

# **GUIDELINES FOR GRADUATE STUDENTS**

**ACADEMIC YEAR 2003-2004**

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*Welcome to the University of Minnesota's Department of Geology and Geophysics. We are happy you have chosen to continue your studies in our department, and we hope that you will have a pleasant and productive experience.*

*This booklet is intended for use as a reference to assist you with the necessary requirements and procedures involved in obtaining an advanced degree. It is designed to describe the Graduate School requirements and to reflect the philosophy of the Department of Geology and Geophysics regarding graduate study. Please read these guidelines and consult them at various stages of your graduate career - for example, when forming committees or getting ready to take an exam. The checklists provided should help you monitor your progress and keep on track.*

*Although much of the information you will need is provided in this booklet, the Graduate School Catalog is a vital reference source because it lists the general requirements for all UofM graduate students. The Graduate School Catalog is available at the Graduate School, 316 Johnston Hall or online at <http://www.grad.umn.edu/catalog/index.html>.*

*You may contact the Director of Graduate Studies at any time if you would like further information.*

## **I. REQUIREMENTS AND PROCEDURES FOR ALL GEOLOGY AND GEOPHYSICS GRADUATE STUDENTS**

### **A. Student Responsibilities/Progress**

Each student must designate a major in one of the two disciplines within the Department: Geology or Geophysics. This choice will influence the course program, the selection of major/minor/supporting field, the composition of examining committees, and the choice of subject matter for Ph.D. written preliminary examinations. A change from one discipline to another requires formal application to the Graduate School.

The Department of Geology and Geophysics expects its graduate students to be self-motivated, conscientious, and professional, and to develop a broad interest in the Earth Sciences by reading current geological journals and attending departmental seminars and professional meetings.

Choice of Advisor: It is a condition for acceptance into the graduate programs that a faculty member agrees to accept a student as advisee. Students may change advisors at any time by obtaining the consent of the new advisor and notifying the old advisor and the Director of Graduate Studies. The Graduate Studies Committee will examine individual cases in the event that an advisor chooses to terminate an advisor-advisee relationship.

Course Program: You and your advisor are responsible for your course program. This program should be arranged in such a way that course work is completed as soon as possible.

Research Work: It is the your responsibility to formulate and focus your own research project(s). This should occur by discussion and mutual agreement with your advisor(s). You should become involved in research as soon as possible after entering the graduate program.

Satisfactory Progress: The term “satisfactory progress” includes, but is not limited to:

- taking and successfully completing the appropriate number of credits, considering other (RA/TA) responsibilities;
- passing courses with satisfactory grades;
- successfully completing the required examinations in a timely manner;
- for non-native English speaking students, satisfying the English competency requirement; and
- making satisfactory progress in research.

Although progress is monitored by the DGS, it is the ultimate responsibility of the student to keep on track.

### **B. Registration**

*ALL* graduate students must register every fall *and* spring semester to maintain their active status. For graduate students who must register solely to meet this Graduate School requirement, a limited-use, free, zero-credit, non-graded registration mechanism has been established - Geo 0999 (see Appendix 4 for department policy).

Before initial registration, you must meet with your advisor to determine which courses you will take. You will also discuss this plan when you and your advisor meet with the Graduate Studies Committee just before the start of Fall Semester 2003. For further details, please refer to section C below.

Graduate students with financial aid must be registered full-time, typically a minimum of 6 credits each semester. You will lose your benefits if you do not register. In addition,

any student whose initial registration is completed after the deadline (for Fall 2003, after Sept 3) will pay a late fee.

After Fall 2003, the University will no longer supply printed copies of the semester Class Schedule. All course information will only be available on-line: <http://onestop.umn.edu/registrar/registration/courses.html>.

The two main ways in which you can register are via the web or in person.

- Web address: <http://onestop.umn.edu/registrar/registration/index.html>.
- In Person (three locations): 200 Frasier Hall (East bank and closest to Pillsbury), 130 West Bank Union Skyway, or 130 Coffey Hall (St. Paul Campus).

When you register, you will be asked about your insurance - be sure to check the appropriate box whether you register via the web or in person. If you are covered by the Graduate Assistant Insurance, check the box for Grad Assistant Health-Care Plan (first year students must apply for this insurance, please see page 20 of this booklet). If you are not covered by the Grad Assistant Health-Care Plan, you must provide your insurance company or HMO and the policy number.

### **C. Coursework Requirements**

You and your advisor will meet with the Graduate Studies Committee just before the start of Fall Semester. This meeting is very important for outlining a plan of courses for the first two years and for discussing any gaps in your Earth Sciences or general background. **Fill in the course planner form provided, and indicate course names, numbers, and credits.** Make sure that your plan satisfies course distribution requirements and total number of credits. You must bring this plan to the student-advisor meeting with the Graduate Studies Committee. This plan is just a draft (you do not have to follow it exactly), but in the fall semester of the your *second* year, the Graduate Studies Committee will again meet with you and your advisor to evaluate your coursework and general progress towards your degree.

In each of these meetings, the Graduate Studies Committee will give advice and directions as needed, to complement advice from your advisor, but it is ultimately your responsibility to fulfill all requirements as specified by the Graduate School and Department.

All students must have *one year each of college calculus, physics, and chemistry*. Those without this background must devise a plan, in consultation with their advisor and the Graduate Studies Committee, to make up these courses.

A field course of other advanced field experience is also required for incoming students. Students who have participated in extended "field" programs involving aspects other than classical geology, such as hydrogeology field practices, oceanographic cruises, or geophysical surveys, may ask the Graduate Studies Committee to consider these in place of the geology field course.

When making your initial course plan, consult course catalogs for the 2003-2004 year, the Graduate Catalogue to determine likely course offerings in 2004-2005, and sections II and III of this booklet for specific information related to the MS and Ph.D. programs respectively.

### **D. Progress Toward Degree**

Normal progress toward the degree entails taking an appropriate number of classes, with satisfactory results, as well as making satisfactory progress in research. A student with a 50% teaching or research commitment will normally take 9 credits each semester. A student with a 25% commitment will normally carry more than 9 credits each semester. A student engaged primarily in thesis research may take fewer formal courses or none at all once credit requirements have been met.

#### **E. Official Degree Program Form**

All students are required to file an Official Degree Program with the Graduate School. The program form is available in 104 PillsH, outside the Graduate School office at 316 Johnston Hall, or online at [http://www.grad.umn.edu/Current\\_Students/forms/index.html](http://www.grad.umn.edu/Current_Students/forms/index.html). On this form, students list all completed and proposed coursework that has been or will be taken in fulfillment of degree requirements, including any graduate-level transfer credits that may be appropriate.

Once the Graduate School approves this program, any changes involve a formal petition through the Graduate School. At the same time, examining committees are also approved: for MS students, this is the final examining committee; for Ph.D. students this is the preliminary oral examining committee (details on committee selection in sections II and III respectively).

**MS students should file the degree program after completing 10 credits and no later than the second semester of registration.**

**Ph.D. students should file the degree program in the first semester of the second year of study, the semester before the Preliminary Written Exam is taken. Ph.D. students entering the program with a Masters should file the degree program by the end of the first semester of study.**

#### **F. Safety Training**

It is required of all personnel working with scientific equipment and chemicals to attend safety training. This year, training is scheduled during the department orientation on August 28, 2003. Students who will be driving a university and/or departmental van for any reason will be required to take driver safety training. This subject will be discussed in more detail at the main safety training.

#### **G. Seminar Attendance**

All graduate students are expected to attend departmental seminars (Thursdays at 3:30 p.m.) on a regular basis as part of their graduate education. Please see Appendix 3, "Departmental Seminar Attendance Requirements for Graduate Students in Geology and Geophysics".

#### **H. Ethics Training**

Training in responsible and ethical behavior when conducting scientific research is required by the Graduate School. This year's session will be part of the department orientation on August 28, 2003.

#### **I. TA Training**

Just before the beginning of each academic year, the University's Center for Teaching and Learning Services provides a Teaching Enrichment Series. Along with New TA orientation, this includes valuable workshops for returning TAs. Although none of these workshops is mandatory, it is recommended that you make use of this valuable resource of information and training. Kent Kirkby holds a special training session for students who will TA the introductory course, Geo 1001.

#### **J. Requesting Change of Status**

Formal application through the Graduate School *and* DGS approval are required if you wish to

- change discipline (geology↔geophysics)
- change from MS to Ph.D. program

- re-enter either program after a lapse in 'active status'

If you have already been accepted into the Ph.D. program and you wish to get an MS degree, it can be done so without having to change to the MS program. You can continue on with your Ph.D. unless there is lapse in 'active status', then formal application for readmission is required.

Change of Status/Readmission Application Form can be obtained at [http://www.grad.umn.edu/Current\\_Students/forms/cos.pd](http://www.grad.umn.edu/Current_Students/forms/cos.pd)

#### **K. Exemptions and Appeals/Grievance Procedures**

All of these guidelines should be considered to have a certain flexibility to accommodate special cases. It is the Department's desire to meet every student's particular situation insofar as possible and to provide guidance through a program best suited to individual needs. If any questions arise in regard to these matters, they should be addressed to the Director of Graduate Studies.

An all-University Student Academic Grievance Policy exists to resolve "complaints brought by students regarding the University's provision of education and academic services affecting their role as students." Copies of the policy and information about its implementation are available from the Grievance Office, 658 Heller Hall, Twin Cities Campus (612-624-1030).

## II. Requirements and Procedures Specific to Masters Students

### A. Credit Hour Requirements

Plan A Masters (with thesis and final oral exam)	<ul style="list-style-type: none"><li>• Total 30 credits minimum consisting of: at least 14 credits in the major field and a minimum of 6 credits in the related field, outside the major. The remaining 10 can be from either inside or outside the major field.</li><li>• Minimum of 10 MS thesis credits are required.</li></ul>
Plan B Masters (project with final exam, either oral or written)	<ul style="list-style-type: none"><li>• Total 30 credits minimum consisting of: at least 14 credits in the major and 8 credits in the supporting program. The remaining 8 can be from either inside or outside the major field.</li></ul>
Plan C Masters (coursework only with emphasis in hydrogeology)	<ul style="list-style-type: none"><li>• Total 30 credits minimum consisting of: at least 14 credits in the major and 9 credits in a minor or supporting field. The remaining 7 can be from either inside or outside the major field. This is a coursework only option with emphasis in hydrogeology and environmental science.</li></ul>

*At least two-thirds of the course work in the major field at the 4xxx level and above must be taken on an A/F basis. And, two-thirds of the total credits must be taken on an A/F basis. For example, Plan A MS requires 10 credits in the major field and 20 of the total credits be taken A/F.*

### B. MS Committee Selection

"The thesis is read by the entire examining committee, which is appointed by the dean of the Graduate School on recommendation of the faculty in the major field **at the time the student's official degree program form is approved.** This examining committee consists of **at least three members: two representatives from the major field and one from the minor or a related field.** Committee members cannot represent more than one field simultaneously (e.g., geology *and* geophysics)."

At least one member of the committee must be a Senior Member of the graduate faculty in the Geology and Geophysics department. All tenured or tenure track faculty in the Twin Cities department are Senior Members.

If you wish to have someone from outside the University on your committee, you need to coordinate this with the Director of Graduate Studies. Well in advance of the examination, the DGS must send a copy of the proposed committee member's resume and a cover letter justifying the request to the Graduate School.

### C. MS Thesis Credits

Plan A MS candidates must enroll for a minimum of 10 Master's thesis credits (Geo 8777) before receiving the degree. These credits are not graded, and therefore cannot be used to meet course credit requirements.

### D. Full-Time Equivalent Credits

Advanced MS students have an option of registering for a one-credit full-time equivalent (Geo 8333). This option is used *only* when an approved degree program is on file and all coursework and thesis credit requirements have been met, yet you need to register to be considered full-time (mainly for financial purposes). This allows you to remain at full

time status and register for only one credit, resulting in a significant cost savings in tuition to whoever pays the tuition. In order to first establish advanced status, you must submit to the Graduate School a Request for Advanced Masters Tracking Flag Form, according to the deadlines: July 15 for fall term; October 15 for spring term, and April 15 for the following summer term (obtainable from the Graduate School web site: [http://www.grad.umn.edu/Current\\_Students/forms/gaflag.pdf](http://www.grad.umn.edu/Current_Students/forms/gaflag.pdf)). After advanced status has been established, then for each term you wish to register for these credits, you must submit to the department an Application for Full-Time Status Registration Form which has been signed by your advisor and the DGS (also obtainable from the Graduate School web site: [http://www.grad.umn.edu/Current\\_Students/forms/fte.pdf](http://www.grad.umn.edu/Current_Students/forms/fte.pdf)).

**E. The Thesis for Plan A MS**

Once your Degree Program has been approved and the thesis is ready to go to the reviewers, request your Graduation Packet from the Graduate School, 316 Johnston Hall. The Thesis Reviewers Report form and Graduation Packet will be issued at that time. **The examining committee must have at least two weeks to review the thesis;** the entire committee must be unanimous in certifying that the thesis is ready for defense as indicated by their signatures on the Thesis Reviewers form. Once this signed form is returned to the Graduate School, you are provided with the final examination report form.

**F. MS Exams**

The only formal examination in the Master's program is the final examination. The Plan A program requires the thesis and the final examination, which consists of the student's oral defense of the thesis. At the option of the examiners, the exam may cover other material relevant to the program. Plan B programs may include either one or two research papers, depending on depth of coverage, and a final exam (either oral or written).

The exam itself consists of a public presentation (30-45 minutes) by the student, followed questions and answers. The remaining question and answer period is closed, attended by only the student and examining committee.

It is the responsibility of the student to assure that all appropriate forms are filed in the Graduate School and all requirements have been met, to schedule the exam when the university is in session (not during summer, winter or spring breaks), and to announce the defense to the department.

**G. Check-out Procedures**

Congratulations, you're done! Well, almost. Before you leave the department, please do the following:

- Hand in a bound copy of your thesis to Kathy Ohler.
- Return all keys.
- Thoroughly clean out your office area and desk.
- You are now an alumnus/alumna! Please, provide Kathy Ohler ([k-ohler@umn.edu](mailto:k-ohler@umn.edu)) with your new contact information, and keep us up-to-date on what you are doing!

### III. Requirements and Procedures Specific to Ph.D. Students

#### A. Coursework Requirements

*Upon entrance into the program, it is expected that all Ph.D. students have two semesters of mathematics or statistics beyond the first year of calculus, and two analytical courses.*

Students may have taken some or all of these required courses before entering the University of Minnesota graduate program and these courses *may* be eligible for transfer and suitable toward fulfillment of this requirement. The appropriateness of equivalencies will be discussed at the first meeting with the Graduate Studies Committee.

In cases where these courses have not yet been taken, students can make-up these deficiencies while here at Minnesota. These courses may or may not count on the official Degree Program, depending upon the level taken (i.e. courses may be taken at the 2xxx or 3xxx level to meet the above requirement but courses on the Degree Program form must be at 4xxx level and up).

Some courses may meet both the math and analytical requirements (e.g., Geostatistics taught through Civil Engineering).

- **MATH/STATISTICS COURSES** may be taken at any level (graduate or undergraduate).

*Examples* of courses that may be used to satisfy the math/statistics course requirement include

Math 4512	Differential Equations with Applications
Math 4242	Applied Linear Algebra
CE 4341	Engineering Geostatistics
STAT 5021	Statistics

- **ANALYTICAL COURSES** must be taken at the graduate level (4xxx and above) and taken outside the Department of Geology and Geophysics. Analytical courses are broadly defined as courses with a strong emphasis in chemistry, physics, or quantitative analysis of Earth systems (materials, fluids, atmospheres).

*Examples* of courses that may be used to satisfy the analytical course requirement include

Chem 5715, 5745	Physical and Advanced Inorganic Chemistry
Chem 8715	Physical Inorganic Chemistry
Chem 8152	Analytical Spectroscopy
CE 4512, 5321, 8352, 8511, 8541	Open Channel Hydraulics, Geomechanics, Groundwater Mechanics I & II, Aquatic Chemistry
Physics 5001, 5002, 5024	Quantum Mechanics I & II, Intro to Electric & Magnetic Fields
BioC 5527	Physical Biochemistry
EEB 5051	Analysis of Populations
MatS 8001, 8002	Structure & Symmetry of Materials, Thermodynamics & Kinetics
AEM 8201, 8202, 8203	Fluid Mechanics
MatS 8005	Dislocations and Interfaces
Geog 5423	Climate Models and Modeling

In general, Computer Science courses do not satisfy either the math/statistics or the analytical requirement.

For the doctoral degree, a minimum of 12 credits must be completed in the minor field or supporting program. The minor field must be declared before the student passes the

preliminary oral examination. For more details, please see page 20 of the 2003-2005 Graduate School Catalog.

**B. Credit Hour Requirements**

Ph.D.	<ul style="list-style-type: none"><li>• Total 36 course credit minimum consisting of: at least 24 course credits in the major field and 12 credits in the minor or supporting field. In some cases, fewer than 24 credits in the major field are acceptable provided the total is at least 36.</li><li>• Up to 40% of the credits (15 credits) can be transferred from other graduate institutions. The transfer is arranged by entering the courses/credits to be transferred onto the Official Degree Program form, which is submitted to the Graduate School for final approval.</li><li>• Although the Graduate School will allow A, B, C, and S grades on a Degree Program, A/F coursework must be completed with an average grade of B.</li><li>• The 36 credits must all be taken at the 4xxx and 5xxx levels, with several formal courses to be included at the 8xxx level.</li><li>• Minimum of 24 thesis credits are required.</li></ul>
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*At least two-thirds of the course work in the major field at the 4xxx level and above must be taken on an A/F basis. And, two-thirds of the total credits must be taken on an A/F basis (for Ph.D.- 16 credits in the major field and 24 of the total credits be taken A/F).*

**C. Pre-Thesis, Thesis, and Full-Time Equivalent Credits**

Doctoral Pre-Thesis credits are available to Ph.D. students who have not yet passed their preliminary oral examination but need to be registered in the Graduate School to meet requirements of agencies or departments outside the Graduate School (e.g. loan agencies). These credits are not graded and therefore cannot be used to meet any Graduate School requirements (Geo 8666).

Ph.D. candidates must enroll for a minimum of 24 thesis credits while writing the doctoral thesis. Students may not register for these credits until the semester *after* they have passed their preliminary oral examination. These credits are not graded therefore cannot be used to meet course credit requirements (Geo 8888).

Advanced Ph.D. students have an option of registering for a one-credit full-time equivalent (Geo 8444). This option is used *only* when an approved degree program is on file, all coursework is completed, and all pre-thesis and thesis credit requirements have been met yet you need to register to be considered full-time (mainly for financial purposes). This allows you to remain at full time status and register for only one credit, resulting in a significant cost savings in tuition to whoever pays the tuition. For each term you wish to register for these credits, you must submit to the department an Application for Full-Time Status Registration Form which has been signed by your advisor and the DGS (obtainable from the Graduate School web site: [http://www.grad.umn.edu/Current\\_Students/forms/fte.pdf](http://www.grad.umn.edu/Current_Students/forms/fte.pdf)).

**D. Preliminary Written Examination**

The written examination as administered by the Department of Geology and Geophysics requires each student to demonstrate breadth of knowledge of work fundamental to their major field of research by writing a document that describes and discusses their primary field of research in the context of the Earth Sciences, broadly defined.

The written examination should **not** explain in detail the methods, preliminary data, and/or expected outcome of the student's research; these aspects of the research should be included as part of the proposal written immediately prior to the oral examination.

### **Timeline**

Incoming students in possession of an MS degree must submit the written examination during Spring Semester of their first year of doctoral studies. Others take the examination in their second Spring Semester. Any request to deviate from this must be presented in the form of a petition to the Director of Graduate Studies no later than the end of Fall Semester of the first year of study.

Before the end of the Fall Semester preceding the written examination, each student will submit names of four faculty examiners to the DGS for approval. Students must meet with their committee at least **two months** before the planned submission date of the examination, and no later than the last week in January.

Students may submit their completed written examination at any time, but **no later than 5 p.m. of the last Monday in March**. Students must submit the written document (5 copies) to Sharon Kressler, who will then distribute the examination to the committee members along with the appropriate grading forms. The reading committee should meet as soon as possible after submission of the written examination, preferably within 2 weeks of the examination submission.

### **Guidelines**

**The examining committee consists of four faculty members from the Graduate Faculty of the Department of Geology and Geophysics (Twin Cities) or the Department of Geological Sciences (Duluth).** (At least one member must be a Senior Member of the Graduate Faculty. All tenured or tenure track faculty in the Twin Cities department are Senior Members.) Two of the four faculty examiners will serve as examiners in the primary subdiscipline. The other two faculty will serve as examiners in two different disciplines of the geosciences considered outside the candidate's Ph.D. thesis research. The student and advisor(s) are responsible for assembling a committee and requesting approval of the proposed committee by the Director of Graduate Studies. It is the student's responsibility to arrange the committee meeting once the DGS has approved said committee.

At the initial meeting with the student, committee members will advise the student on general topics or questions to be addressed in the written examination. These topics will involve the student's primary field of research and other fields of Earth Sciences that relate directly or indirectly to the primary field. At this meeting, the student is responsible for explaining his/her general field(s) of interest in an informal way to the committee; the meeting should not be used for a formal presentation by or questioning of the student.

The written document should be presented as a coherent paper rather than isolated sections of text that address various aspects of the topic independently of each other. The topics discussed should be used to place the research in a disciplinary and interdisciplinary context.

There are no strict limits on length or format (font, font size, margins) of the written examination, but the expected length is in the range of 10-15 pages of typed, double-spaced text. A written examination that is shorter than 10 pages of text will likely be unacceptable. In addition to the text, the document should have a list of references cited and may include figures/tables. Supplementary material can be in any format, including multi-media.

The submitted work must be an original document created by the student without substantive assistance from others. Input from the advisor and committee members may

involve guiding the direction of the topics to be addressed and answering general questions. Students can not submit preliminary drafts prior to the final submission.

### **Evaluation**

Committee members will meet to evaluate the quality of the document and the degree to which the student demonstrates his/her breadth of knowledge of the subjects addressed in the examination. The committee will decide whether the student has passed or failed the examination. If the committee consists of faculty at both the Twin Cities and Duluth campuses, the meeting may take place via conference call or teleconference at the discretion of the committee members.

If the student has done an adequate job in some respects but needs to fix deficiencies in knowledge or other skills tested by the written examination, the committee will specify in writing what steps the student must take to remove these “reservations” and pass the exam. These steps may include taking a class, doing assigned readings, and/or rewriting part of the examination. A specific time must be indicated at which these steps must be completed.

If the written examination does not adequately demonstrate that the student has sufficient knowledge and abilities to pursue a Ph.D. degree, the committee may decide on two options: (1) the student cannot pursue a Ph.D. degree; the option of switching to an MS program can be evaluated in discussion with the student, advisor, and the DGS; (2) the student may retake the exam once, in the semester that follows the first attempt.

It is the responsibility of the advisor to arrange the evaluation meeting and transmit the results to the student and the Department, and the responsibility of the student to ensure that the preliminary written examination report form, signed by the student’s advisor and the Director of Graduate Studies, is received by the Graduate School, 316 Johnston Hall, before scheduling the preliminary oral examination.

## **E. Preliminary Oral Examination**

### **The Committee**

The preliminary oral examining committee includes a minimum of four members: three (including the student's advisor) from the major field and one from the minor field or supporting program. Member names are selected at the time the student submits his/her Degree Program Form. Committee members cannot represent more than one field simultaneously (e.g. geology *and* geophysics).

At least one member of the committee must be a Senior Member of the graduate faculty in the Geology and Geophysics department. All tenured or tenure track faculty in the Twin Cities department are Senior Members.

If you wish to have someone from outside the University on your committee, you need to coordinate this with the Director of Graduate Studies. Well in advance of the examination, the DGS must send a copy of the proposed committee member's resume and a cover letter justifying the request to the Graduate School.

### **Timeline**

The preliminary oral examination is expected to be taken *before the start of the Fall Semester* of the third year (i.e. late Spring semester of the 2<sup>nd</sup> year) following the Written Preliminary Examination.

- One month before the scheduled exam, the student must obtain approval from the Director of Graduate Studies of his/her research proposal.
- Two weeks before the scheduled examination, the student will provide a research proposal to each member of his/her Ph.D. committee. It is also *strongly suggested* that each student distribute a one-page abstract of the research proposal to faculty and graduate students in the Department of Geology and

Geophysics in order to enhance communication and provide a feedback mechanism to the student.

Both the proposal and examination will be judged on the basis of creativity, originality, depth of understanding of the topic, and the student's ability to formulate a problem in the geosciences and to define a logical research strategy aimed at solving this problem.

### **The Proposal**

The proposal will outline the background, methodology, any preliminary results, and anticipated implications of the proposed research. The Department insists that one fundamental trait of the proposal must be originality in ideas and authorship. The format of the proposal should conform to the standard suggested by most funding agencies; for example, NSF's 15-page maximum, single-spaced text, a one-page abstract, figures, and a reference list (a hard-copy example is available from Sharon). In addition, the student will attach to the front of the proposal a one-page resume, an up-to-date Ph.D. Degree Program, and any papers or abstracts published, accepted, or submitted for publication.

### **The Exam**

The student will present his/her research proposal orally for a maximum of 20 minutes, with questions to follow. Although questions may range rather widely, a significant part of the examination will focus on discussion of the student's research proposal. This is a closed examination attended only by the student and the examining committee.

### **Evaluation**

The grading scale is

PASS  
PASS WITH RESERVATION  
FAIL

In a four-member committee, the student must receive at least 3 passing votes in order to pass the examination. A vote of PASS WITH RESERVATION constitutes a passing vote.

If the exam is passed with reservations, the student is informed immediately, but the committee is permitted *one week* in which to convey its reservations to the student in writing, informing the student of the steps that must be taken to remove them. *A copy of this letter must be sent to the Graduate School and should accompany the signed oral examination report form.* When the student has satisfied the committee's reservations, *a second letter informing the student and the Graduate School that the reservations have been removed is required. The final oral examination may not be scheduled until the Graduate School has received a copy of the letter indicating that the reservations have been removed.* (This letter must also be on file in the Graduate School should the student wish to apply for a Doctoral Dissertation Fellowship).

## **E. Thesis Proposal Form**

**No later than the first semester after passing the preliminary oral examination, students must file the Thesis Proposal form with the Graduate School.** The form must include the proposed thesis title and a thesis proposal, about 250 words in length, describing the research to be undertaken and the methods to be employed in carrying it out. Reviewers and committee members are requested at the time this form is submitted to the Graduate School.

### **Thesis Reviewers and Examining Committee**

All members of the final oral examining committee read the thesis, although only those designated as thesis reviewers sign the report form certifying that the thesis is ready for defense.

**Designated thesis reviewers consist of the advisor, representing the major field, and at least two other members of the final oral examining committee, including one**

**representative from the major field and one representative from the minor or supporting program.** Reviewers cannot represent more than one field simultaneously.

**The final oral examining committee must consist of at least four members: three (including the student's advisor) from the major field and one from the minor field or supporting program. The chair of the committee cannot be the student's advisor,** but must be a Senior Member of the graduate faculty from either the major or minor field. All tenured or tenure track faculty in the Twin Cities department are Senior Members.

If you wish to have someone from outside the University on your committee, you need to coordinate this with the Director of Graduate Studies. Well in advance of the examination, the DGS must send a copy of the proposed committee member's resume and a cover letter justifying the request to the Graduate School.

#### **F. The Thesis**

Once the student and advisor are confident that the thesis is ready to defend, the student must obtain the Thesis Reviewers report form from the Graduate School (in person or at <http://www.grad.umn.edu/forms>). This form will not be issued if an approved Thesis Proposal is not on file at the Graduate School.

At the time the student submits a draft of the thesis to the thesis reviewers, copies must also be provided to all other members of the final oral exam committee. The thesis abstract must be included with the thesis when it is distributed to the committee. **The examining committee must have at least two weeks to review the thesis.** The reviewers must be unanimous in certifying that the thesis is ready for defense, whether as presented or with *minor* revisions. If this is the case, and all other requirements have been met, the student submits the completed and signed Thesis Reviewers form to the Graduate School which in turn authorizes the final oral examination. In any instance where revisions are required, the committee must inform the student in writing of the revisions required, and all questions concerning such revisions must be resolved before the final copies of the thesis are submitted and the degree is conferred. *It is the advisor's responsibility to ensure that revisions required by the reviewers are satisfactorily made.*

#### **F. Final Oral Examination (Ph.D. Defense)**

The student must schedule the examination when the university is in session (not during summer, winter or spring breaks) at least one week in advance with both the committee and the Graduate School (refer to Clearance for Graduation on page 24 of the 2003-2005 Graduate School Bulletin). Once cleared to take the exam, the report form for the final oral exam will be forwarded to the chair of the examining committee.

Once scheduled, the student must assure that the defense is advertised in the department. The exam itself consists of a public presentation (30-45 minutes) by the student, followed by questions and answers. The general audience is dismissed and the remaining question and answer period is closed, attended by only the student and examining committee.

#### **G. Check-out Procedures**

Congratulations, you're done! Well, almost. Before you leave the department, please do the following:

- Hand in a bound copy of your thesis to Kathy Ohler.
- Return all keys.
- Thoroughly clean out your office area and desk.
- You are now an alumnus/alumna! Please, provide Kathy Ohler (k-ohler@umn.edu) with your new contact information, and keep us up-to-date on what you are doing!

## **IV. Additional Information for Ph.D. Students Based in Duluth**

The University of Minnesota's Duluth campus does not have a doctoral program, therefore students who wish to pursue a Ph.D. with a faculty member at the Department of Geological Sciences in Duluth must apply to and be admitted through the Twin Cities' Graduate School and Department of Geology and Geophysics. Because the degree is awarded through the TC campus, all students must follow the same requirements and procedures for progress.

Students based in Duluth may experience confusion in certain areas (e.g., registration, financial aid). Many thanks to Isla Castañeda and Kristin Riker-Coleman for their help in straightening out some of these procedures. Isla has composed a "Survival Guide for Twin Cities Students on the Duluth Campus" for both Geology and Geophysics and Water Resources students. Please use this resource in conjunction with these guidelines for all Ph.D. students.

### **A. Coursework, Exams, and General Progress**

All requirements and procedures for progress, including forms, coursework, exams and committee formation are the same for Duluth-based and Twin Cities students, with the following additions/notes

- Students studying in Duluth are required to spend at least one semester of study at the Twin Cities campus. While in residence at the TC campus, students are eligible for a TA appointment. (It is strongly recommended that UMD students reside in the Twin Cities while completing this portion of the requirement).
- The student's examining committees must have at least one Senior Member of the graduate faculty from the TC campus.
- If necessary, the preliminary oral examination can be conducted via teleconference to include the TC member at no expense to the student. This is not the case for the thesis defense, however, as all members of the committee must be present at the defense. As the degree is awarded through the Twin Cities campus, it is required that the final defense be conducted on the TC campus, scheduled when the university is in session (not during summer, winter or spring breaks).
- Many of the forms can be faxed back and forth or sent through the mail for signatures- it is recommended that you keep copies of all submitted forms.

### **B. Financial**

Financial support is the responsibility of the Department of Geological Sciences in Duluth, up to and including tuition, employment, and any summer or travel support. However, Ph.D. students studying in Duluth are eligible for certain Graduate School and other fellowships.

### **C. General** **Important Contacts**

*Twin Cities Campus:*

**Larry Edwards**, Director of Graduate Studies  
edwar001@umn.edu, 612-626-0207

**Sharon Kressler**, Student Support Services Assistant  
kress004@umn.edu, 612-625-5068

**Joan Vindedahl**, Accounts Supervisor  
vinde001@umn.edu, 612-624-2012

*Duluth Campus:*

**Vicki Hansen**, TC/Duluth DGS Liaison  
vhansen@d.umn.edu, 218-726-8385

**Claudia Rock**, Executive Secretary  
crock@d.umn.edu, 218-726-7238

**Registration**

If you are taking classes *in* Duluth, be sure to register through the Duluth one-stop web site as this will assure your use of the UMD recreation center, libraries, and will, hopefully, keep financial aid from getting mixed up (as well as the bonus of smaller student fees). Things get tricky with 'multi-institutional' students, so if you have problems registering, first check Isla's Survival handbook for options, and if that still doesn't help, contact Sharon Kressler.

**UCard**

Students in Duluth can obtain their UCard at 140 Darland Administration Building. Along with access to the libraries and recreation centers, your card allows you to ride any bus in Duluth for free.

**Email**

Because you are admitted through the Twin Cities Graduate School but will register in Duluth, you will likely be issued two email addresses. Although it does not matter which email you use, it would be wise to have one forwarded to the other. But be sure to activate both. The TC email address allows you access to the TC library system. To initiate your email account: <http://www.umn.edu/validate>. To forward your email: <http://www1.umn.edu/adcs/help/fees.html> and click on (in the left hand column) Forwarding and Autoreply.

## V. **Financial Support**

The following applies to Twin Cities based graduate students. The Department normally admits students with guaranteed support. Under rare circumstances, students may be admitted to the programs without financial support. Requirements regarding progress toward the degree are the same for students admitted *without* financial aid as students admitted *with* financial aid.

### A. **Maximum Level of Support**

According to University regulations, financial aid from all University sources combined may not exceed 3/4-time during the academic year. The Department, however, normally does not grant more than 1/2-time support. This includes teaching assistantships, research assistantships, and non-service fellowships. The main exceptions are summer assistantships, night school teaching assistantships, and support primarily from a research assistantship following completion of the Ph.D. preliminary oral examination.

### B. **Time Limits for Support**

For MS candidates, financial support through the Department is normally limited to two years.

For Ph.D. candidates, departmental support will normally be limited to four years, including any support provided while working for an MS degree. For students entering with an MS degree from another institution, the limit is three years.

Ph.D. candidates entering with a Graduate School Fellowship or GAANN Fellowship can expect support by the Department for three years beyond the year of the fellowship.

Support may be extended beyond these limits, but when this is done, it may be at reduced rates. In the case where candidates are supported by research assistantships, the faculty member holding the research grant may, at his/her discretion, extend support beyond these limits.

### C. **Guarantee of Financial Support**

Students who have received written offers of support may expect that support to continue up to the relevant maximum listed above, as long as performance on assigned tasks and progress toward a degree are satisfactory. Support may be terminated if these conditions are not met. Premature termination of support must be discussed by the Graduate Studies Committee.

Students who have not received written offers of support may be hired on a semester-to-semester basis as necessary to carry out the teaching and research functions of the Department.

### D. **Assistantship/Fellowship Opportunities**

#### **Teaching Assistantships**

A teaching assistant helps teach students in a specified course or courses under the general supervision of the academic staff and may be assigned primary responsibility for an entire course. Typically, these positions are half time (20 hours per week) and include full tuition benefits and a health care package. Generally, first year graduate students will TA the lab portion of the introductory geology course (Geo 1001). You will work closely with Kent Kirkby, the Geo 1001 coordinator. Once your registration is complete for a semester, please be sure to notify Kent of your schedule so he may create the lab TA schedule.

After the first year, if you are not assigned to a research assistant position, you will need to notify the Graduate Studies Committee of your need to TA (Dr. Pfannkuch in 2003-

2004). At that time you can request to TA a specific course, but be aware that the greatest need lies with the introductory course.

There are additional policies for International Students. Please refer to section VI of the booklet.

### **Research Assistantships**

Research assistants are paid from the advisor's research grants, and the duties of an RA are determined by mutual agreement with the advisor. In general, the duties coincide with degree research activities. When this is not the case, the RA is expected to spend no more time on his/her duties than does a TA appointed at the same percent time. Prompt, cooperative, and quality job performance is expected. Typically, these positions are half time (20 hours per week) and include full tuition benefits and a health care package.

### **Fellowship Opportunities**

There are numerous fellowship opportunities available through the Graduate School (<http://www.grad.umn.edu/fellowships/index.html>) and the Department (<http://www.geo.umn.edu/dept/programs/Grad-sch.html>). As these are subject to change, it is best to check the respective web sites for updates. Several students have also obtained funding from sources outside the University community (e.g. NSF, NASA).

## **E. Salary and Benefits**

### **Salary/Paychecks**

The Department pays teaching and research assistants the same hourly wage. The salary for those on fellowships will vary according to the fellowship itself. Paychecks are issued bi-weekly and you have the option of picking up your paycheck or having it directly deposited into an account (see Joan in room 108 PillsH).

### **Tuition and Fees**

In addition to a salary, the financial support package includes full tuition benefits. Students must reach the minimum qualification for eligibility and receive a tuition benefit equal to twice the percentage of time worked. For example, a 50% time appointment includes a 100 percent tuition benefit, which applies only to tuition costs. The maximum benefit is 100 percent and applies to a *maximum* of 14 credits each academic term. The minimum number of credits to be considered a full-time student is typically 6 credits but may vary from year to year, so please refer to the Graduate School Catalog for any updates.

The tuition benefit *does not* cover course or student services fees. Students are responsible for paying these fees.

### **Health Insurance**

University-subsidized health insurance is available to most Graduate School students who hold an appointment as a TA, RA or Fellow. For these students, the University pays 50-100 percent of the insurance premium during the academic year (fall through spring), the percentage depending on the level of appointment. To receive this coverage, eligible students must apply for it by the end of the second week of classes. To apply, and for more information, contact the Graduate Assistant Insurance Office, N-323 Boynton Health Service, 612-625-6936.

### **Graduate Assistant Employment Office**

For questions pertaining to your employment as a TA or RA, the Graduate Assistant Employment Office is located at the Donhowe Building; phone is 612-624-7070; web site: [www.umn.edu/ohr/gao](http://www.umn.edu/ohr/gao).

## **F. Summer Support**

New students in the 2003-2004 academic year will receive summer support for either 2003 or 2004. For students in their second year and beyond, there is a limited amount of money allotted from the Department for summer field and/or research expenses. You will be notified in the spring when applications are to be submitted. As these funds are limited, summer support is not guaranteed.

**G. Travel Support**

The Department provides partial support for students traveling to professional meetings to present papers based on thesis research. Upon approval from the DGS, a student may receive up to \$350 in travel monies. Some fellowships (e.g., Doctoral Dissertation Fellowship) have additional funds available for travel and other research-related expenses (see terms of individual fellowship). These resources should be sought first. Applications are available in room 104.

## **VI. International Students**

### **International Student and Scholar Services (ISSS)**

Upon arrival, all international students must go to International Student and Scholar Services (ISSS, 190 Humphrey Center) so they may review immigration documents and schedule a time for the mandatory International Student Orientation Program (ISOP).

ALL international students will be charged an ISSS Administrative Cost Fee of \$50 per semester, \$25 for the summer. This will show on the fee statement and the student is responsible for paying this fee.

### **Language Requirements**

The Department of Geology and Geophysics, in consultation with the Center for Teaching and Learning Services, and in compliance with the requirements of the University of Minnesota, has determined that the following shall be the departmental policy for non-native-English-speaking students entering the graduate program and expecting to be supported financially by the Department at any time during their academic career.

All non-native-English-speaking Teaching Assistants (TAs) must demonstrate proficiency in spoken English appropriate to the demands of their teaching assistantship. This proficiency will be assessed by 1) the SPEAK test (Spoken Proficiency in English Assessment Kit); 2) the TSE (Test of Spoken English); or 3) an English Language Proficiency rating earned through coursework with the Center for Teaching and Learning Services.

### **IT: TALK**

(Institute of Technology Teaching and Language Kickoff)

This intensive summer course is designed for newly arriving Institute of Technology graduate students. The goals of the course are to aid students in their adjustment to life in the US, and to acquaint them with the language and teaching skills necessary for a TA position. An English Language Proficiency Rating will be determined at the conclusion of the course. Those students obtaining a "1" will be cleared for all TA duties and those obtaining a lower score will be recommended for further coursework and/or limited TA duties appropriate to their rating. The IT Dean's Office pays for all expenses relating to the teaching of this course, and in addition provides a modest stipend (typically \$300) to assist these newly entering graduate students with living expenses incurred due to their arrival several weeks prior to the start of the academic year.

### **SPEAK Test**

Levels of proficiency are rated on a 1 to 5 scale. The chart below illustrates the various TA duties appropriate to each level.

- 1 - Eligible for all Teaching Assistant duties.
- 2 - Eligible to hold office hours, tutor, grade, or assist others in a lab without supervision from the Center for Teaching and Learning Services (CTLS). May teach or lead a lab/recitation section if concurrently enrolled in CTLS coursework and receiving supervision from CTLS staff.
- 3 - Eligible for all Teaching Assistant duties if concurrently enrolled in CTLS coursework and receiving supervision from CTLS staff.
- 4 - Eligible to hold office hours, tutor, grade, or assist others in a lab if concurrently enrolled in CTLS coursework. Not eligible to teach or lead a lab/recitation section.
- 5 - Not eligible for any jobs requiring student contact; may not hold office hours, tutor, or assist others in a lab; may not be given any teaching responsibilities.

Recommendation: enroll in CTLS coursework to develop English language proficiency skills.

A minimum recommendation of **3** is necessary to pursue graduate studies in the Department of Geology and Geophysics, *irrespective of the type of appointment (Teaching Assistantship, Research Assistantship, or Fellowship)*. In the event that this minimum grade is not achieved at the conclusion of the pre-academic English training session, the Department will cover the cost of the TA English Program up *to a maximum of two semesters* during the first academic year. If the student has not achieved the minimum performance level required, he/she must enroll a third time without direct departmental assistance until the SPEAK Test has been successfully passed at the 3 level. If this level of English proficiency is not achieved by the end of the first academic year, the Graduate Studies Committee will re-evaluate the student's graduate status.

This requirement of passing the English training program stems from an interest in ensuring that all graduate students in the Department have the language skills necessary to benefit from departmental seminars and satisfactorily communicate during the various written and oral exams taken to fulfill Graduate School and departmental requirements. In addition, it is expected that graduate students should be proficient not only in writing about their academic work but also in presenting their research orally at national and international meetings.

## VII. General Information

### A. Department Contact Names and Responsibilities

During the 2003-2004 academic year, the **Graduate Studies Committee** consists of the following four faculty members, as well as a graduate student elected by the graduate student body at the beginning of fall semester:

**Larry Edwards, Director of Graduate Studies**

208A Pillsbury Hall, 626-0207, [edwar001@umn.edu](mailto:edwar001@umn.edu)

The DGS is responsible for approval of degree programs and all Graduate School forms, and administration of examinations.

**Donna Whitney, Olaf Pfannkuch, David Kohlstedt**

In 2003-2004, TA assignments are the responsibility of O. Pfannkuch.

### Department Staff

**Ms. Kathy Ohler**, Department Administrator

104B Pillsbury Hall, 624-9031, [k-ohler@umn.edu](mailto:k-ohler@umn.edu)

- Office assignments.
- Departmental administrative issues.
- Alumni Relations.
- Keys.

**Ms. Sharon Kressler**, Student Support Services Assistant

104A Pillsbury Hall, 625-5068, [kress004@umn.edu](mailto:kress004@umn.edu)

- Registration information and materials.
- Keys.
- Graduate student progress.
- Travel and summer support applications.
- Seminars.
- General inquiries.

**Ms. Joan Vindedahl**, Accounts Supervisor

108 Pillsbury Hall, 624-2012, [vinde001@umn.edu](mailto:vinde001@umn.edu)

- Payroll issues and paychecks.
- Direct deposit applications.
- Questions on payment to vendors.
- Financial aid.
- Process copier money.

**Mr. Greg Gambeski**, Senior Accountant

108 Pillsbury Hall, 624-3820, [gambe001@umn.edu](mailto:gambe001@umn.edu)

- Travel and supply reimbursement.
- Paychecks.
- Process copier money.
- Purchase Order processing.

**Ms. Karen Swanberg**, Network/Systems Administrator

206 Pillsbury Hall, 624-6541, [swanberg@umn.edu](mailto:swanberg@umn.edu)

- Network and Systems concerns.
- Computer lab.
- Print, copy machine and PC access.

**Mr. Mark Griffith**, Laboratory Machinist

10 Pillsbury Hall, 624-4069, [griff062@umn.edu](mailto:griff062@umn.edu)  
-Machine and Rock shops.  
-Vans.  
-Building maintenance concerns.

**Dr. Kent Kirkby**, Geo 1001 Coordinator  
103 Pillsbury Hall, 624-1392, [kirkby@umn.edu](mailto:kirkby@umn.edu)  
-Coordinates TAs for the introductory geology courses

**B. University ID Card (UCard)**

To obtain a UCard, bring your driver's license, state ID, or passport to the UCard office at Coffman Union. Among other benefits, this card will allow you access to the University library system, the recreation center, and the department's copy machine.

**C. Office Space**

Office space in Pillsbury Hall will be assigned to active graduate students. Please see Appendix 5 for this policy.

**D. Keys**

At the minimum, you will be issued two keys for Pillsbury Hall, one for the outside doors and a "submaster" that allows access to your office, the main offices, and classrooms. There is a cash deposit required for each key: \$10 for the outside door and \$5 for each subsequent key. This deposit will be returned when you return your keys. In the case of lost keys, you lose your deposit and will need to pay another deposit for replacement keys. Our office is also authorized to issue keys for Kolthoff Hall, but keys for any other building (e.g., Shepherd Labs) need to be obtained from someone at that location.

**E. E-mail, Mailbox and Notices**

You will receive a University e-mail address, which you must activate via the web at <http://www.umn.edu/validate>. This mailing list is the primary means of communication within the department.

You will be assigned a mailbox in room 108 Pillsbury Hall, where you will receive any mail or intercampus notices. If you will be TAing a course, please be sure to tell people that the mailboxes are in room 108.

**F. General Office (copies, fax, supplies)**

**Copier**

The copier located in room 108 is for departmental use, not the general University populace. In order to use this machine, you must contact Karen Swanberg to activate the use of your UCard and contact either Joan or Greg to process money into your account.

**Fax Machine**

There is a fax machine in room 104 Pillsbury Hall. Use of this machine is free of charge, however we ask that you keep personal faxes to a minimum. Should you do any long distance or overseas calling, you will need either a UPAC (University Personal Access Code) number if it is business and can be charged to an account (your advisor will provide you with this) or your own calling card if it is personal.

**Supplies**

The supplies in room 108 are available for teaching use only. Personal supplies can be purchased at the bookstore in Coffman Union.

**G. Security**

During the week, Pillsbury Hall is unlocked around 7 a.m., locked up around 9-10 p.m., and is locked all weekend. As this is a public building, people are free to walk in and out

at will. We have had some thefts in the past (bikes, computers, wallets), so please be aware of this and keep your belongings secure, and office doors shut and locked when not occupied. **Do not leave the doors to Pillsbury Hall propped open at night or on the weekends for any reason.** If you work in the department at night or on weekends, you may contact an escort service to walk you to your car or the bus at 624-WALK (9255).

#### **H. Phones**

Each of the grad office areas (100 and 200 wings, room 125A) is equipped with a common phone. Campus and local phone calls are free of charge, however, as with the fax machine for long distance and overseas calls you, will need either a UPAC number for business or your own calling card if it is personal. As these phones are common to several students, please be respectful and courteous in their use and in taking messages for others.

#### **I. Computer Lab**

The Computer Lab in 206 Pillsbury is designed for the use of undergraduate and graduate students taking classes in or relating to the Department of Geology and Geophysics, and for the use of researchers, staff, and faculty related to the Department.

In order to use the lab, you must obtain the key code from either Karen Swanberg, (swanberg@umn.edu, x6-6541) or the front office (Rm. 104), and sign an Acceptable Use Policy to insure that you are aware of what is acceptable and unacceptable use of the 206 lab. You also need to be aware of the rules governing all use of computer facilities related to the University. In addition, you must see Karen for in order to print to the printers in the lab, use a PC, or use the copy machine.

#### **J. The Rock Shop**

The rock shop (10 PillsH) is available for your use and is normally open during the weekdays. Should you need a key, you will need to obtain this from Mark Griffith in room 8. As the rock shop is a common area, it is vital that the room be kept clean. Please report any equipment malfunctions or needed repairs to Mark.

Anyone planning to use the saws, thin section machine, or rock crushing equipment must attend a training session, even if you have previous experience with this type of equipment. In 2003-2004, training will be conducted by Dr. Annia Fayon at the beginning of the semester.