

University of Vermont
Geology Department
Graduate Student Handbook
2018

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1.0 INTRODUCTION

Graduate school is a difficult but potentially rewarding period of any scientist's life. Getting an MS degree should be an intellectually stimulating and demanding experience. As faculty and advisors, it is our goal to graduate capable, proud and employable scientists.

This document presents the process by which students will attain a graduate degree in Geology at UVM. It outlines the steps students will take to complete the MS program and our expectations. The purpose of this document is to facilitate efficient progress through the program and to elaborate on important policies. In order to smooth the transition to graduate school and make progress through the program as productive and enjoyable as possible, the department faculty teach a one-credit course for first year graduate student entitled "Introduction to Graduate Studies in Geology." All first year students are expected to register for this course during the spring semester of their first year at UVM.

It is imperative that you consult this document in conjunction with Graduate College policies and procedures outlined by the Graduate College; please see the Graduate Catalogue and links for current students at <http://www.uvm.edu/~gradcoll/>. The Graduate School sets official University-wide policy, and policies of the Graduate College supersede those of the Department where there is conflict; this handbook lays out policies of the Geology Department. Exceptions to guidelines presented in this handbook may be requested by petitioning the Department faculty.

For general information relating to graduate studies and UVM graduate school policies it is best to contact:

The Graduate College Dean's Office
The University of Vermont
330 Waterman Building
Burlington, Vermont 05405
(802) 656-3160
<http://www.uvm.edu/~gradcoll/>

2.0 GRADUATE PROGRAMS IN GEOLOGY

2.1 Scope and Objectives of the Program

The Department of Geology at the University of Vermont offers the Master of Science (MS) degree. Students in the MS program will: 1) pursue advanced study and original research in one or more areas of geology, 2) eliminate deficiencies in their geological education, and, 3) prepare for employment in the geological sciences, science teaching, enrollment in a doctoral program, or employment in any other scientific field. Although MS students work toward a high level of proficiency in a chosen field of specialization, they should also acquire a broad understanding of the fundamentals of geology. Incoming MS students should select a research topic by the end of their first semester of course work. Incoming graduate students may find it helpful to sample a variety of graduate courses and to seek the advice of several faculty members during their first semester as they select a thesis topic, address deficiencies in their geologic preparation, and refine their academic and research plan.

2.2 Overview of the Master of Science in Geology Degree

The Master of Science in Geology is a rigorous research program with grounding in related coursework. Both thesis and non-thesis options are available; however, the thesis research is the emphasis of the Geology graduate program and applicants for the thesis option receive preference for available positions. Research programs include environmental geology, geomorphology, water resources, microbial geochemistry, mineralogy, sedimentary, igneous and metamorphic environments, geochronology, and structural evolution of orogenic belts. Examples of specific faculty interests include geologic history and recent sedimentation in the Lake Champlain Basin, processes and chronology of glaciation, stable, radiogenic, and cosmogenic isotopic studies, water quality and pollutant transport, crystal chemistry and crystallography, geochemical cycling, tectonic evolution of deformed continental margins and interiors, petrofabric and structural analysis of deformed rocks, partial melting processes, mineral structure analysis, stratigraphy and sedimentary environments of lower Paleozoic sandstones and carbonates.

2.2.1 Prerequisites for Acceptance to Candidacy

1. Bachelor's degree in Geology or related field from an accredited institution with yearlong courses in chemistry, physics, biology, and mathematics preferred. The MS program is also open to undergraduate majors in physics, chemistry, biology, engineering or mathematics who have accumulated 12 semester hours of coursework in geology. Required remedial course-work in geology, if any, will be established by the student and the faculty during the admission process and during advising at the beginning of the first semester.
2. Strong undergraduate record, letters of recommendation, and satisfactory GRE scores.
3. Applicants should identify a potential faculty advisor (or advisors) and include research interests in the application statement.
4. Application to the program is a competitive process and admission is dependent upon available Teaching and/or Research Assistantships.

2.2.2 Minimum Degree Requirements

For the MS thesis option, research credits and advanced courses in Geology must total at least 30 semester hours including a minimum of six and a maximum of nine credit hours for thesis research (GEOL 391). A minimum of 15 graded credits used in compilation of the graduate GPA must be taken in residence at UVM. Thesis credit is included as part of the 30-hour minimum. With the prior approval of the Department and the Graduate College, students may apply one 100 level (not including 200 level courses approved for graduate credit), three-credit undergraduate course towards their graduate program. A student's advisor must petition the Graduate College for approval before the student enrolls in the course. Under no circumstances will a course numbered below 100 be applicable to a master's program. Students must also pass the two-part Comprehensive Examination as explained in subsequent sections of this document.

Students accepted into the program under the thesis option cannot switch to the non-thesis option without prior approval from the thesis committee. Degree requirements for the non-thesis option are as above with the exception that only three to six credits hours are required

for research. At the time of enrollment the student must select a general area in which to write a research report. The report is the culmination of independent study and must be the result of an extensive literature search, fieldwork, laboratory work, or similar effort. The report must follow the general guidelines for writing a thesis as outlined in this document and is subject to the thesis committee's approval.

Advanced courses in related sciences are encouraged and may be substituted for Geology courses with the permission of the student's thesis committee. All students are encouraged to successfully complete a course in field geology or equivalent before graduation. This can be satisfied by Geology 217, 201, a comparable course at another institution, or recognized experience with a state survey, U.S. Geological Survey, an oceanographic/limnological institute, or industry. Satisfactory completion will be determined by the student's thesis committee. Students must pass both parts one and two of the Comprehensive Examination as outlined below.

3.0 GENERAL REGULATIONS

3.1 Grades Required for Graduation

Letter grades are used to indicate levels of performance in courses as follows: A, excellent; B, good; C, fair; D, Poor; F, failure. Designations of S, satisfactory and U, unsatisfactory, are used to indicate levels of performance for credits received in Thesis Research and may be used to indicate levels of performance in Seminars.

A candidate for a graduate degree must complete his/her program with a minimum overall quality point average of 3.0. In determining a quality point average, 4 points are allowed for each credit hour graded A, 3 points for each credit hour graded B, 2 points for each credit hour graded C, 1 point for each credit hour graded D, and 0 points for each credit hour graded F. A failed course may be repeated only once; only the second grade is considered if the course is repeated. A student may be dismissed from the Graduate College if she/he receives more than two grades below a B, or if he/she receives the designation of U in Thesis Research.

The designation "INC" is used to indicate course work that is incomplete for a reason approved by the Dean; the course must be completed within a time specified by the department and the Dean. The designations SP and UP are for courses with a linkage in credits to multiple semesters. Neither SP nor UP will be included in the student's GPA. The grade of SP will be assigned when a student has made satisfactory progress during a semester prior to the final semester of the linked courses; credit will be awarded with the grade of SP. The grade of UP will be assigned when the student's progress has been unsatisfactory and no credit will be awarded. Both SP and UP are final grades and can remain on the transcript. If desired, they may be changed according to the following: SP may be changed to a letter grade once the final grade for the multiple semester work is completed; a grade of SP cannot be changed to a UP or F based on not completing the final semester's work unsatisfactorily. UP may be changed to an F.

Graduate students may elect to take an undergraduate course on a pass-fail basis provided that 1) they receive prior permission from the Department Chair and the Dean of the Graduate College and 2) the grade will not be used in any type of evaluation. Courses for graduate credit may not be taken on a pass-fail basis. A form should be completed by the

student's advisor and the instructor prior to taking the course. Forms are available from the Graduate College office website: http://www.uvm.edu/~rgweb/?Page=forms/f_forms.html.

3.2 Maximum Time Limits for Degree Completion

Full-time student	3 years
Part time student	5 years
Summers only	7 years

These time limits apply both to study at the University of Vermont and to courses presented for transfer of credit. If a graduate student moves to part-time status after two years of full-time status, he/she is considered a part-time student.

It is absolutely essential that graduate students work with their advisor to develop a thesis topic and research plan that can be completed in four to five semesters. We encourage this progress because: department funding is typically limited to four semesters, rapid progress through graduate school is a trait looked favorably upon by employers, demand for advising time is significant, and department admissions are limited by the time it takes for currently enrolled students to complete the program.

3.2.1 Definition of full and part-time student

A handy summary of Graduate College regulations regarding enrollment can be found at: <http://catalogue.uvm.edu/graduate/academicenrollment/enrollmentpolicies/>.

Nine credit hours define a full time graduate student and five credit hours define a half time graduate student. Funded students on a full-time assistantship (20 hours/week) must be registered full-time in the fall and spring semesters. Full-time assistants receive a scholarship that pays the tuition for the 9 credits required for full-time status. Half-time assistants (10 hours/week) must be registered for at least 5 credits in the fall and spring semesters. While 5 credits gets a student to half-time status, half-time assistants are granted scholarships that will cover the cost of up to 6 credits of tuition. International Students are still required to maintain a full course of study to comply with immigration regulations. Under these definitions of full-time/part-time, international graduate students with and without assistantships will be required to register for nine credit hours in the fall and spring semesters to be considered full-time.

The definitions of Full Time and Part Time apply to Continuous Registration as well (see below regarding GRAD 901, 902 and 903). As the Student Health Center Fee is required for full time students, this fee is required at nine credits for graduate students and is automatically included in the Comprehensive Fee for nine credits. Graduate students are required to have health insurance at nine credits, and are eligible to purchase the UVM student health insurance at five credits. These definitions apply to summer enrollment as well as the academic year. However, regulations and policies around financial aid for summer enrollment are complex and students should consult Student Financial Services with specific questions.

3.2.2 Continuous Graduate Registration

Students who are actively working toward their degree completion and have completed all credits required for the degree, but have not completed all graduation requirements, must enroll each semester for Continuous Registration and pay a Continuous Registration fee each semester until all degree requirements are completed, including removing incomplete grades,

passing the comprehensive examination, or completing a thesis or dissertation. Students who are working at the full time level of nine or more credit equivalency register for GRAD 903 in their discipline, pay a Continuous Registration fee, and must pay the Health Center Fee required of full time students. Students working at less than full time, but at least half time level (five to eight credit equivalency) register for GRAD 902 in their discipline, pay a Continuous Registration fee, and must pay the Health Center Fee if they elect to purchase the UVM health insurance. Students working at less than half time (one quarter to 4 credit equivalency) register for GRAD 901 in their discipline and pay a Continuous Registration Fee. Details are available at:

https://www.uvm.edu/academics/catalogue2012-13/?Page=allpolicies.php&SM=policymenu.html&category=graduate_policies&policy=Continuous%20Graduate%20Registration/.

3.3 Residence Requirements

Candidates for the master's degree must satisfactorily complete twenty-one credits in residence. The residency requirement is completed by courses that (1) are taken for graduate credit through the University of Vermont, and (2) are taken after the student has been admitted to the Graduate College. If the student has interrupted graduate studies more than one year or failed to return from an approved leave of absence for more than one year, Department permission for readmission will be necessary as outlined in the Graduate Catalogue.

4.0 THESIS REQUIREMENTS FOR THE MS DEGREE

4.1 General Policy

Independent research will be a significant part of the training of every graduate student in the MS program. The results of this research will be presented in the form of a thesis. The term thesis shall mean an organized and original work, submitted in partial fulfillment of the requirements for the Master of Science degree. Graduate students will be advised and encouraged to prepare and submit their research work for publication, either during term of residence or as soon as practical after completing their thesis. Graduate students will be expected to attain a standard of excellence in research and in the presentation of their thesis that is acceptable by scientific journals. In fact, the option exists for students to prepare their thesis in part as a paper for publication. This and other options are elaborated upon in “Guidelines for Writing & Defending Thesis/Dissertation” available from the Graduate College website. Each graduate student should obtain and read this guidebook along with other information on deadlines and policies related to thesis requirements from the Graduate College.

4.2 Graduate Advising

The Masters of Science in Geology at UVM is a rigorous research thesis program with grounding in related coursework. Because the program is thesis oriented, graduates students are accepted for study at UVM in association with a specific MS thesis advisor or advisors. If the student and advisor(s) do not develop a mutually acceptable thesis project during the first

semester, the student and advisor(s) may wish to identify another advisor with whom the student can work. Upon arrival at UVM, entering graduate students will meet with their advisor(s) to assess deficiencies and plan the first semester's work. Subsequent course choices should be made in consultation with the student's thesis committee.

4.3 The Thesis Committee

The thesis committee is an important component of a graduate education and is composed of at least two Geology faculty and at least one faculty member from outside the department to serve as the committee chairperson. At least two faculty must be members of the Graduate College, including the chairperson. Outside committee members can bring valuable insight and talents to the student's committee and project. There is no maximum number of committee members; however, large committees can be unwieldy. During the first semester, the student and advisor will work together to establish at least a three-person thesis committee. **SUCH A COMMITTEE MUST BE ESTABLISHED BEFORE THE COMPREHENSIVE EXAM PART 1 IS TAKEN.** It is the purpose of the committee to provide guidance, context, and a variety of opinions. Your advisor will help you select faculty for your committee, but it is the responsibility of the graduate student to communicate with these faculty, formally invite them to participate as members of the committee, and schedule the time and location of comprehensive exams and committee meetings.

The thesis committee will review all documents (thesis proposal and progress report) before they are presented to the full department. This is both to assure that the documents are of the highest quality and to prevent unpleasant surprises during and after public presentations. Expect that during the comprehensive exams, committee members and other member of the faculty will ask probing and difficult questions about research methods, data, and interpretations. The goal of such questions is to determine what weaknesses and how to strengthen these weaknesses. Committee members should be viewed as an academic resource rather than as a hindrance to progress. The committee can help develop a reasonable and achievable timetable for completion of thesis research.

4.4 Written Thesis Proposal

The written proposal is presented to the Department in the second semester (typically the spring semester) and should demonstrate the feasibility and importance of the thesis research project to a scientifically literate audience. The proposal must discuss the research objectives and their significance to the advancement of geologic knowledge. The proposal must clearly lay out the hypothesis or hypotheses to be tested and should include a work plan of detail sufficient to demonstrate that the project can feasibly be accomplished in the time frame and with the financial resources available. The purpose of the written proposal is to ensure that the thesis research is focused and achievable within a two-year time frame. The written proposal should be a stand-alone document of the highest quality. It is the graduate student's first scientific introduction to the faculty and will set the tone for future interactions. Students should be prepared for critical review and editing the thesis proposal by the committee. It is their goal that only the best and most defensible document be available for public consumption.

The proposal (excluding cover sheet) must contain no more than 15 numbered pages of left-justified, double spaced text (font: Time New Roman, 12 point font, margins 1.5" left, 1" top, bottom and right) including tables and figures, but excluding references. Tables and figures may be included in text or precede the bibliography. Page numbers must be centered above the bottom margin. Single copies of up to three large maps or stratigraphic sections may be included as plates and displayed in the room where the proposal is to be given rather than attached to the proposal. A sample outline of the proposal is included in Appendix V.

One copy of your proposal should be submitted to the faculty as a PDF document no later than seven days prior to the scheduled oral proposal defense. This draft must be approved by your committee prior to submission. The schedule for oral presentations will be posted by March 15th. Oral presentations and comprehensive exams (part 1) will take place in April and May. Efforts should be made to schedule the exam on Monday afternoons at 4:15 p.m.

4.5 Oral Proposal and Comprehensive Examination (Part 1)

The oral proposal to faculty, staff, students and other interested parties should communicate in a concise but detailed fashion, the information contained in the written proposal. It should provide the audience with background sufficient to evaluate the importance of the work and the feasibility of the project. The talk can be no longer than 30 minutes and should be well-illustrated with MS PowerPoint slides, maps or transparencies.

The oral proposal is the graduate student's first public presentation and should be of the highest quality. The purpose of this presentation is to introduce the department to the student's thesis research and for students to receive feedback from others. The oral proposal should be well rehearsed and its content should not come as a surprise to the committee. Students should expect to receive public questioning regarding the content and feasibility of the proposed research for 10–15 minutes after which the public will be asked to leave and the faculty will continue the questioning. Faculty questioning typically lasts for 60–90 minutes and may address the assumptions, methodology, and the relationship of the proposed work to and its dependence on auxiliary sciences. Bear in mind that this questioning constitutes part 1 of a University-mandated Comprehensive Examination, which all graduate students must pass. This session is designed to 1) evaluate the scientific validity of the proposal; 2) evaluate the student's capability to successfully complete the research; and 3) advise the student on subsequent course selection and offer constructive criticism on the research approach.

It is the faculty's expectation that our graduate students should be sufficiently well-rounded that they can make a well-reasoned attempt to answer any geologic question. Students should expect tough questioning and should not be surprised if pushed to the limit of their knowledge. At the conclusion of the questioning session students will be asked to leave the room. The faculty as a whole (considering the recommendation of the committee) will evaluate 1) the feasibility of the proposed research, 2) the quality of the presentation, and 3) the ability to answer the questions posed. Students will pass Part 1 of the Comprehensive Examination if the committee and faculty feel these three requirements have been met. Alternatively, if the outcome of the Part I Comprehensive Exam is not successful, students will receive a written letter from the thesis advisor or committee chairperson outlining the conclusions of the faculty. The committee and faculty may allow the student to rewrite the proposal to address these concerns identified and/or present a revised talk to the Department. A copy of this communication will reside in the student's Department file.

The thesis proposal will become a part of the student's record. Final approval of the proposal will be made by the student's Thesis Committee in consultation with the other departmental faculty not on the thesis committee, on the basis of the presentation and oral defense.

4.6 Written Progress Report

The written progress report is presented to the Department in the third semester (typically the fall semester) and should present the progress made since the proposal presentation. Realize that the progress report is NOT meant to be a completed work. Faculty expect that progress reports will differ dramatically in their content and style. What is important is that the progress report demonstrates to the committee, to the Department, and to the Graduate College that you are making continual and sufficient progress toward the MS degree by conducting high-quality research—a prerequisite for continued graduate standing and department funding. We expect that the progress report will summarize and present the data collected to date and offer initial interpretations. It must include a detailed work plan for the completion of the thesis research and defense of the thesis. The progress report should also list in detail changes in the research plan, which may have occurred since preparation of the proposal.

The progress report (excluding cover sheet) must contain no more than twelve numbered pages of left-justified, double-spaced text (font: Time New Roman, 12 point font, margins 1.5” left, 1” top, bottom and right) including tables and figures, but excluding references. Tables and figures may be included in text or precede the bibliography. Page numbers must be centered above the bottom margin. A sample outline of the progress report is included in Appendix V. It is appropriate for a progress report to reference information in the thesis proposal rather than restate the proposal in its entirety; a progress report should summarize work to date and demonstrate that the first steps toward writing the thesis have been taken.

A PDF file of the progress report should be distributed to the faculty no later than 7 days prior to the scheduled oral progress report. A schedule for oral presentations will be posted by October 15th. Oral presentations and comprehensive exams will typically take place in November.

4.7 Oral Progress Report and Comprehensive Examination (Part 2)

The oral progress report should communicate in a concise but detailed fashion, the information contained in the written progress report. It should provide the audience with background sufficient to place the data presented in context so that a listener can understand its importance. The talk should present the data collected, initial interpretations, and detailed work plan to complete the thesis. The work plan should consider any additional data to be collected and a timetable for completion of the thesis. The presentation must be no longer than 30 minutes and should be well illustrated.

The oral progress report brings the department up-to-date on the latest research findings and demonstrates to the department that sufficient progress toward the MS degree. The format is similar to that used for the proposal presentation. Faculty questioning will typically be

focused on the data presented, interpretations, and work plan to complete the thesis. The progress report is part 2 of the Graduate College Comprehensive Examination. Students should expect tough questioning and should not be surprised if the validity of interpretations is challenged. Students should be able to offer data or a rationale by which to defend their interpretations. At the conclusion of the questioning session, the student will again be asked to leave the room. The faculty as a whole (considering the recommendation of the thesis committee) will evaluate the data presented, the defense of interpretations, the quality of the presentation, the amount of progress made toward the MS degree, and the ability to answer the questions posed. Part 2 of the Comprehensive Examination is passed if the faculty determines these requirements have been met. If one or more of these requirements have not been met satisfactorily, the comprehensive exam is not passed and the faculty will propose specific remedies.

The faculty realizes that, for varied reasons, not all students will be able to present the same level of "hard data" pertaining to the solution of their thesis problem. The presentation is indeed a progress report, intended to assure adequate progress and a clear sense of direction. Upon successful completion of the progress report, as determined by the student's thesis committee in consultation with the Geology Department faculty, the Comprehensive Examination requirement will be satisfactorily passed. Alternatively, if the outcome of the Part 2 of the Comprehensive Exam is not successful, you will receive a written letter from your thesis advisor outlining the conclusions of the faculty. In the event the exam is not passed, the student might be allowed to rewrite the progress report to address these concerns or be asked to present a revised talk to the Department. A copy of this communication will reside in the student's department file.

4.8 Defense of Thesis

Defense of the M.S. thesis may be scheduled only after the candidate has passed the Comprehensive Examination and has demonstrated sufficient progress towards completion of a draft of the thesis. It is the responsibility of the student to obtain guidelines for thesis format and deadlines from the Graduate College (these documents and information on deadlines are available from the Graduate College website). Upon completion of a draft of the thesis that has been accepted by the student's graduate advisor, the student will present copies to other members of his/her thesis committee. *In accordance with Graduate College regulations, these copies must be distributed at least two weeks prior to the scheduled defense.* If any committee member receives a complete thesis copy less than two weeks before a scheduled defense, they may ask for the defense to be postponed. Following the defense, the student has six weeks after the defense to submit hard copies of the revised and approved thesis.

The oral defense of the thesis will be scheduled with both the Department and the Graduate College no less than two weeks following the advisor's approval of the draft. The thesis defense is open to the public and the examination will cover material concerning or pertaining to the student's research. This oral presentation should be about 40 minutes in length and will be followed by questions from the floor, and then questions from the student's thesis committee, with the student's outside member of the thesis committee serving as chair of the defense. The result of the thesis defense will be determined by the student's committee. Results may be recorded as follows:

1. Pass with minor or no revisions necessary and immediate preparation of the final draft recommended.
2. Pass with substantial revision, which must be approved by the student's committee prior to preparation of the final draft.
3. Fail, requiring major revisions of the thesis and another scheduled Defense of Thesis.
4. Fail, requiring withdrawal from the program.

Upon completion and approval of the final draft, the thesis must be signed by all members of the student's committee and submitted to the Graduate College. Normally this must be done at least two weeks before the date of commencement. An electronic copy of the thesis and accompanying maps and figures must be left with the student's advisor.

4.9 Research Materials

The Department is responsible for ensuring that research done under its auspices can be reviewed and utilized by other scientists both within and outside of the department. Because of this, materials (rocks, fossils, thin sections, air photos, stratigraphic sections, raw data, etc.) used for the preparation of departmental theses must be accessible to the Geology Department even after students who prepared these materials have graduated. Typically, this requirement is fulfilled by leaving with the faculty advisor a suite of samples cited in the thesis such as thin sections, rocks, or rock powders. In addition, it is appropriate to leave with the faculty member copies of critical field notes, field maps, or raw analytic data when interpretation of material contained in the thesis requires that these primary sources be consulted. These materials will be catalogued and will become part of the departmental collections. The graduate student must either catalogue these materials or participate in their cataloguing while he/she is still in residence here. These catalogued materials may be loaned to a former graduate student or to other qualified persons who wish to carry out further research on these materials at other institutions.

If the materials or equipment were paid for by departmental funds, faculty grants or grants given to the student (AAPG, GSA, VGS, Sigma Xi) as part of completing a thesis, the materials will typically remain in the Department unless the faculty advisor gives explicit permission for materials to leave with the student. If the student paid for research materials such as air photos or thin sections out of his or her own pocket, then arrangements should be made with the supervising faculty member or department chair to duplicate pertinent materials in such a way that the important data can be retained by the Department.

Research undertaken with the support of a grant or other external funds awarded to UVM for a program directed by the student's graduate advisor carries additional conditions. In the event that the student must withdraw from the graduate program or from the research project, all of his/her preliminary materials, including maps, field notes, and laboratory results, remain the property of the institution to which the grant was issued. These materials may be available for future loan to the student upon approval of his/her former research advisor.

To ensure that all materials are properly archived and all departmental material is returned, a checklist is provided in Appendix V that must be completed and approved by the Thesis Advisor before final approval of the degree.

4.10 Authorship and Data Ownership

The question of authorship of papers and abstracts resulting from research pursued cooperatively between students and faculty should be discussed explicitly by the student and her or his advisor at the beginning of the project to prevent later misunderstandings. Advisors differ in their policies regarding inclusion on student-authored abstracts. In every case, a person whose name is included on an abstract or paper must be consulted before submission of the document. The best approach to authorship is open discussion before and during paper and abstract preparation.

5.0 SUMMARY OF REQUIREMENTS FOR THE GEOLOGY MS DEGREE

Students who have completed the minimum requirements outlined below will be recommended as candidates for the Degree of Master of Science to the Graduate College. These requirements are not necessarily listed in order of fulfillment.

The MS degree candidate must have:

1. Satisfied any and all remedial undergraduate course work recommended upon his/her entrance into the program.
2. Completed an approved program of at least 30 credit hours of advanced courses in Geology, including the GEOL 302 "Introduction to Graduate Studies", including a minimum of six credit hours of Thesis Research (GEOL 391). No credit is allowed for courses in which a grade less than "C" has been recorded.
3. Maintained at least a "B" (3.0) average in course work counted for graduate credit.
4. Selected a thesis topic and submitted an approved proposal of the thesis.
5. Given satisfactory evidence that he/she has general understanding of the fundamental principles and problems in geology relating to his/her thesis research by successfully passing the Comprehensive Examination (Parts 1 and 2) and prepared an acceptable thesis.
6. Submitted and successfully defended an oral examination and approved thesis, and submitted electronic copy of thesis to advisor.

It is recommended that every graduate student obtain documents available online from the Graduate College regarding the preparation of the thesis, deadlines that must be met, and actions that must be taken regarding completion of the thesis.

6.0 TEACHING ASSISTANTSHIPS

6.1 General Information

Teaching assistantships are awarded to both incoming and second year graduate students each academic year (See Appendix IV for additional information). Although incoming

students are typically awarded two years of support, satisfactory academic and teaching performance are required for renewal of the assistantship for the second year. Students are not typically awarded a teaching assistantship during their third year. The Graduate College assumes a time commitment of 20 hours per week for a full-time teaching assistant. Teaching responsibilities usually include five introductory physical geology laboratory sections each academic year. Assistants assigned to upper level classes may teach fewer sections.

6.2 Assistantship Appointments

Because the University funds assigned to stipends are limited, Graduate Teaching Assistantships are awarded on a competitive basis. Applicants with stronger recommendations, academic records, and basic GRE scores are normally given preference in selection of candidates.

6.3 Tuition Remission

A graduate student holding a full Graduate Teaching Assistantship is awarded up to 9 credit hours tuition remission per semester. A graduate student holding an assistantship for two semesters of the academic year has a maximum of 18 credit hours of tuition remission for the entire year. Tuition remission does not relieve the student of payment of the various other University fees and charges. There is no restriction on credit hours and they may be used for courses, research, and/or continuous registration.

6.4 Course Workload

The maximum number of graduate credit hours to be carried by a Graduate Teaching Assistant during one semester is 12 credit hours. Graduate Teaching Assistants must register for a minimum of six credit hours during every semester in which the Assistantship is held. Two courses per semester during the first year and one course per semester during the second year, plus thesis research, are typical loads. Exceptions may be made for those students who have completed their residence requirements.

6.5 Fulfillment of Teaching Obligations

Graduate Teaching Assistants are expected to fulfill their assigned assistantship obligations in a competent and professional manner. Assistants are advised to keep their supervisors informed of the progress of their duties and of attendant problems. Students not performing their teaching duties satisfactorily will be warned initially, and if no improvement is observed afterwards, their appointment will be reviewed by the Department, and the teaching assistantship may be terminated.

6.6 Maintaining Academic Standing

Graduate students are expected to maintain a minimum grade point average of 3.0 on their graduate course work (200- and 300-level courses) during their tenure as Graduate Teaching Assistants. Students falling below this average may be placed on one semester's probation. If, during the following semester significant improvement is not demonstrated, the funding will normally be withdrawn. In cases of extremely poor academic performance during any given semester, funding may be terminated immediately without the institution of a probation period.

6.7 Renewal of Assistantship

All funded students will be reviewed at the conclusion of each academic semester with regard to their academic performance and the quality of their work as assistants. The Department will recommend reappointment from these considerations.

6.8 Tenure of Assistantship

Any graduate student whose performance is satisfactory in both academic work and assistantship obligations can expect to retain his/her appointment for a second year. Students will receive support for more than two years only in exceptional circumstances and if extra funds are available.

7.0 RESEARCH ASSISTANTSHIPS

7.1 Faculty Grant Support

If your research or your salary is supported by external funds, there are discrete obligations, which your advisor has to the funding agency supporting the research. If you receive a Research Assistantship or summer salary, you should consider this support much as you would a job which carries with it discrete obligations and responsibilities. These obligations may include specific deliverables and inflexible deadlines. Because of these demands, it is your advisor's responsibility to discuss with you the responsibilities of the RA before the RA begins. You should be both fully aware of and be willing to accept conditions of the RA before accepting such support. Among other things, it is appropriate to discuss with your advisor policies regarding expected working hours, vacations, authorship of papers, and specific deadlines which must be met during the RA.

7.2 Tuition Payment

If you are supported on a Research Assistantship, your GRA will include nine credit hours of tuition. Tuition remission does not relieve the student of payment of the various other University fees and charges. There is no restriction on credit hours and they may be used for courses, research, and/or continuous registration.

8.0 OTHER FUNDING

8.1 Summer Funding

Early in the fall semester you should talk with your advisor regarding summer support. There are limited summer Teaching Assistantships available in the Department; students are advised to contact faculty members who are teaching summer courses directly. If you must take another job, it is important that you leave at least five–six weeks of the summer available for fieldwork or laboratory research. If you are receiving summer support through the Department or a research grant, please consult with the Geology Department Business Administrator to confirm pay rate and pay period information.

8.2 Student Research Grant Support

If you receive funding yourself from such sources as GSA, Sigma Xi, AAPG or VGS, or the Burlington Gem Club, there are obligations attached to this funding. These funds are for use directly supporting research; they are not summer salary. You must account for the money received and should keep receipts. For accountability and for tax purposes, it is best to keep such funds in a separate account. In most cases, you should be prepared to submit a final report to the funding agency detailing how the money was spent (including receipts) and the scientific results the funding generated. Your performance on these grants not only reflects upon you personally, it also reflects upon your research group and the Department as a whole.

9.0 EXPECTATIONS

Below are guidelines by which the faculty hopes to establish a dialog with students in the Geology Department. They are by no means all-inclusive.

9.1 Faculty Expectations of MS Students

1. The data students collect will be of the highest quality, that these data are accurate and reproducible.
2. Interpretations will be defensible and will be supported by data.
3. Students have read and understand the work of others pertinent to their research. This work must be cited correctly and collaborators or others who have provided assistance must be acknowledged.
4. Students should become part of a community of scholars by attending seminars, proposals, progress reports and thesis defenses.

9.2 Faculty Responsibilities to Graduate Students

1. Faculty will provide strong support of students, their education, and their research both within and outside of the Department (e.g., meetings, fieldwork).

2. Faculty will edit proposals, grants, progress reports and theses when given reasonable lead time.
3. Faculty will pose consistent and pointed questions regarding the progress of work, reliability of methods, and justification of interpretations in order to make sure that the thesis work is reproducible, accurate and of the highest possible quality.

9.3 What Happens if Expectations Are Not Met

This document puts forth specific expectations of graduate students. The structure of the Geology MS program is such that the thesis committee and advisor closely support and oversee much of student work; there are numerous discrete deliverables and deadlines, which should encourage students to make continual and sufficient progress toward their degree.

If students do not meet the guidelines set out in this document various things may happen. If drafts of the thesis proposal or progress report are not acceptable to the thesis committee, advisor or the faculty as a whole, the student will not be allowed to defend these documents before the Department and take the Comprehensive Examination. Failure to perform satisfactorily on either part of the Comprehensive Examination may result in the request to repeat the exam before the thesis committee, the faculty, or the Department as a whole. Failure of the comprehensive exam for a second time will result in dismissal from the program. Failure to make what the faculty judges as sufficient progress toward the MS degree may result in funding not being renewed for the following semester. Continually missing deadlines or producing work of low quality will result in the dismissal from the program.

If a faculty member does not meet expectations, students should discuss problems directly with that faculty member as soon as possible. If such discussion does not address issues of concern, students should consider speaking with their thesis committee, the Department Chair, the Dean of the Graduate College, or the University Ombudsperson.

9.4 Competencies

At the completion of the MS Geology graduate degree, students will have the skills to:

- Design and complete a research project under the guidance of an advisor.
- Write a scientific article that could be published in a refereed journal.
- Make a professional public presentation of research.
- Demonstrate facility in a variety of instrumentation and subsequent quantitative data analysis related to the area of research.
- Apply the concepts and information learned from conducting thesis research to a variety of more broadly based problems.
- Demonstrate an ability to place scholarship into the broad context of subject knowledge in geology as well as in the context of the appropriate sub-discipline.
- Integrate the historical development of the field of scholarship into research.
- Use the graduate research experience as a foundation for future applications of the scientific research method to the solution of a wide range of problems in the geosciences.

Metrics for success:

- Presentations at professional meetings, publication of research.

- Pass Parts 1 and 2 of the Comprehensive Examination.
- Computer design of figures, illustrations, data analysis, development of a model in the context of MS thesis research or class work.
- The MS Thesis or refereed publications places the research in a broad context, including exposition of why the research problem is significant, as well as a literature review.
- The research results can be conveyed to a broad audience of both specialists and non-specialists as demonstrated by presentations to non-geologic audiences, such as the UVM Student Research Conference.
- Analysis of longitudinal data collected from alumni surveys in each year's fall newsletter will inquire about post-graduate employment or enrollment in further degree programs.

9.5 Data and Publications

All students are strongly encouraged to publish their research results. Faculty-supported research often mandates rapid publication of results. It is best to discuss the need for and timing of publication explicitly with the graduate advisor at the beginning of the project. If the student is unwilling or unable to publish data promptly which were gathered as a result of faculty financial or logistical support, then the faculty member may publish these data but must properly cite the student's contribution to the project. In many cases, such citation would result in junior authorship for the student.

9.6 Potentially Troublesome Issues

A variety of issues may cause strain between a student and her or his advisor. It may be advantageous to discuss the following issues with the graduate advisor directly so that both the student and the advisor are in agreement: time commitment, vacations, attendance at professional meetings, authorship of papers and abstracts, summer funding, and faculty-student interaction. In most cases, keeping lines of communication open will prevent uncomfortable situations from arising.

9.7 Attendance at Department Functions

It is expected that graduate students will attend all formal department functions including graduate student meetings, progress reports, proposals, thesis defenses, and seminars of visiting lecturers. All attempts should be made to schedule classes so that Monday afternoons (4:00 p.m. to 5:30 p.m.) are left open. At these functions, students are encouraged to interact by asking questions of the speaker. Such questions are particularly encouraged at graduate student presentations and form an active part of the learning process both for the questioner and the speaker. There will be occasions when invited speakers are on campus before or after their lectures. Although optional, we hope students will join these individuals for meals, socializing, and professional interaction.

9.8 Office Space

Office space is provided to all graduate students who request such space for their first two years of residence. After the first two years, office space will be provided at the discretion of the department and only if space is available.

APPENDIX I FORMAT FOR PROPOSAL AND PROGRESS REPORT COVER SHEETS

TITLE
(in capital letters)

A (Thesis Proposal/Thesis Progress Report) Presented

by

John Alden Doe

to

The Faculty of the Geology Department

of

The University of Vermont

(Date Presented)

Accepted by the Faculty of the Geology Department, the University of Vermont, in partial fulfillment of the requirements for the degree of Master of Science specializing in Geology.

The following members of the Thesis Committee have read and approved this document before it was circulated to the faculty:

_____ Advisor
(Type name of Advisor below line)

Date Accepted: _____

APPENDIX II GRADUATE TIMELINE

For students starting in the fall semester

Prior to first semester:

1. Meet with faculty advisor to discuss project possibilities and decide about classes for fall semester enrollment; clarify and document any remedial course work needed.
2. Review this document, discuss MS program schedule and clarify faculty and student expectations.
3. Discuss funding situation explicitly.
4. Get assigned and move into office space.
5. Participate in graduate student orientation activities during the week prior to the first day of classes.

Faculty responsibilities:

- Read and evaluate student transcripts.
- Advise students on fall courses.
- Suggest possible research topics to explore.
- Clearly present program schedule and funding situation.

Student responsibilities:

- Read this document.
- Consider implications of funding situation.
- Follow up on advisor's suggestions and recommendations.

During first semester:

1. Meet frequently with faculty advisor to discuss and define project.
2. Find and read literature sufficiently to help define project.
3. Select committee in consultation with graduate advisor.

Faculty responsibilities:

- Make time available for meetings.
- Suggest project ideas.
- Assist in committee selection.

Student responsibilities:

- Make time to read and think about project.
- Begin to define project components.
- Interview, select and organize committee.

During Second Semester:

1. Prepare draft of thesis proposal for review by faculty advisor, thesis committee, and peers in GEOL 302 Introduction to Graduate Studies.

2. Prepare and submit written project proposal for review by faculty. Get committee approvals on proposal draft before submitting to the Department no later than seven days prior to scheduled presentation date.
4. Present proposal orally to department followed by the oral Comprehensive Examination Part 1.

Faculty responsibilities:

- Help student find appropriate references.
- Thoroughly review and edit draft project proposal.
- Provide specific feedback on proposal and project feasibility at committee meeting.

Student responsibilities:

- Read extensively in order to understand context of project.
- Plan project in detail and demonstrate feasibility to committee.
- Timely preparation of documents and scheduling of meetings.
- Timely revision of proposal.
- Professional presentation of proposal orally and in writing.

During third semester

1. Schedule committee meeting to review summer progress and draft of progress report.
2. Submit written progress report to faculty.
3. Present progress report orally to the Department followed by the oral Comprehensive Examination Part 2.
4. Begin preparation of thesis documents (e.g. literature review, figures).

Faculty responsibilities:

- Thoroughly review and edit draft progress reports.
- Provide specific feedback regarding progress and focus of research at committee meeting.

Student responsibilities:

- Make sufficient progress on research and writing.
- Timely preparation of documents and scheduling of meetings.
- Timely revision of progress report.
- Professional presentation of progress report orally and in writing.

APPENDIX III TEACHING ASSISTANT GUIDELINES

I. Compensation

A graduate student teaching assistantship in the Geology Department consists of an appointment, which includes a stipend and tuition remission. The Geology Department makes this commitment to a graduate student for two years (four semesters) pending continued progress through the program. Partial financial support for a semester of a third year, although possible, cannot be depended upon. The graduate student should, in consultation with their advisor, strive to select a thesis project that can be completed in this time frame.

II. Course Load Commitment

For first year graduate students, the award carries with it the commitment to teach the equivalent of five introductory Geology lab sections per year. The potential exists for the Introductory Geology lab assignments to be partially or wholly replaced by a limited number of advanced Geology courses. Selection of TA's for Geology courses is made by the Geology faculty who teach each class.

III. Time Commitment

1. Each incoming Geology Teaching Assistant is required to attend the August graduate student orientation session. The orientation activities include TA training, lab safety training, and UVM driver's certification. Forms for payroll will also be filled out at this time.
2. Each Introductory Geology lab lasts for approximately three hours per week, not including set up/break down time or time involved in grading assignments. For each lab section, a TA should set aside and post at least one office hour per week. Each TA has the option, but is not required, to offer additional office hours in advance of hourly exams. Each TA should anticipate being asked to help with proctoring and grading at least one hourly exam during the semester.
3. There might be occasions during the semester where a TA will have to miss one of the lab meetings, for example to attend a Geological Society of America meeting. In order to keep all the lab sections on schedule, the lab should not be canceled. TA's must make arrangements with another TA to provide coverage, a favor that should be reciprocated later in the semester. TA's should not put the burden of accommodating their schedule on the students in the lab; in other words, students enrolled in the lab should not need to shuffle into other labs for the week.

IV. Instruction

1. Department Philosophy. The purpose of the introductory Geology labs is to introduce students, the majority of whom are non-science or undecided majors, to the intellectual currency and thought processes of the geosciences. In order to do this, it will be necessary for students to understand some of the language as well as several

fundamental facts and theories; however, we seek to help students develop their higher cognitive learning skills: integration, synthesis and creativity, as opposed to memorization and repetition. We seek to convey the excitement and enthusiasm that arises when we become actively involved in our own learning. In lab settings especially, we wish to diminish the amount of time students spend passively listening in lieu of making observations, evaluating data, and drawing conclusions. As a department, we are also committed to improving every student's written and oral communication skills. At every opportunity, students should be encouraged to articulate and defend their thoughts, in writing and verbally. Students who demonstrate special needs should be referred to the Learning Co-Operative (x64075).

2. Grading. Despite stressing the development of critical thinking skills, many students will be very concerned with evaluation mechanisms and their grades. It is important to tell students at the beginning of the semester what the grading policy is and how their lab grade will be calculated. It is recommended that this be done in writing, in a lab syllabus, which includes TA office location, office hours, and attendance policy, so this document can become a "contract" between TA's and students. After clearly articulating the grading policy (for example, "will spelling count?") TA's must strive to be consistent and fair in its application within and between lab sections. This clarity can be helpful later when, for example, students question the grade they received. Rather than becoming defensive, TA's should reinforce the grading policy and explain to the student why they received a particular grade. In labs such as those in introductory Geology, we often ask questions that require students to draw analogies, evaluate hypotheses, or engage in informed speculation, in other words, situations where there is no "right answer." These more subjective responses mean that students may have difficulty distinguishing why one of their friends received a different grade.

Discussions of grades are a matter of privacy and should only occur between the TA and an individual student. The University policy on privacy requires that no graded materials should be left out in public areas. Issues of Academic Honesty are discussed below.

Because of our desire to encourage the development of critical thinking skills in all students, the introductory Geology lab exercises are designed to stress the analysis of data and observations. For the TA this means that grading of assignments can involve reading "essay" responses and not the less time consuming "multiple choice" or "fill-in the blank" answers. Attention paid to grammar, spelling and writing mechanics can absorb even more time. TA's must learn to balance time commitments for grading with coursework and research commitments.

3. Academic Integrity. In the course of teaching and evaluating students, it is possible that incidents will occur which may be recognized as cases of cheating, or academic dishonesty. In fairness to all students in a class, it is essential that all TA's respond to alleged incidents firmly and in the same fashion. UVM's Code of Academic Integrity is based on the premise that "society entrusts our students and faculty to pursue knowledge and report their discoveries truthfully, any deliberate falsehood or misrepresentation undermines the stature of the University." The University's policy covers acts of plagiarism, fabrication, collusion, and cheating. All TA's and students

are expected to refer to the University's Code of Academic Integrity, which can be found here: <http://www.uvm.edu/policies/student/acadintegrity.pdf>

Occurrences of academic dishonesty may be classified as either minor or major in nature. Minor offenses include such acts as inadequate citation of reference materials or unauthorized collaboration outside of the classroom. Minor offenses can be dealt with directly by the faculty (TA or Professor) with appropriate sanctions. Major offenses are defined as those in which the student gained an unfair academic advantage over others and includes such acts as cheating on exams or the misrepresentation of significant or substantial portions of written work. Major offenses must be reported to the Center for Student Ethics & Standards within two weeks of the offense. Please consult the official University policy for more details regarding the process. Please note that no instructor (TA or Professor) or department chair has the right to discipline students in alleged cases of major academic dishonesty.

4. Teaching Awards. Every year, the Graduate College sponsors an award, which recognizes the Outstanding Teaching Assistant at the University. Each Department may nominate one candidate, who we recognize as the Outstanding Geology Teaching Assistant. Competition for this prestigious University-wide honor is fierce, and is based on several criteria, including letters of recommendation from the supervising faculty and Department Chair, and on classroom evaluations. It is therefore in the TA's best interest to do evaluations in each lab section at the end of the semester. Besides competition for this award, evaluations are one way in which TA's can receive feedback on performance and areas for improvement. Satisfactory performance as a TA is also described in the Graduate Handbook as a pre-requisite to continued departmental funding. See any faculty member for examples of frequently used evaluation forms.
5. Harassment. It is a policy of the University that no member of the community may harass another. Harassment may include sexual harassment as well as any means an incident or incidents of verbal, written, visual, or physical conduct based on or motivated by actual or perceived race, creed, color, national origin, marital status, sex, sexual orientation, gender identity, age or disability. You are expected to be familiar with UVM's policies (<http://www.uvm.edu/policies/?Page=alphalist.php>) Disciplinary action can be brought against any student, faculty or staff member.

Reports of harassment should be made directly to the Office of Affirmative Action (x63368), where they will be handled in confidentiality.

It is a priority of our Department to be considered a safe and welcoming place for a broad spectrum of individuals, regardless of race, gender, ethnicity or sexual orientation. Behavior or language that is offensive to others will not be tolerated. Behavior or language, which others find a form of harassment will be subject to University Affirmative Action/Equal Opportunity policies. Avoid potential problems by treating everyone with respect, regardless of perceived differences. Needless to say, dating a student in one's lab while one is in a position of power places one in a vulnerable position regarding a potential harassment charge and certainly brings up the issue of "fairness."

APPENDIX IV GUIDELINES FOR PROPOSAL AND PROGRESS REPORTS

The research proposal should include at minimum the following sections. The faculty realizes that students and advisors may prefer various styles of presentation and that research proposals will differ in structure and style. In all cases though, a well-researched proposal is the first step toward writing a thesis. **PROPOSALS AND PROGRESS REPORTS MUST BE APPROVED BY THE ADVISOR BEFORE SUBMISSION.**

1. Title and signature page.
2. Abstract—a succinct (no more than 200 word) summary of the proposed research that directly states the problem to be addressed.
3. Introduction—a short overview of the proposed research and its significance, placing the proposed work in context.
4. Selected evaluation of previous work, which demonstrates understanding of the current status of research related to your project.
5. Methodology and research plan that indicates specifically how the research objectives will be accomplished.
6. Discussion of possible outcomes and impact on the specific field of study.
7. Bibliography including literature cited and literature germane to thesis research.

The progress report should be succinct. It should present your findings to date and elaborate upon any changes made to your original research plan. The progress report should include sufficient background information to guide the reader, but should not restate the proposal. The progress report can be considered the second step toward writing the thesis. The progress report should include at least:

1. Title and signature page
2. Introduction
3. Concise summary of work conducted to date
4. Initial interpretations of data collected
5. Description of work remaining
6. Detailed time line for completion of research

APPENDIX V CHECKLIST FOR THESIS MATERIALS AND FACILITIES

Checklist for Thesis Materials and Dept. of Geology Facilities

For a thesis to be complete and the MS degree awarded, the department requires that all rock, soil, sediment, ice and water samples that have been collected as part of the thesis work be cataloged and stored to the satisfaction of the Thesis Advisor. This also includes all data and prepared materials (thin sections, datasets, notebook, etc.) that were made in the course of study. In addition, all departmental facilities used in the course of thesis research must be returned to good order after their use.

To ensure that these steps are taken, the *Electronic Thesis and Dissertation Rights and Permissions* form, which is necessary for degree completion, will not be signed by the Advisor until the following endorsements are obtained:

1. The student will meet with the Departmental Senior Laboratory Research Technician to ensure that all laboratories and preparation rooms utilized during the research have been returned to good order,
2. The research advisor will meet with the student to ensure that all research material has been properly curated to the advisor's wishes and granting-agency requirements,
3. All departmental keys have been turned in to the departmental Administrative Assistant.

Once confirmation is received from the Senior Laboratory Research Technician and the Administrative Assistant, the required forms may be signed.

GEOLOGY FACILITIES CHECKLIST

(Completed form to be returned to MS Thesis Advisor)

STUDENT NAME:

FACILITIES (To be completed with Senior Laboratory Research Technician and Advisor):

ROOM	INSPECTION DATE	APPROVAL

KEYS (To be completed with Departmental Administrative Assistant and Laboratory Supervisors):

ROOM	KEY NUMBER	RETURN DATE/APPROVAL

THESIS MATERIALS (To be completed with Thesis Advisor):

THESIS MATERIALS: Samples/Maps/References	ARCHIVED LOCATION	APPROVAL