

**Department of Earth Sciences
Master's Degree Handbook**

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Dated: August 20, 2004

Updated links: August 18, 2005

INTRODUCTION

Welcome to the Department of Earth Sciences at Montana State University. The faculty and staff hope that your graduate experience at MSU will be rewarding and will help you reach your future goals. Graduate school is intended to be challenging and intellectually rigorous, but at the same time, we hope you will find it a positive and enjoyable experience. The purpose of the graduate program is to provide students with the opportunity to extend their knowledge in a specific field as well as develop their capability in critical thinking and originality in research.

The information contained in this document has been assembled for the convenience of graduate students and advisors in Earth Sciences. Graduate students are expected to become thoroughly familiar with the regulations of this document and that of the Graduate School. Failure to follow these regulations and observe the degree requirements inevitably results in complications and quite often delays progress toward completion of the degree. It is each student's responsibility to meet all deadlines regarding their graduate program.

All policies listed in the **Graduate Catalog** apply to all Master's degree candidates in the Department of Earth Sciences. The items in this document apply to all Master's degree candidates in the Department of Earth Sciences unless specifically indicated otherwise. Within the Department there is some variation in the specific expectations for candidates in geography, geology, and earth science.

PHILOSOPHY

We strongly believe in a well-rounded graduate education and discourage extreme overspecialization at the Master's level. Therefore, our graduate program is designed to expose you to a variety of topics to broaden your background and build on your undergraduate education. Professional earth scientists with a broad-based scientific background are invariably the most versatile and "survivable" in the job market.

The most important aspect of graduate school that distinguishes it from undergraduate study is self-education and self-motivation. Graduate school is what YOU make of it! Although you will take courses from professors, the bulk of your graduate education will be obtained through independent (but guided) research related to your thesis project. You will learn to pose useful research questions and pursue the answers on your own; don't be afraid to work hard for answers to difficult questions. That is what graduate research is all about! Ultimately, you must solve research problems using your own unique, hard-won insights. The bottom line is: how much you learn and what you learn is up to you.

The role of faculty in graduate education is also significantly different than you may have experienced in undergraduate school. The faculty are here to advise and guide you through the graduate learning process, but, because you will take relatively few courses, classroom learning from a professor takes a back seat to independent study. Our most successful graduate students are those who quickly learn that self-education, coupled with a high degree of self-motivation, are the keys to success.

DEFICIENCIES

Most graduate degree candidates in the Department of Earth Sciences will have at least an undergraduate minor in their graduate discipline (e.g. geology). However, the broad focus of geography often attracts applicants from other fields. Incoming graduate students who do not have an undergraduate geography major will be required to enroll in and complete with a grade of B or better ESCI 112, Physical Geography; GEOG 201, Human Geography; and GEOG 211, Map Skills. In addition, each student will take a 200 or 300 level geography course that provides a broad basis of understanding in his or her individual specialty (e.g., GEOG 332, Economic Geography; GEOG 234, Geographical Planning; or GEOG 210, Weather and Climate). This four-course requirement in no way restricts the advisor or graduate committee from requiring further remedial work specific to the student's chosen topic of research. The graduate committee will determine if prior courses that the student has taken can fulfill any of the above requirements. Any 400 level courses used to make up deficiencies cannot be used to satisfy the course work requirements of the master's program (see below).

Deficiencies identified in the preparation of candidates in [geology](#) and [earth science](#) programs will be identified and addressed by the candidate and her/his advisor.

GENERAL GUIDELINES

All new graduate students should report to the Earth Sciences Administrative Associate upon their arrival at MSU. An orientation meeting with the Department Head and faculty will be scheduled for the first week of the semester. New graduate teaching assistants are required to attend the teaching assistant seminar the week before classes begin.

Advisor

Your advisor is the primary contact for each graduate student and assists the student in all matters related to graduate study. Your advisor is assigned upon acceptance into the graduate program. Prior to the start of the first semester of residence each student should visit with their advisor (assigned when you were accepted). You should:

1. Review your background,
2. Discuss any deficiencies you have and how these deficiencies will be made up,
3. Discuss thesis areas of interest,
4. Discuss possible committee members,

Graduate Committee

The advisor and graduate committee share responsibility for overseeing the student's academic and research progress. This committee is selected by both the student and advisor on the basis of their qualifications to directly assist in the student's coursework and thesis programs. A majority of this committee must be chosen from the tenure-track Earth Science faculty - the geography program requires at least two geographers and the geology program at least two geologists. The Department requires that you establish your graduate committee and hold a meeting to review your graduate program before the *end of the first semester* of residence as a graduate student. After this, you should not hesitate to call a graduate committee meeting if you have academic or research problems. Normally, the graduate committee should meet once per semester, but may meet more frequently when committee consensus is needed on coursework or a research question. When in doubt, ask your advisor. The committee and program are approved by the Department Head and submitted to the Graduate School. An approved committee form must be on file before a student's coursework program can be approved by the Department and Graduate School.

Coursework

The coursework program is planned by students in concert with their advisor and committee, approved by the committee and the Department Head. The program must be submitted to the Department and Graduate School no later than the *end of the first semester*. The members of the graduate committee must initial the original copy of the program form before it is submitted to the Department Head and Graduate School. Students on university fee waivers, having fees paid from a grant or receiving a compensatory stipend to cover fees, must register for a minimum of 6 credits per semester (during the academic year and 3 credits per summer semester). However, if you register for more than six credits, you will not be eligible for residency a year after entry. See the Montana Board of Regents Residency Policy for specific guidelines. See the Graduate Catalog for other requirements that may apply.

General Credit Requirements for Master's Degrees

- from the College of Graduate Studies Catalog for Master's Students

1. The *minimum credit requirement* for master's degrees varies from thirty (30) credits upward, depending on the degree

2. Only those courses listed on a graduate program are applicable toward graduate degree credit requirements.
3. *Non-thesis credits*: In all non-thesis programs, at least thirty (30) credits or more as determined by the department) must be for content coursework (not thesis credits.)
4. *500-level courses*: A minimum of two-thirds of the program (including thesis) must be comprised of 500-level courses. Some departments may require a higher percentage.
5. *Major area*: 50% of the degree minimum credit requirements must be taken in the major area of study.
6. *Minimum credit registration* for students taking comprehensive exams and during the term of graduation is three (3) credits.
7. *Undergraduate credits*: A maximum total six to nine credits of all 4XX and 5XX level courses taken at Montana State University *prior to completion* of a baccalaureate degree may be reserved and applied toward graduate program requirements with the approval of the student's graduate committee and Graduate Dean.

The geography requirements consist of two mandatory courses (ESCI 500-01 and GEOG 405) and at least 3 (three) 500-level departmental courses. Additional coursework for a total minimum of 20 credits can be chosen from 400 or 500 level courses in geography or other related rubrics (i.e., geology or earth sciences, biology, history, political science, soil science, etc.). Students are encouraged to take additional coursework that contributes to their thesis topic from other departments, but a minor in another department requires representation on the graduate committee.

In geology, a minimum of two graduate courses must be taken from two different geology faculty. Academic programs in geology and earth science must meet the guidelines of the College of Graduate Studies and be acceptable to the graduate committee.

In addition to your coursework, it is required that all graduate students attend the weekly departmental seminars on a regular basis. These seminars expand the breadth of your knowledge in the geosciences.

Comprehensive Examination

The Department requires an oral comprehensive examination, scheduled and administered under the guidelines of the College of Graduate Studies. The purpose of the geography exam is to demonstrate proficiency in two or more broad subfields of Geography (e.g. geomorphology, urban) that are most relevant to the student's proposed thesis research. The student's graduate committee shall designate the relevant subfields and administer the exam questions.

For the geology oral comprehensive examination, the student will be expected to demonstrate an adequate knowledge of general geology (at the M.S. level), in addition to specific areas of thesis expertise. The entire Departmental faculty are welcome at geology comprehensive examinations. Any faculty member may ask a question, but only the student's graduate committee will vote on passage or failure of the comprehensive exam.

Comprehensive examinations for candidates in earth science will be similar to those within geography or geology, as determined by the advisor, graduate committee, and candidate.

All students may: (i) pass the exam with no provisions; (ii) pass with the provision that additional coursework be taken in appropriate subfields, or (iii) fail the exam. The comprehensive examination may be retaken only once and may be retaken no sooner than 30 days after the first comprehensive examination.

THE THESIS

Thesis Proposal

Students should complete a comprehensive and workable thesis research proposal early. The proposal should be approved by advisor and committee no later than the end of the second semester and preferably by the end of the first semester of residence. Thesis topics are chosen in collaboration with the student's advisor; students supported by research assistantships may be constrained by the grant which supports the work. The topic should be consistent with the interests of the advisor and approved by the advisor and committee.

The following elements are typically included in a research proposal:

- Title, name date, department, institution
- Clear statement of the research question and its importance or relevance to existing knowledge
- Hypothesis to be tested (typically based on a thorough literature review)
- Methodology
- Detailed timetable (based on methodology)
- Expected outcomes, products
- Budget

A flexible number of credits (1-10) are allowed for thesis registration during any given semester. Full-time students who are doing thesis work should register for an average load of 6-15 credits per semester (see Example Timetable below). This can be accomplished by adding thesis credits to the coursework credits each semester to bring the total up to this expected load. Thesis grading is Pass/Fail. *Students working toward residency may take no more than six credits in the first year and may take more in the second year.*

Thesis Writing

A manual entitled *Preparation Guide for Theses, Dissertations and Professional Papers* is available online from the Graduate College and is to be followed by the student during the preparation and submission of the thesis. In citation of references, bibliography, and graphics Geography thesis preparation must follow the *Guide to Authors from the Annals of the Association of American Geographers*. Geologists must follow the format of the *Geological Society of America Bulletin*. Earth Science candidates will follow one or the other of these formats with the advice and consent of the advisor and graduate committee. A thesis may be written in professional publication format. However, it must still include supporting material documenting the depth of the candidate's research, expression of appropriate uncertainty regarding conclusions, discussion of dead-ends if appropriate, and suggestions for future work. Appendices may be attached at the end of a thesis to archive field and/or laboratory data, tables, etc. In most cases the Department recommends writing a thesis, then editing it for publication.

Thesis Funding

Common Sources for Thesis Research Funding

- A. Research Assistantship. As an "RA", one works on a project already funded through a faculty member (such as an NSF grant). However, this mechanism is available on a very limited basis. A research assistantship (RA) is employment related to a specific research problem under the direct supervision of a principal investigator (usually a faculty member). Salary and equipment are paid from a grant to the principal investigator through the university administration. Normally the pay is comparable to a TA position and the job involves 15-20 hours per week. Fee waivers are sometimes available. Typical RA jobs include collecting data (either in the field, lab or archives), mapping, aerial photo interpretation, analyzing data, etc. RA positions are a good opportunity to obtain experience in research methods and develop some skills that you might not already have. Check with individual faculty to see if RA positions are available in your area of interest. Some grants hire RA students with no thesis expectations. Some require a thesis at the end of the work in which case the faculty member with the grant is your advisor. *Whether you finish or not, the data collected by a funded grant is the property of the University and the Principal Investigator which provided the support.*

- B. Professional Society Grants (e.g., G.S.A. and A.A.P.G.) in the \$500 - \$3,000 range are competitively offered to graduate students, with masters proposals typically funded in the lower half of the range. See the Web pages of organizations relevant to your proposed research.
- C. Montana Bureau of Mines and Geology in Butte occasionally supports student research in areas of interest to their staff, such as minerals exploration or groundwater. Check with your advisor before proceeding with an inquiry.
- D. Petroleum and minerals exploration companies have traditionally supported graduate thesis research, ranging from a few hundred to several thousand dollars. Check with your advisor prior to applying to companies.
- E. The office of the Vice-President for Research maintains several resources for funding. Contact them early in your career to become aware of the breadth of available programs supporting graduate research.

In all cases, check with your advisor prior to applying for funding of any type that is related to your graduate program.

Thesis Defense

In addition to oral comprehensive exams, a student must pass an oral defense of thesis. We require that a copy of the thesis be placed on reserve in the department's main office at least one week prior to the scheduled public thesis presentation. The purpose of this is to give other persons in the department, especially faculty not on the candidate's committee, a chance to review the type of research that graduate students are doing. It is the responsibility of the graduate student to make sure this is done at least one week prior to the defense of thesis.

The thesis defense will consist of two parts: 1) oral presentation of the research project to the whole department, during which faculty and students may ask questions; 2) after the presentation, the candidate and his/her committee will meet for further questions. Faculty not on the committee may attend the defense, but may not vote on the outcome. Students other than the writer are not permitted at the meeting following the oral presentation, but are encouraged to attend the oral presentation. The latter phase of the exam typically takes 2-3 hours, although more or less time may be taken as deemed necessary. At the end of the oral defense, the committee will vote to pass, not pass, or pass with required revisions to the thesis. If failed, the examination may be repeated only once and not less than two months after the first exam. Failure of the second exam will lead to termination of graduate study.

Because there are several critical, inflexible thesis deadlines, you should check the dates with the Graduate College prior to the semester in which you plan to defend and plan your schedule with your advisor and graduate committee accordingly. No defenses or comprehensive exam will be administered by the Earth Sciences Department in the summer.

Thesis Submission

MSU participates in the *Electronic Thesis and Dissertation Program* (ETD) which allows students to submit theses and dissertations electronically. Not only does this process lower your printing and reproduction costs, it allows wider access to your work. An overview with guidelines and benefits can be found at MSU's *Electronic Thesis and Dissertation Initiative* (ETD) site. However, care should be used with color figures; use color only when information cannot be communicated without color. Color remains very expensive in professional publications.

With electronic submission, you are also required to provide the Department, your advisor and your committee with electronic copies on CD. These CDs are to be clearly marked with your name, title and date of submission.

Printed copies of your completed thesis may still be required; your thesis advisor can help you determine when this is appropriate. Some circumstances are suggested below:

1. Granting agencies and companies - as per their requirements (usually 1 to each granting entity)
2. Other courtesy copies - landowners, parents, friends, etc.
3. Montana College of Mineral Science and Technology Library in Butte ("Montana Tech") - they are willing to pay for 1 copy and are most eager to have all graduate theses that deal with Montana geology.

As a matter of Department policy, the thesis advisor will not sign the approval page of the final draft (prior to submission to the Graduate School) until she/he has in hand:

1. Sufficient CD and/or paper copies for the department, committee and others as deemed appropriate by the thesis advisor (for funding agencies, etc.) and
2. Electronic copies for the Department, your advisor and your committee.

Thesis Publication

We expect the critical aspects of all theses to be published in the appropriate professional literature. It is generally expected that the advisor and perhaps one or more committee members will be co-authors of the paper.

If time constraints prohibit the student from submission for publication within one year after final approval of the thesis, the advisor or committee will be entitled to do so. Authorship may be negotiable, but in most cases (except when thesis work is a part of a larger product) first authorship resides with the student. Publication guidelines are available from each major society or journal which describes their preferred format and requirements.

APPENDICES

TEACHING ASSISTANTSHIP

Teaching Assistantships (TAs) are commonly awarded to support both the undergraduate instructional program of the department and otherwise unfunded graduate students. They often carry with them waiver of out-of-state tuition and fees. Students (U.S. residents) are strongly encouraged to obtain residency as soon as possible. The Department does not provide non-resident fee waivers or increased stipends (to cover fee waivers) beyond the second semester following enrollment in a graduate program. NOTE: You cannot achieve Montana residency as a full-time student (7 credits or more). You MUST take at least 6 credits to qualify for a TA. Thus, students should take exactly 6 credits in each of their first two semesters. Action to establish residency should take place prior to the first day of classes. See the Montana Board of Regents Residency Policy for specific guidelines. You may apply for a TA at the time of application to Graduate School, and on a yearly basis. Teaching assistantships are awarded on a semester-by-semester basis depending on performance. A typical TA award will be for a year unless severe problems develop with the TA, the university has a fiscal crisis, or other arrangements for support are made. TA awards are generally not extended beyond the second year of graduate study in the Department of Earth Sciences.

If you do not receive a TA upon admission to the Graduate School and are still interested in one, you may apply for a TA for your second year as indicated below. During spring semester, a memo is sent to all graduate students in the Department asking for TA applications for the following year. Your formal letter of application for a second year of TA support should include information regarding why you are interested in a teaching assistantship and why you would make a good TA. These applications are screened on the basis of academic progress in the graduate program and the quality of the application itself.

A TA is an employee of the Department with a significant time, energy and emotional commitment to the Department's mission of undergraduate education. The workload of a TA may negatively impact your thesis progress - if you let it. In addition to its regulations regarding assistantships, the College of Graduate Studies hosts an online manual of *Teaching Tips for Teaching Assistants* that includes advice regarding your transition from student to teacher. Teaching assistants are an important part of the teaching staff in the Earth Sciences Department and it is a job that should be taken very seriously. Teaching assistants are typically in charge of

laboratory instruction and paper/test grading, as well as providing assistance during lectures with projection equipment or other visual aids, and assistance to students with questions at appointment times. Due to large introductory classes, the teaching assistants are a major source of information regarding the performance of individual students and thus play an important role in the grading process. Teaching assistants are required to maintain the laboratory equipment in good working order, attend semester "weekend cleanup" sessions, and most importantly, are required to be available during finals week to assist the Professor in compilation of final grades. In addition to assisting the professors, you are an important contact and role model for younger students. Your work, behavior and attitude may well make the difference between a student's positive attitude toward the class and a negative one. Many majors are attracted to our disciplines by TAs, so do your best!

The Teaching Assistant as Part of the Teaching Team

- A. As a graduate teaching assistant, you are a vital member of the MSU Earth Sciences teaching staff. Through your help, we can offer a broader range of upper-division and graduate courses than would be possible if the faculty were solely responsible for departmental teaching.
- B. Teaching assistants who have worked with us in the past years have expressed their appreciation for this experience and its contribution to their personal scientific knowledge, development, and credentials. Many career positions have developed through the TA route. The limited financial reward is more than matched by the other rewarding aspects. The TA position, in turn, carries with it strong and important responsibilities. We welcome the valued and carefully selected individuals who join us in these activities.
- C. In order to maintain a clear understanding of the extent of T.A. duties, we have drawn up the following guidelines. You are expected to familiarize yourself with them and refer to them when you have procedural questions.

Dates of Responsibility

- A. You are responsible for work and teaching in the department from the beginning of each semester to the time when final grades are posted for the classes in which YOU are assisting. Check the Course Calendar and the Final Examination Schedules in the MSU Schedule of Classes for these dates and make your plans accordingly.
- B. If you must be absent at any time during these periods, you must (1) arrange for a substitute from among the other teaching assistants, and (2) clear your absence and substitute with the instructor. Do this as far in advance of your absence as possible.

TA Duties

- A. Obtain and read the syllabus and text for the course in which you are assisting.
 - 1. Read the syllabus. Know what material is being covered in lab and lecture. Know the sequence of subject matter.
 - 2. Read the textbook assignments. Most of this material is review, but you must know what information the students are reading in order to adequately answer their questions in lab. This reading is also excellent preparation for the comprehensive exam!
- B. If you are a teaching assistant in a course for the first time, you must attend lectures. You will be asked to assist with visual aids. This requirement is also excellent preparation for the comprehensive exam.
- C. Lecture examinations:

1. You may be requested to submit questions for lecture examinations and to proofread the exam prior to final printing.
 2. You are required to monitor exams. Be ready at least fifteen minutes prior to exam time.
 3. Grading the exams and tallying exam scores may be a joint effort, involving the instructor and the teaching assistants. This can be a time-consuming venture, so plan your schedule accordingly. For dates, see the instructor in charge of the class.
- D. Teaching assistants are responsible for a good portion of the students' grades in the courses. Thus, you must be present when final course grades are tallied and posted and must submit a copy of your grade sheets before that time.

TA Lab Duties

- A. Some weekend work will be expected, especially toward the beginning and end of each semester. This may include (1) organization of the lab room, (2) organization of specimens and materials, (3) assisting on class field trips, (4) field trips to gather samples and materials, and (5) reorganization of the lab manual.
- B. Some evening work will be expected. Review labs are conducted once per week during the evenings and teaching assistants take turns conducting them.

Lab Procedure

A. Before the lab:

1. Read the lab, examine the specimens, and do the exercises. Be sure that you fully understand the lab material. If you don't, ask the instructor! We are happy to help you MASTER the material!
2. Be sure that the necessary specimens and materials are in the lab and ready for the students.
3. Plan and outline your introduction to the lab.
4. Make sure that the lab room is neat and clean as possible and that it is well-illuminated, well-ventilated, and at a reasonable temperature.

B. During the lab:

1. Announce office hours and office number at your first lab. Post office hours on your cubicle or door during the first week. You should attempt to have office hours every day, but not at the same time every day. Inform the main office of your office hours.
2. On your syllabus, clearly establish and publish a grading policy, times and types of quizzes, and grading formula. Quizzes should be short, not more than 15 minutes. Quizzing and grading should be as uniform as possible through out a single course. Large discrepancies contribute to poor morale and should be avoided.
3. Establish and publish the attendance policy - *all students must complete all lab work*. This policy should be consistent through the labs in a given course, so you will need to get together with other TAs in the course.
4. Take roll and keep the instructor informed of enrollment changes and problems.
5. Introduce each lab. This is not to be an extended lecture! If your introduction takes longer than ten minutes,

it is too long and you are depriving students of valuable lab time.

6. Circulate around the lab, asking and answering questions. Your job is to be sure that all students understand the work. Don't answer all questions directly; try to get students to derive answers through a short series of directed questions.
 7. During the last ten minutes of lab, try to summarize the lab work. You won't be able to review all questions, but you will have time to go over enough of the material so that students will have a grasp of what you expect in the way of answers.
 8. Lecture as little as possible during the lab. Lab time is for hands-on experience and active learning by the student. Lecture steals time from those important student centered activities.
- C. After the lab, clean up and reorganize the lab room and materials. The lab must be left in good shape and ready for the next class.

End of the Semester

- A. Students in your class should fill out an evaluation form during the last or next-to-the-last lab period. This form should be handed out, collected and returned to the testing center by a student in the class. You won't see these evaluations until after grades are posted.
- B. Meet with the course instructor after all have had a chance to review the evaluations. Discuss and write out strategies for improvement of teaching.

Weekly Meetings

You are required to attend the weekly meetings of teaching assistants with the instructor. These meetings will usually take an hour, so plan accordingly. During these meetings, the previous lab will be reviewed and the next lab will be discussed in terms of materials, procedures and techniques. General problems will also be discussed and logistical matters will be clarified.

Terms of Contract

Appointments are on a semester-by-semester basis and are renewable, contingent on (1) teaching performance, (2) maintenance of a cumulative 3.0 GPA, and (3) carrying an academic load of seven credits. However, your employment may be terminated at any time for just cause.

EXAMPLE TWO-YEAR TIMETABLE

The masters program in the Department of Earth Sciences is intended to be a two year program. This is achievable and has been accomplished by many past students. However, the majority of graduate students take two - three years to finish. Reasons for this include taking a job before turning in the completed thesis, not choosing a thesis problem early enough to finish in two years, field work not completed during the first full field season, "writer's block" during thesis writing, stretching out the course work, recreational activities and other reasons. A TA or RA may also delay thesis progress if you do not manage your time effectively. A TA is a half-time job and, with courses, you will need to work more than 40 hours per week to finish in two years. We encourage you to stick to the two year plan and finish your thesis as soon as you can. Graduate school is definitely not a career or an end in itself. Time and money are lost by taking longer than two years and you may hinder the research productivity of faculty. Each day you are in graduate school, you not only pay tuition but also are NOT paid a salary.

There are several required hurdles you must clear to graduate: course work, thesis research, comprehensive examination, thesis writing and oral defense of thesis. To clear these hurdles in 2 years requires careful attention and dedication to a timetable.

Sample Two-Year Class Schedule

FIRST YEAR

Fall Semester

1 cr Research Sem
1 cr GTA Sem
1 cr Thesis or faculty seminar
3 cr Course

Spring Semester

3 cr Thesis or course
3 cr Course

SECOND YEAR

Fall Semester

3 cr Course
3 cr Course
3 cr Thesis

Spring Semester

3 cr Course
3 cr Course
3 or 4 cr Thesis

This adds up to 10 credits of thesis and 20 credits of coursework, as required. Note that there is flexibility to move course and thesis credits, but that EXACTLY 6 credits should be taken in each of the first two semesters, if you wish to earn in-state status.

First Year -Fall Semester

1. Meet with your assigned thesis advisor and develop a program of study early in semester. Be sure to plan to take deficiencies identified in your acceptance letter.
2. Each new graduate student should schedule an appointment with other faculty members to get acquainted, discuss the graduate program, discuss research interests and explore committee membership.
3. Plan a two-year program of study with your advisor. Discuss thesis research topics and begin to write a thesis proposal.
4. Before the end of the first semester in residence, you must select a graduate committee and discuss with the committee members your thesis proposal. A formal committee-approved program should be submitted to the Department and Graduate School before the end of this semester.
5. An in-depth thesis proposal should be written, reviewed by your advisor, rewritten, approved by your advisor, and submitted to your committee. Committee review may require more rewriting.

First Year -Spring Semester

1. All graduate students should enroll for at least 3 credits of ESCI 590 (thesis) to conduct an extensive literature search on their thesis topic. The thesis problem should be refined and fully researched. Meet with your advisor weekly.
2. Respond to committee requests for rewrite of proposal.
3. Grant proposals should be sent to appropriate funding sources, such as G.S.A., A.A.P.G., Sigma Xi, energy and minerals companies, etc. Students should check on deadlines and fill out the appropriate forms; don't wait until the last minute!
4. Order field maps, aerial photos, and research materials in preparation for the field season.
5. Continue reading relevant articles.
6. Present a first draft of the introduction to your thesis (expanded from your proposal) to your committee. A first draft might include introduction, literature review, and methods. Schedule a committee meeting to review this draft and your summer research plans, techniques, etc.
7. Begin field season. Plan and schedule a field-check meeting with your advisor.

Second Year -Fall Semester

1. Schedule a committee meeting to present an overview of the summer research that you accomplished. Also, prepare a detailed outline of your thesis for approval by the committee.
2. Finish data analysis; prepare preliminary figures, and WRITE. If you don't have a solid draft of your thesis by the end of the fall semester, completion in two years is difficult.
3. Graduate students are strongly urged to submit an abstract of their thesis work to a spring professional

meeting or a suitable alternative organization/meeting as approved by your graduate committee. Abstract deadlines are usually in mid-December.

Second Year -Spring Semester

1. To be on schedule for graduation at the end of spring semester, writing and drafting must be well underway during Christmas break. You are encouraged to draft your figures before you write about them. Writing typically proceeds from A) the approved outline and figures through B) several drafts which the advisor should review and ultimately approve, to C) a revised draft which all the committee members will read and criticize. Your advisor will tell you when your draft is ready to be submitted to the rest of the committee. This committee draft may become the defense copy, or it may need substantial revision before it is defensible. You should remember that the outlines and drafts are blueprints which will change some as writing progresses. After a successful thesis defense, suggested changes should be incorporated into D) the final draft. If you have not prepared a defense ready copy by the middle of spring semester, you probably will not finish your degree in two years. Final revisions, printing, review, and paper work take a lot of time, more time than most students realize.
2. Application for graduation must be done early during Spring semester; check with the graduate college for date and deadlines.
3. Draft of thesis to committee with complete text, figures, and references. Advisor must approve draft prior to distribution to committee.
4. Draft of thesis approved for defense by committee.
5. Place thesis in main office for review by interested parties one week prior to oral presentation.
6. An oral presentation of the thesis will be made to the Department; thesis defense with full committee; defense form signed and filed with Graduate School.
7. The committee-approved final thesis manuscript must be submitted to the Graduate School at least 14 days prior to the end of Spring term.
8. Thesis copies should be distributed to the department and University Library.
9. Maps, samples and thin sections should be packaged for department depository.

MISCELLANEOUS

Can I reduce my Out-of-State fees?

Yes! The best way to eliminate out-of-state fees is to become a Montana state resident. If you have not done so by the beginning of your second year and have a TA, you will no longer be eligible for an out-of-state fee waiver. The general steps required to become a Montana resident include: you should open a bank account, register your car if you have one, obtain Montana drivers license, and register to vote in Montana. There is also some paper work you need to do to change your status. We urge you to go to the registrar's office as soon as you arrive and discuss the procedures so that you do not inadvertently miss a step which will preclude obtaining residency. These actions must be taken before you register for classes in the fall. NOTE: You cannot achieve Montana residency as a full-time student (7 credits or more). You MUST take at least 6 credits to qualify for a T.A. Thus, most students should take EXACTLY 6 credits in each of their first two semesters.

Can I have a desk in the Grad Student Office?

Maybe. Space is limited in the grad student office and is assigned using the following policy:

- #1 *First and second year GTAs**
- #2 *Third year plus GTAs**
- #3 *First and second year RAs**
- #4 *Third year plus RAs**
- #5 *Graduate students not on GTA or RA appointments**

** Top priority is given to those graduate students holding GTA appointments and no distinction is made between masters and doctoral candidates. Should your status in the department change, you may be asked to vacate your cubicle.*

In addition, the following points pertain to the assignment of graduate office spaces within the Department of Earth Sciences (including offices in buildings other than Traphagen that are assigned to ESCI):

- The Department Head is the final authority regarding all office space allocations for graduate students.
- Specific office spaces and/or cubicles for graduate students will be assigned by the Department Head and administrative staff in ESCI.
- Graduate students are expected to keep their office spaces clean and professional looking.
- Office spaces for graduate students are a privilege, not a right.

How do I activate my MSU domain and email account? What other resources are available to me?

Your MSU domain and email accounts can be activated through the Student Account Configuration site or at any of the student computer labs. Lab locations, resources and policies can be found on ITC's "Academic Computing" site and "Student Computer Labs". You should activate your accounts soon after arriving on campus. Use of the MSU email address is preferred over other providers. Contact ITC (x1777) with any problems or questions you may have while configuring your accounts.

Each student account also comes with 5MB of server space for a website. Additional space is available from ITC for a minimal charge. ITC's Web Services Group site will help you get started. You are encouraged to develop a site for your research. A simple site can be easily be created using familiar tools such as Notepad, Word or FrontPage. There are also many freeware and shareware programs available. You may be surprised at how much interest a site can draw to your project. When published, the site may be linked the Department website or your advisor's page.

Many graduate students work on their own personal laptop while on campus. If students wish to connect to the MSU domain, an IP address must be purchased. This is done through ITC's [IP Request Form](#) and the cost is \$50. This charge is the student's responsibility.

SIGNATURE PAGE

I have read this document in its entirety.

Signature: _____

Printed Name: _____

Date: _____

Please return this completed page to the main office by the end of the first week of classes.