graduate work could include 406, 407b, 523, 524, 532, 550, 560, 561, 572, 573.

Tectonics/Geophysics/Structural Geology: undergraduate background should include mineralogy, petrology, structural geology, stratigraphy and sedimentation, geophysics, and strength in math and physics; graduate work could include 548, 550, 551, 552, 553, 554, 556, 557.

Geomorphology and Coastal Processes: undergraduate background should include mineralogy, petrology, geomorphology, stratigraphy and sedimentation, and structural geology; graduate work could include 513, 530, 540, 572, 573.

Hydrology and Applied Geology: undergraduate background should include mineralogy, geomorphology, geophysics, stratigraphy and sedimentation; graduate work could include 513, 561, 562, 570, 572, 573, 574, and appropriate courses in soils and potential field methods. Additional courses given by the Chemistry Department and Huxley College are recommended under advisement.

Paleontology: undergraduate background should include historical geology, paleontology, stratigraphy and sedimentation, and zoology; graduate work could include 524, 528, 536, 553, Biology 407, 490, 461, 503, 507.

Igneous and Metamorphic Petrology: undergraduate background should include mineralogy, petrology, optical mineralogy, structural geology, and stratigraphy and sedimentation; graduate work could include 523, 525, 550, 551, 553, 560, 561, 556 and courses in Chemistry selected under advisement.

Stratigraphy/Sedimentary Petrology: undergraduate work should include historical geology, mineralogy, petrology, structural geology, paleontology, and stratigraphy and sedimentation; graduate work could include 406, 407b, 516, 523, 524, 528, 536, 561, 572.

You are not required to take all the courses listed under your area of specialty, and some may not be offered while you are at Western. Other courses may be developed that would be good for your interests. Often an Independent Study course, Geology 500, may fit your needs. Your plan of study is developed in consultation with your advisors.

THESIS OPTION PLAN OF COURSE WORK WORKSHEET

First Year

Fall Quarter

Geology 595 (2 credits)

Winter Quarter

Geology 595 (2 credits)

Meet with faculty to develop thesis proposal.

Spring Quarter

Geology 595 (2 credits)

Thesis proposal approval.

By the end of Spring quarter, you should have:
completed Geology 595
cleared all entrance requirements
submitted an official Plan of Study
submitted a thesis proposal and Thesis Approval card

Summer Quarter

Thesis field work

PLAN OF COURSE WORK WORKSHEET

Second Year

Fall Quarter

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

Winter Quarter

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

Spring Quarter

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 coursework (Geol 690) may be undertaken until the student is advanced to candidacy. 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.

Thesis Registration

Because Geology 690 is a variable credit course, the student must register using a Variable Credit Course Registration Permit card (see Appendix I). The card must have the Faculty Research Adviser's signature. (The Faculty Research Advisor is the thesis committee chair.) A total of 12 credits of Geology 690 is required; however, you may take more thesis credits, for example, to maintain full-time status.

A "K" (incomplete) grade is given for thesis credits (Geol 690) until the thesis is completed. Then the final grade is given and the "Ks" become the final grade, e.g. K,K,K,K,A becomes A,A,A,A,A. 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.

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 no later than the end of the quarter before which the student wishes the degree officially recorded. Application is made using the "Application for Master's Degree" card (also called a blue card, see Appendix III). A diploma fee of \$23.00 (subject to change) will be charged. ***Do not apply for your degree until you are very sure your thesis is approved and when you will be defending. You are responsible for informing the Graduate School if you will not be defending the quarter you have applied for graduation in.*** 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.

Registration during Final Quarter

A student must be enrolled for at least two credits during the quarter in which the program is completed or during the preceding (calendar) quarter.

Graduation Checklist

1. Have I completed all prerequisite courses?
2. Have I been advanced to candidacy?
3. Have I completed all the courses listed on my Plan of Study?
4. Are all "K" (incomplete) and "X" (missing) grades taken care of?
5. 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?
6. Is my thesis approval card on file?
7. Have I completed at least 12 credits of Geology 690?
8. Have I registered for at least two credits during my final quarter during the academic-year quarter preceding the final quarter?
9. Has my thesis been defended?
10. Has the revised thesis been signed by my thesis committee and the Dean of the Graduate School?

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

CHAPTER 2: YOUR THESIS FROM PROPOSAL TO PRINTING

MS in Two Years Deadlines

Selecting a Faculty Research Advisor

The Thesis Committee

Thesis Proposals & Defense Signature Page

Proposal Cover Sheet Example

Thesis Writing

Approval for Defense Signature Sheet

The Thesis Defense

Thesis Title Sheets

Committee Signature Page

Authorization/Copyright Page

Title Page

Thesis Manuscript Regulations

Thesis Manuscript Suggestions

Thesis Copy/Duplication Guidelines

Thesis Copies

Thesis Collections

SELECTING A FACULTY RESEARCH ADVISOR (thesis committee chair)

One of the main things that students need to think about early during their graduate studies is selecting an advisor for their thesis work. You're not stuck with the person you were assigned to when you entered graduate school; you should find the faculty member whose interests, expertise, and advising style fit best with your own goals and personality. Although the WWU General Catalog and the courses you take are valuable sources of information about faculty, the most important resource in picking an advisor is other students, who can tell you what it's really like to work with a person, and your own experience seeking out and talking with the faculty.

There are several things you should consider in choosing an advisor, some obvious and some, perhaps, not. The following list is not intended to be exhaustive, but simply to suggest issues that you might want to think about when considering faculty members as possible advisors.

- ! What are their research interests, expertise, and theoretical orientation? Can they provide you with the guidance you'll need in writing your thesis? Will you be comfortable with the scientific approaches that they are likely to recommend?

- ! What will they be like to work with? Are they supportive, reliable, constructively critical, and able to communicate well with you? Equally important, and sometimes overlooked, how busy are they? Almost any advisor who is willing to work closely with you is likely to be more helpful than the "ideal" mentor who never has time to see you or read your work.

- ! How good are they at getting their students through the requirements and over the finish line? What is their advisees' track record in getting proposals (both grant proposals and thesis proposals) written and approved? How long do their advisees take to finish their theses? How well do they work with the other faculty members whom you might want on your committee?

- ! How long are they likely to be at Western? A temporary faculty member may no longer be at Western when you finish.

- ! Finally, although not every student will need to consider this, how helpful are they likely to be in getting you a job or into a Ph.D. program once you're finished? What is their reputation in their field, and how extensive is their network of contacts? How strongly will they support you when they write letters of recommendation?

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 card (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 card is taken to the Graduate School.

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.

What things need to be said in a thesis proposal?

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

- é An introduction to the particular problem that you will be trying to solve, including why the problem is worth solving.
- é 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 patterns of what has already been done.
- é 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.
- é The importance of the proposed research as compared to alternative approaches (a justification).
- é A description of the study area, and why that area was selected.
- é 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.
- é Plans for publication of the results.
- é 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 perhaps committee members).

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.)

Graduating in a Timely Fashion, in the first chapter of this handbook, also has suggestions for writing 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 (submit two copies)

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, and all maps, appendices, and such that will be in the final thesis.

Your committee members do not sign the defense table copies 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 both copies to the Geology Department office and tell them the date you prefer to hold your defense. 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.

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.

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 defend.

Thesis defenses are held at 4:00 p.m. so that they do not conflict with classes. For Friday defenses, 3:00 p.m. may be acceptable.

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.

TITLE OF THESIS

BY

(Student's Name)

Accepted in Partial Completion
of the Requirements for the Degree

Master of Science
(Your Degree)

Moheb A. Ghali, Dean of Graduate School

ADVISORY COMMITTEE

Chair, Dr. _____

Dr. _____

Dr. _____

Dr. _____

[*Please make sure to type the names below the signature lines.]

MASTER'S THESIS

In presenting this thesis in partial fulfillment of the requirements for a master's degree at Western Washington University, I agree that the Library shall make its copies freely available for inspection. I further agree that extensive copying of this thesis is allowable only for scholarly purposes. It is understood, however, that any copying or publication of this thesis for commercial purposes, or for financial gain, shall not be allowed without my written permission.

Signature _____

Date _____

Thesis Manuscript Regulations

1. **Language**

The thesis must be written in English. All members of your committee must be able to read and critically review the manuscript, and other Geology students should be able to read and cite it.

2. **Arrangement of Pages**

The following arrangement is required:

- a. committee signature page
- b. authorization/copyright page(s)
- c. title page
- d. abstract
- e. acknowledgments (optional)
- f. table of contents
- g. list of figures and tables
- h. text
- i. bibliography/references
- j. appendices (optional)
- k. vita (optional)
- l. pocket material (optional)

Note: The Geology office has the Master's Thesis Library Waiver, and the Graduate School has copyright application forms.

3. **Paper**

Use only 8_ by 11 inch, white, 16 to 20 pound bond paper, and type or print on only one side of the page (except for captions for large figures, which may appear facing the figures). Recycled paper is available through the Print Plant (650-3914). Order it a few days in advance.

4. **Typing and Printing**

Use the same style of type or print throughout the manuscript. You may use bold or italic letters or underline words where appropriate.

Typewriter. Use either pica type (10 spaces per inch) or elite type (12 spaces per inch), double-spaced.

Word processor and printer. Use either 9 to 12 pitch size, double-spaced. Use a letter-quality printer.

5. Margins
Top, bottom, and right-hand margins should be at least one inch. Left-hand margins should be at least one and one-half inches, to provide room for binding. Use the same margin dimensions throughout the manuscript, except for indented lengthy quotes. Page numbers should not intrude into any margin space.

6. Pagination
Page numbers should be in the upper right-hand corner or the bottom-center of the page. The numbers should appear alone, without any bracketing dots or dashes. As noted under Margins above, page numbers should not intrude into any margin space.

Preliminary pages. Use small Roman numerals. The committee signature page, authorization/copyright page(s), and the title page are counted but not numbered. Therefore, the abstract will be the first page with a number.

Text. Use Arabic numerals. The first page of the text is counted but not numbered. Therefore the second page of the text is page number 2, and this numbering series follows through to the last page, including pages with figures, the bibliography, and the appendices.

7. Title Page
Always put the date on your title page. The date should be the month and year in which you hand the signed thesis to the Graduate School office for the Dean's signature.

8. Headings
Section headings must correspond to the table of contents, and heading type and location on the pages should be consistent throughout the thesis.

Primary headings are centered and all in capitals. Primary headings, which begin major sections of the thesis, should begin a new page.

Secondary headings are centered with all words except articles and prepositions capitalized.

Third-level headings begin at the left side of the page. All words except articles and prepositions are capitalized.

Fourth-level headings resemble third-level headings, except they are indented.

Headings may be bold-printed or not, as you wish. If you do not print them in bold, double the space between the heading and the text that follows it.

9. Captions
Captions should be in the same type or print style as the text, but the lines may be single-spaced. Captions come under their figures.

10. Basic Typing Rule
ALWAYS double-space at the end of a sentence and following a colon!

Thesis Manuscript Suggestions

Common Errors

Manuscripts must be clean of typos, spelling errors, and serious grammatical errors. The following list indicates the major types of errors that have led past theses to be returned unsigned by the Dean of the Graduate School. Proofread carefully to avoid these (and other) errors.

Spelling

Run a spell-check if you are working on a computer, but watch out for homonyms such as here-hear, you-you're, its-it's, and their-there-they're.

Typographical Errors

A spell-check will catch some typos but will leave those that form words. Proofread carefully, preferably at least a day after you last worked on a section.

Grammar

The most common grammatical mistakes are mixed tenses and mixed numbers (e.g., singular subject with plural verb) within a sentence. Also avoid excessively long sentences.

Citation-Reference

There must be a reference for each citation in the text and a citation for every reference in the reference list. The spelling of the author's name and the publication year must match between citation in the text and the reference entry. Where there are multiple citations in one set of parentheses, they must be either in chronological or alphabetical order, with the order consistent throughout.

Be consistent in citation and reference style throughout. Pick a geological or geophysical journal and use its style. Consult with your thesis advisor about an appropriate journal. Geological Society of American Bulletin has one commonly-used style, but you may prefer to use the style of the journal in which you plan to publish your results.

Drafts

Your committee will be better able to help you (and more disposed to help you) if you avoid these errors in drafts as well as in the final thesis. You should make each draft as good as you possibly can before giving it to committee members.

Proofreading

It is essential that you review your manuscript carefully and repeatedly before you consider it accurate and complete. This is your responsibility and should be done for all drafts as well as for the defense copy and the final copy. Leaf through the manuscript to see that all the pages are included and numbered correctly, then check again that heading types and locations are correct. Read the text carefully looking for errors in typing, spelling, and grammar. Go through it again checking every citation against the corresponding entry in the reference section.

A good example to use for checking form would be Ben Farrell's thesis, #165.

Computer Files

We highly recommend that you type each major section of your thesis as a separate file on the computer; in the event of a computer/disk/file/user error, only a portion of your work will be lost. Also, remember to back up your work frequently.

Thesis Copies

Three hard-bound copies with all photos and maps must be given to the University (one for the Geology Department, two for the Graduate School, both of which are accessioned in Wilson Library); give them all to the Chair's Assistant and she will distribute them. In addition, the Department of Natural Resources wants a soft-bound copy of any thesis done concerning the state of Washington; they will pay you 5¢/page and \$2.00/map. Give this copy also to the Chair's Assistant, and she will forward them to the State Library with a request that payment be sent to you.

The Chair of your thesis committee and the other committee members should be asked if they want copies. Generally they will. Order these copies with the others.

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 2002/2003 is \$8,763 2. Student pays a portion of tuition upfront when registering (for 8 cr. = \$409.82, 9 = \$455.45, 10 = \$501.03), the health fee and other misc. fees. 3. A partial tuition waiver is in effect for all <u>full-time assistants</u>. Out-of-State tuition is also partially waived for non-residents who are full-time assistants. 	Students may not have other WWU employment. Student Accounts monitors credit load If students drop below 8 credits or withdraw, they are ineligible for the waiver, which must then be repaid. If the student is a non-resident, only in appointment (not half) as a TA qualify him/her for partial reduction of the out of-state tuition. Students are obliged to provide 20 hou per week of supervised service.
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.					
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.	Bureau for Faculty Research checks for eligibility requirements. BFR forwards department initiated PA.	<ol style="list-style-type: none"> 1. Salary determined by grant budget. 2. Most grants pay tuition. 	Graduate Office monitors registration and cancels appointment if credits fall below eight. Students are obliged to provide 20 hou per week of supervised service.
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>	Student may not hold a full-time TAsh Student Accounts monitors the numbe of credits registered for. If student fall below, student is billed by Student Accounts for the difference of in- and out-of-state tuition.
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).	Student may <u>not</u> have either a full or h time TA appointment. Student accounts monitors student's credit load. If credit load is below 10, scholarship is canceled.

APPENDIX 1:

WWU FORMS

When you are ready to file these forms,
copies are available from Chris Sutton in the
Geology office.

Sequence of Procedures for the Master's Student

Directed Independent Study Registration Permit

Variable Credit Course Registration Permit

Request for Exemption/Transfer Credit

Graduate Plan of Study

Thesis Topic Approval Card

Application for Master's Degree (blue card)

Master's Defense Form (for thesis defense)

Recommendation for Master's Degree

Name Change Card

APPENDIX 2: FINANCIAL AID

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

Financial Aid Options

Application for Waiver of Non-resident Tuition and Fees for
B.C. Residents

Application for Graduate School Assistantship

Graduate Minority Fellowships

APPENDIX 3: RESEARCH GRANTS

Forms for the current year are available from Vicki in the Geology Department Office.

Funds for the Enhancement of Graduate Research

Graduate Student's Travel to Conferences

Sigma Xi Grants-in-Aid of Research Application

AAPG Grants-in-Aid Application

Geological Society of America Research Grant Application

GSA Research Committee Evaluation Checklist

Example of a Successful GSA Research Grant Application

Department of Geology Research Awards Announcement

Mazama Research Grants Announcement

Northwest Fund for the Environment Announcement

APPENDIX 4: ABSTRACTS

These forms are for 1994. Vicki in the Geology office has up-to-date GSA forms, which may be somewhat different. AGU instructions appear in EOS.

GSA Instructions for Abstracts

GSA Abstract Submittal Form

"What Happened to My Abstract?"

AGU Abstract Instructions

Geological Association of Canada Judge's Report for Poster Sessions

Appendix 5: PREPARING SLIDES FOR TALKS

Effective Slides

Additional Tips for Better Slides, Using WWU Equipment

Effective Slides

Good slides amplify and clarify the message, stimulate interest, and help the speaker keep "on the track". They merit the same care in preparation as the commentary. Ideally, the speaker should work with a specialist who can translate information into effective visuals, and who will instruct an artist and a photographer in making slides. Whether or not such assistance is available to you, here are some of the ways to make effective lecture slides. While the emphasis here is on 2x2 in. (50x50 mm) slides, the general information applies also to other projected visuals.

Avoid Errors

Most errors in slide making stem from the mistaken assumption that legibility in one form assure legibility in another. A person ordinarily reads printed material at a distance of 12 to 14 in. (305 to 356 mm). But frequently at a slide presentation the image projected is only 4 x 6 in. (1.2x1.8 m); the rear seats are 70 ft (21.3 m) from the screen! Reading the text of a 4-ft high (1.2 m) image at 70 ft. (21.3 m) is like reading a 1_x1_in. miniature version of this page. Only the titled would be legible. The rest of the text would be a visual jumble of tiny black spots. Plan line weights of charts and graphs carefully for greatest legibility. Make curves prominent. Construct axis and grid lines so they are clearly visible but relatively inconspicuous.

Important Points

Format

- ! Limit each slide to one main idea.
- ! Use a slide series for progressive disclosure-it clarifies greatly.
- ! If field photos are used, don't try to illustrate the entire stratigraphic sequence with one photo; be sure the picture was properly exposed and had adequate color density for large size projection.
- ! Use several simple slides rather than one, especially if you must discuss a subject at length.
- ! Use duplicates if you need to refer to the same slide at several different times in your talk. It is impractical for the projectionist to search for and reshow a slide.
- ! Include titles to supplement, not duplicate, slide data.

Color

- ! Use 2x2 in. (50x50 mm) color slides--they are effective, easy to make, and inexpensive. Color film is also convenient for making slides from black and white copy.
- ! Stark black on white (or white on black in some cases) can be eye-tiring. White lettering on blue background achieves excellent legibility. Also, consider a light blue, green, or yellow (not red) background.

Letter Size

- ! Be certain that lines and lettering can be read from any point in the room. An easy tests is that if you can read all the information on the slide with unaided eye, it will project properly. This test can be applied only after the slide is prepared. In copy preparation, you can assume that you will achieve this if you confine yourself to a 7x10 in. sheet of paper,leave a 1 in. blank on all sides, use no lettering less than 5 mm high and no line width less than 1 mm, avoid serif or italic type, and keep you lettering on a horizontal.
- ! Leave space--at least the height of a capital letter--between lines.
- ! Limit each slide to 15 to 20 words, or 25 to 30 elements; no more than you will discuss. Crowded tabular data should be avoided.

Presentation

- ! Plan you slides for a good visual pace in your presentation. Don't leave a slide on the screen after discussing its subject.
- ! Thumb-spot all slides in the lower left corner when the slide reads correctly in hand viewing. Add sequence numbers.
- ! Rehearse your slide presentation several times so that you will be familiar with the sequence and timing of the slides.
- ! On your trip, carry your slides with you--in the tray, if possible. Don't trust them to your baggage if it is checked through.
- ! Use the Speaker Ready Room to review the order of slides.

This article is a combination of information reprinted with permission of the Kodak Company, Inc. and the Geological Society of America.
Reprinted from: Geological Society of American News & Information, July 1985.

ADDITIONAL TIPS FOR BETTER SLIDES, USING WWU EQUIPMENT

Camera

1. Use Ektachrome film with color correction filters (in photo lab).
2. Use grey card for light-metering.
3. Turn off overhead florescent lights.
4. Use matte gloss when possible.
5. Fill frame with figure, right to the edges!

Figures

1. Make lines 1/3 larger (wider) than for printed figures.
2. Use color where possible.
3. Only one idea or concept per slide.
4. Keep words and labels to a minimum; explain them rather than just project them.
5. Crop figures (with camera) to exclude unnecessary areas.

For pseudo-blue with white lines, use Kodacolor VR film and have only the negatives processed (no prints) and use a yellow filter on the camera. Remember to meter with grey card and make lines heavy on figures.

or, see next page.