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Graduate Student Information (The White Book)

DEPARTMENT OF EARTH SCIENCES

**Dartmouth College
Hanover
NH 03755**

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Attached:

Funding worksheet

M.S. requirements worksheet for annual review

Ph.D. requirements worksheet for annual review

Course plan worksheet

1. Summary of key deadlines

Important dates for MS candidates

Year 1	April 1st Submit names of committee members	June 15th Submit thesis proposal signed by committee
Year 2	Late May/Early June Get thesis committee approved by graduate studies. Last day to submit thesis for June graduation is May 15 th , September 1 for December graduation.	Prior to Scheduling Defense Get degree requirement form signed by grad coordinator

Important dates for PhD candidates

Year 1	April 1st Submit names of summer research committee members	June 15th Submit summer research proposal signed by committee
Year 2	First reading day of Fall term Written qualifying exam	Prior to Feb. 1st Present and defend results of summer research project. Turn in qualifying exam form.
Year 3	Prior to Dec. 15th Present and defend a thesis proposal before thesis committee	Prior to Feb. 1st Get thesis committee approved by grad studies Prior to Mar. 1st Submit copy of thesis proposal signed by committee including general examiner
Year 4/5	Prior to June 1st Yearly committee meeting-20 min. presentation. Submit summary paragraph signed by advisor to grad coordinator	Prior to Scheduling Defense Get degree requirement form signed by grad coordinator

2. Introduction

This document is intended to introduce incoming graduate students to the Earth Sciences (EARS) community, and to provide guidance for all EARS graduate students wishing to make best use of our resources and to work successfully and expeditiously toward completion of an advanced degree. The EARS faculty encourage all students to learn from each other, and for new students especially to take advantage of the experience and knowledge of veteran students. The topics covered in this document can help initiate that exchange of information.

A College website dedicated to aspects of graduate life at Dartmouth can be found at

www.dartmouth.edu/~gradstdy/studentlife/index.html

Academic requirements of the M.S. and Ph.D. degrees are laid out in appropriately titled sections appearing at the end of this document. Much of this material can be found in the Dartmouth College Bulletin of Organization, Regulations and Courses (ORC), and we present it here as well as a convenient reference. **However, please note that the ORC is the authoritative document for information on course offerings and degree requirements. This document is not meant to define the degree requirements, but rather to explain how the degree requirements in the ORC are operationalized. If one finds that the ORC and this document are in conflict, the ORC supersedes this document.** The ORC can be viewed online at

www.dartmouth.edu/~reg/courses/desc/

Other, relevant information, drawn from the Dartmouth Graduate Student Handbook issued by the office of the Dean of Graduate Studies, is also included here, such as a description of College-wide policies on student representation, and guidelines for thesis preparation, printing and binding. This document can be viewed online at

www.dartmouth.edu/~gradstdy/services/COMPLETE.HANDBOOK.09.pdf

A wide range of additional information pertaining, for example, to instructional and advisory programs in teaching, learning, and writing skills can be reviewed at

www.dartmouth.edu/~gradstdy/

Students should regularly consult the ORC and the Dartmouth Graduate Student Handbook on all academic matters. These documents are sent to all graduate students upon admission to the graduate program. While we attempt here to be as up-to-date and accurate as possible, the ORC lists the official rules and degree requirements of the College.

3. Departmental mission

Our mission is to achieve balanced success in undergraduate education, graduate-level training and scholarship of the highest quality in our chosen areas of specialization in earth and

environmental geosciences, and competitive grantsmanship in support of our research. The hard work and dedication of our graduate students are essential to achieving this mission, with particular emphasis on student contributions to research and scholarship as well as to our efforts in undergraduate education.

4. Departmental personnel

- A. Faculty**—traditionally the Earth Sciences Department has been home to ten tenure-track faculty and up to five research faculty in residence and visiting researchers. Professor W. Brian Dade currently serves as Departmental Chair. Professors Robert Hawley and Carl Renshaw currently serve as graduate liaison and graduate academic coordinator, respectively. Backgrounds and research interests of individuals currently on the EARS faculty can be reviewed on the Departmental web site found online at www.dartmouth.edu/~earthsci/
- B. Staff**—Patricia (Patty) Alves is the Departmental Administrator; Mila Pinagin is her assistant. Ed Meyer and Josh Landis are members of our technical staff responsible for the safe operation and maintenance of all laboratory facilities. Ed also serves as Director of our undergraduate field program informally known as ‘The Stretch’. Suzanne Auerbach is the grants manager for Earth Sciences.

5. College regulations regarding the quality of our working environment

- A. Dartmouth is a Drug Free Workplace**—Dartmouth College prohibits the unlawful possession, manufacture, distribution, or dispensing of illicit drugs and alcohol by its employees on College property or as a part of its activities.

In the state of New Hampshire, possession of liquor or alcoholic beverages by a person under 21 years of age is a violation of law and punishable by a fine. New Hampshire and Federal laws prohibit the possession and distribution of controlled drugs. Controlled drugs include, but are not limited to, marijuana, cocaine, crack, heroin, and LSD. Criminal sanctions for possession and distribution can range from fines to imprisonment. Although the College does not intend to act as a law enforcement agency, it will not seek to protect individuals who have violated the law. Further, the College will cooperate to every feasible extent with law enforcement officials if an on-campus investigation is necessary.

An employee supported by a federal grant or contract must notify his or her supervisor of any drug conviction within ten days of the conviction. Within a subsequent ten-day period, the College must notify the contracting agency of the conviction. In addition, the College will within thirty days of the notice of conviction take appropriate disciplinary action which may include termination of employment or dismissal from the graduate program.

Employees who violate any aspect of the above policy will be subject to disciplinary action, which may include termination of employment or dismissal from the graduate program. The employee may also be required to participate in a rehabilitation program.

B. Smoking Policy—It is the policy of Dartmouth College to regulate and minimize the effects of smoking in the work place in accordance with State of New Hampshire legislation. These regulations specifically prohibit smoking in all shared work areas. "Work area" is defined as any enclosed location, permanent or temporary, where faculty or staff perform any work-related duties in the course of employment. In practice, this includes the entire Department.

It is not the intent of this policy to supersede rules for areas where smoking is prohibited by fire, safety, and health codes or business necessity. Any other smoking policies should be reviewed for compliance with this policy. The Department shall provide a copy of its written rules to any member of the faculty or staff upon request.

It is illegal for an employer to fail or refuse to hire or to discharge any individual, or otherwise to discriminate against any individual with respect to his or her compensation, terms, conditions, or privileges of employment because the individual is a smoker or non-smoker.

It is the desire of Dartmouth College to provide assistance to any member of the faculty or staff who smokes and would like to quit. The Health Awareness Program currently offers smoking cessation classes and other assistance. Additional information on this topic can be reviewed online at

www.dartmouth.edu/~health/depts/pcpm.html

6. Selected logistical issues

A. Housing—Housing in Hanover and the immediate surroundings of Dartmouth is limited, so early action in finding and securing suitable accommodation is recommended to all.

i) The College leases a limited number of apartments to first-year graduate students. Inquiries about these apartments should be addressed to Mr. Gary Hutchins, Graduate Study Office, Dartmouth College, Hanover, NH 03755.

ii) Married graduate students have access on a first-come/first-served basis to apartments in Sachem Village, a college-owned housing complex located about 1.5 miles south of the Dartmouth Green. These apartments are also occasionally available to single students if there are openings. Inquiries should be addressed to Lois Gross, Office of Rental Housing, 7 Lebanon Street, Hanover, NH 03755.

iii) Many EARS graduate students have, by preference or necessity (as availability of College housing is not assured), found suitable accommodations elsewhere in the surrounding region. The Office of Rental Housing has a computer listing of private rentals. This listing can be accessed at: www.dartmouthre.com/

B. Travel—Interstate Highways 89 and 91 meet at White River Junction (WRJ), VT, located 5 miles south of Hanover. Vermont Transit offers bus service between WRJ and Manchester

Airport, Boston and New York City. The Dartmouth Coach (no College affiliation) operates several trips each day between Hanover/Lebanon and Boston with stops at Boston's South Station and Logan Airport. Dartmouth Coach also offers daily service to New York City. Information regarding Dartmouth Coach schedules and fares can be found at www.dartmouthcoach.com/

Amtrak provides daily passenger service aboard the 'Vermont' from Washington, D.C., Philadelphia, New York, and intermediate points to WRJ. Information regarding train schedules and fares can be found at www.amtrak.com, where you can also purchase tickets. There is a small airport in West Lebanon with service to and from Boston via Cape air. Taxi service is available to WRJ and Lebanon.

- C. **Parking**—Availability of parking in central locations around campus is limited, and regulations are strictly enforced. There is ample parking in large communal lots within a 15-minute walk from the Department. Parking anywhere on campus requires registration of one's vehicle with the College. Additional information can be reviewed online at www.dartmouth.edu/~fom/services/parking/info/index.html

7. Financial support

- A. **Stipend and tuition**—All Dartmouth Fellows (whether one is a Teaching Assistant or a Research Assistant) in Earth Sciences receive a twelve-month tuition fellowship and additional monthly stipend, the levels of which are set annually by the College. The amount of stipend support is indicated in individual acceptance letters.

i) **Duration of support**—Normally, a student in the EARS M.S. program receives support for a maximum of seven terms (One term is more or less 3 months long; Dartmouth operates year-round with four terms per year). Thus, the M.S. should be completed in two years. Ideally, a Ph.D. candidate is supported for a maximum of 10 terms beyond the M.S. or, equivalently, a total of 17 terms after the B.S (or B.A.). Thus, the Ph.D. program should be completed in three years following an earned M.S. degree or, equivalently, within five years following an earned B.S.

ii) **In the event of competing, external support**—If a student is supported by funds from a source other than the College while in academic residence, he or she will receive no stipend from the College unless the level of support is less than the then-prevailing Dartmouth stipend rate. In that case, the College will attempt to make up the difference.

- B. **Financial assistance**—Students requiring additional financial assistance should consult the Office of Graduate Studies to explore the possibility of obtaining a student loan. Additional information can be reviewed at

www.dartmouth.edu/~gradstdy/finaid/

- C. **Travel expenses to attend professional meetings to present research results**—Information regarding general research-related expenses is given in Section 26 of this document. Here, we introduce the process for obtaining reimbursement of expenses related to travel to professional meetings to present one’s research results.

If a student presents a paper at a professional meeting, reimbursement for some or all of the associated travel expenses may be provided, upon application, by the Office of Graduate Studies and the Department of Earth Sciences. According to College policy, a student will receive support for attending only one such meeting while a graduate student at Dartmouth, whether that support is awarded by the College or the home Department. Support for attending additional meetings may be available, however, especially if drawn from outside funds. In general, the Department encourages students to apply first for support from the Graduate Studies Office, and then to apply to the Department. However, this course of action may not always be optimal; individuals are strongly encouraged to consult with their advisors and the Departmental Administrator regarding the optimal use of funds for research-related travel well in advance of the proposed travel. **Successful requests for reimbursement of costs of research-related travel, made either to the Graduate Studies Office or to the EARS Department, must be made well in advance of the proposed travel, and must include a record of all such funds awarded to date.**

Dartmouth College has an agreement with Travel Leaders to help arrange with travel arrangements with preferred travel providers. Contact information can be found online at:

www.dartmouth.edu/~control/travel/tlinfo.html

- i) **General guidelines for requesting funds from the Graduate Studies Office**—Request for support is made by letter to the Graduate Studies Office, giving the name of the professional meeting, the title of the paper to be presented, a detail of expenses, and tabulation of previous meeting support. The Graduate Studies Office usually pays 75 percent of the economy airfare up to a maximum amount of \$500. Additional information on this process can be reviewed in the Graduate Student Handbook, found online at:

www.dartmouth.edu/~gradstdy/funding/travelawds.html

- ii) **General guidelines for requesting Departmental funds**—Request for support is made by letter to the Departmental Chair, giving the name of the professional meeting, the title of the paper to be presented, a detail of expenses, and tabulation of previous meeting support. Funds awarded for reimbursement of food expenses come out of an individual student’s research or meeting allowance, and not in addition to these allowances.

- iii) Reimbursement requires completion and submittal of travel expense spreadsheets. An introductory document on this topic can be found online at (with on-campus access only):

<http://geo.dartmouth.edu/oncampus/intranet/reimbursement.pdf>

Two key points with regard to requests for reimbursement that all should take to heart are as follows:

- a) All requests for reimbursement of expenses must be accompanied with original, itemized receipts.
- b) Submittal of requests and spreadsheets required for reimbursement should take place within 30 days of the incurred costs.

General Reimbursement Policies:

The College will only reimburse expenses incurred in connection with College business that are appropriately documented by the employee, student, or visitor.

- Reimbursement will be made on the basis of actual and reasonable expenses incurred for necessary business expenses or approved per diem amounts.
- The basic policy governing travel and business expenses is that an individual should neither gain nor lose funds in the course of traveling or conducting College business.
- The College will not reimburse travelers for expenses which are inherently personal in nature such as child care, clothing, personal recreation, entertainment, etc. Reimbursable expenses must have a valid, business purpose.
- Assuming a reasonable level of comfort and convenience for the traveler, every effort should be made to keep College expenses to a minimum.

To ensure success in the reimbursement process, please heed these guidelines. Consult the Departmental Administrator well before the event.

8. Health and life insurance

- A. **Health insurance**—Students are required to have health insurance. Upon enrollment at Dartmouth each student will automatically be billed for individual coverage under the Dartmouth Student Group Health Insurance Plan unless he or she can prove that other adequate coverage is in hand (i.e., provided on parent's or spouse's plan). Dartmouth will then credit the student's account for the amount of a single coverage. Coverage of a spouse and/or child is not automatically included in the Dartmouth Plan; however, health coverage for one's spouse and/or children is available through the Dartmouth Plan at additional expense. Further information and rates for the Dartmouth Group Health Insurance Plan can be found at:

www.dartmouth.edu/~gradstdy/services/COMPLETE.HANDBOOK.09.pdf

- B. **Life insurance**—All graduate students should be aware that **students are not covered by any form of life insurance underwritten by the College**. This is the case even though students may conduct field research or instructing in the field under the direction of the Dartmouth faculty. Each student is urged to consider this matter carefully.

9. In the event of an injury

In the event of serious injury, contact the Departmental Administrator and the Graduate Studies Office as soon as possible.

10. Employment outside the Department of Earth Sciences

The policy for compensated work outside of one's home academic Department is governed by the Graduate Office and articulated in the Graduate Student Handbook as follows:

Graduate students who are fully supported (a full tuition scholarship and a full stipend) cannot normally receive additional payment from Dartmouth College for services rendered and cannot normally accept employment outside the College while enrolled. Exceptions may be granted in cases of unique academic or professional benefit or documented financial hardship. Any exception will normally not exceed 8 hours per week and must have the written approval of the graduate student's advisor, Department Chair or Graduate Program Committee, and the Dean of Graduate Studies.

Consistent with this policy, the EARS Department recognizes that graduate students will occasionally find rewarding opportunities outside of the Department and, in any event, have additional financial needs. Accordingly, the Department will normally support a request for approval to pursue an exceptional opportunity for compensated work outside the Department of up to 8 hours per week. Pursuing such opportunities should be considered in the context of one's teaching duties and the demands of one's academic goals.

11. Teaching and Research Fellowship obligations

Dartmouth Fellows are essential to fulfillment of the Departmental mission. Accordingly, Fellows are required to serve as either a Teaching Assistant (TA) or a Research Assistant (RA) each typically requiring approximately 20 hours of associated effort each week. Duties may include providing instruction in one-or-more, course-related laboratory sessions, grading papers, serving as a Research Assistant under the direction of one's research advisor, and carrying out Departmental functions such as organizing collections, overseeing the computer room, publishing an occasional newsletter, etc. Some specific guidelines and obligations in meeting these requirements are as follows:

- A. **TA residency**— Dartmouth Fellows serving as Teaching Assistants (TAs) should be in residence at least two days prior to the beginning of each academic term regardless of their specific chores, to help in the preparation of course and laboratory materials. Ultimately, TAs are answerable to individual research advisors and course instructors regarding exact scheduling of assigned duties. TAs are expected to be in residence during the entire academic term in which they are teaching.

- B. **Grad-group grading sessions**—All graduate students are eligible to be called upon at any time to assist in the grading of examinations for the large, elementary courses. To facilitate the distribution of the grading load, professors will attempt to provide to their TAs, early in the term, the estimated number of extra graders needed for exams or papers. At the end of the term, this grading may well extend into the between-term breaks. If a Research Assistant has made the proper arrangements with his or her advisor to take leave, the student is still responsible to his or her fellow-students for his or her share in the mid-term or final grading of the examinations in the introductory courses.

It is the TAs' and fellow graduate students' responsibility overall to agree on the required graders at the appropriate times. In the absence of agreement, no student may leave town until all graduate obligations with respect to the grades in all introductory undergraduate courses have been fulfilled. In this regard, we prefer to leave the overall balancing of the Departmental load that rests on our graduate fellows to the cooperation and sense of fairness of the graduate group.

- C. **Summer absence**—Because Dartmouth operates on a year-round, 4-term basis, and because there are large undergraduate courses offered during the summer term, it is necessary that some teaching fellows be in residence during that term. We make every effort to accommodate thesis research and other plans of graduate students during the summer term, but must give the summer instructional obligations first priority. **It is imperative that all graduate students seek approval of the Chair before making any plans or commitments to be elsewhere for the summer term; one's leave during summer term should be approved by the faculty overall.**
- D. **TA assignments**—The assignment of teaching duties will be made in accordance with the Department's research and instructional needs. If a student has a strong preference for teaching in a specific course, we urge the student to consult the professor in charge of that course prior to the beginning of the term. While we can not guarantee that all wishes will be met, we will do our best. When a student has been assigned to a course, it is the student's responsibility to seek out the professor in charge to establish the TA's duties and schedule. If duties include grading course assignments and exams, it is important that materials be graded and returned promptly.
- E. **Company duties**—In addition to teaching and/or research duties, each student will be assigned a 'company' duty to ensure that teaching rooms and labs and research equipment are kept in operation, the computers and software are serviceable, a periodic newsletter is written, etc. These duties are rotated each term.
- F. **Vacation**—Each graduate student is entitled to 3 weeks paid vacation during the year. The timing of any vacation and/or prolonged absence from the Department should be considered with one's Departmental obligations and research schedule in mind, and should be discussed with one's advisor.

- G. **College Drivers**—Some of the undergraduate courses include field trips that are led by graduate teaching assistants. As a result, a TA may be required to drive a college van, which in turn requires that the student be ‘van approved’ by the College. This is an important responsibility, for which all graduate students are encouraged to be prepared as soon as possible. Please contact the Departmental Administrator for further information, and review the College Driver Policy online at

www.dartmouth.edu/~fom/services/parking/driver-safety/policy.html

- H. **Professional conduct & ethics training**—All graduate students are expected to hold themselves to the highest standards of professional conduct. Toward this end, **all first-year graduate students are required to participate in a College-wide training program in the basics of professional ethics**. More information about this program can be viewed online at

www.dartmouth.edu/~gradstdy/grdethics.html

Over the last several years, an EARS faculty member has convened one of the training sessions in professional ethics. We encourage new EARS graduate students to enroll in this session if possible.

In 1962, the Dartmouth student body voted to adopt the principle that "all academic activities will be based on student honor". As members of the Dartmouth community, and as potential mentors of Dartmouth undergraduate students, all EARS graduate students should be familiar with this principle. Please review the key elements of this policy at:

www.dartmouth.edu/~uja/honor/

College policy concerning a consensual relationship between a graduate student and any student or employee he or she supervises or evaluates can be viewed online at

www.dartmouth.edu/~gradstdy/students/undergradrel.html

12. Departmental seminars

In addition to requirements associated with one’s Teaching and Research Fellowships, all graduate students are obligated to contribute to the intellectual life of the Department. Such contributions include participation in our Departmental seminars, as follows:

- A. **Departmental research seminars / EARS 121**—At least once a week during Winter and Spring terms, the EARS faculty host a Departmental Seminar during which visitors or Dartmouth faculty present aspects of their current, ongoing research. Departmental faculty regularly use these occasions to recruit and screen candidates for positions within the Department. Engaged turnout for such events, of course, reflects well on the Department. Additionally, these seminars are excellent opportunities for all graduate students to keep current with state-of-the-art research, and to reflect on the art of successful scientific

communication (sooner or later we all must give such talks!). Accordingly, **all graduate students are required to attend these seminars as part of their professional training.** To this end, students are required to enroll in (non-credit) Earth Sciences 121 during Winter & Spring Terms every year.

- B. **Geolunch**—Additionally, each graduate student, while in residence, is expected to present once each year during the informal, student-run "Geolunch" brown-bag lunches. Geolunch is an opportunity to keep up to date on work in progress in the Department and beyond, and for individual members of the Department to meet informally once a week.

13. Student-run field trips

The Departmental faculty recognize that the life of the mind is enriched by opportunities to get into the field. Graduate students occasionally organize such trips and seek Departmental support. To win this support, a field trip must be approved by the faculty at large, and approval is given only if the following can be demonstrated in a well-crafted 3-5 page proposal prepared by the graduate students. The field trip must:

- A. claim meritorious scientific content, with a well-designed field guide;
- B. have a well-designed and comprehensive budget;
- C. invite participation of members of the EARS Department (undergraduates and faculty as well as graduate students);
- D. and be scheduled and limited in duration in consideration of our Departmental mission, namely, balanced success in teaching and high-quality and productive scholarship and research.

In addition, the faculty expect that:

- E. ...the field guides will be made available to them;
- F. and that project will include a post-trip, oral presentation reporting on the expedition to the Department during a Geolunch as soon as is convenient.

When a proposed graduate field-trip wins faculty approval, the Department will typically cover expenses associated with acquisition of maps, preparation and printing of field guides, lodging, approved forms of overland travel, and up to 60 percent of group-travel airfare booked with Travel Leaders. The Department may cover other costs on a case-by-case basis, but does not cover food expenses.

14. The Morse Fund

Generous alumni have established the Morse Fund in honor of Grace & Roger Morse, two former, long-serving and beloved members of our administrative staff. The Fund is designed to support the study of Earth Sciences. Specifically, the fund will be used for purposes proposed by undergraduate and graduate students, subject to College policy and approval by the Earth Sciences Department Chair, to support and improve the educational experience and learning environment available to the students. Uses could include, for example, funding a field trip, buying equipment for the student computer lab, or even maintaining the foosball table in the Department lounge that has been so successful in fostering both social and intellectual interaction among all members of the Earth Science community. A committee of three students, each elected by one of three constituencies on their own initiative, undergraduate declared majors and minors, Masters candidates, and Ph.D. candidates, will decide on the use of the Morse Fund each year. Additional information about the Morse fund can be viewed online at (with on-campus access only):

http://geo.dartmouth.edu/oncampus/intranet/morse_fund.pdf

15. International Students

- A. **The International Office** is the first place to go for services and programs for the more than 1,050 international students, faculty, and scholars who study and work at the College. Additional information can be reviewed online at

www.dartmouth.edu/~ovis/

- B. **International Student Programs**—The Office of Pluralism & Leadership (OPAL) is an umbrella organization for programs designed to help international students adjust to life in the US. Such programs include orientation sessions, an International Friendship Family Program, an International Student Mentor Program, an English Conversation Group, among other experiences. Additional information and links to many programs can be reviewed online at

www.dartmouth.edu/~opal/international/index.html,

Alternatively, contact Stephen Silver, Director of International Student Programs, at 603 646-2331.

- C. **Support for those for whom English is a Second Language (ESL)**—An ESL program is run by the Rassias Foundation (<http://rassias.dartmouth.edu/>) for incoming graduate students. This brief program focuses on grammar and pronunciation.

Judith Hertog (Judith.Hertog@dartmouth.edu), a Writing Program ESL Specialist with the Institute of Writing & Rhetoric, provides free English-language assistance to international graduate students. Hertog's primary emphasis is on writing, and she offers two key services in this regard: free private consultation, and weekly study meetings. Students can meet with

her to get feedback on papers they are preparing to submit, to practice oral presentations, or to consult with her about other ESL-related matters. Additional information can be reviewed online at

www.dartmouth.edu/~writing/program/staff.shtml

16. Departmental facilities

The fulfillment of our Departmental research and teaching missions, and indeed our daily lives in the Department, are made easier and more enjoyable with access to our shared facilities and amenities. The following provides an overview of some of these.

- A. **Scientific equipment and laboratory facilities**—All scientific equipment in EARS Departmental laboratories is available for use by our research students and staff, provided the use is clearly research-related and the potential user is familiar with the proper operation of the equipment. Any student interested in having access to one of our facilities or a piece of scientific equipment should obtain permission and guidance on proper use before attempting to use it. Continued access to any or all of EARS facilities by an individual is contingent upon his or her thoughtful and courteous use of the facilities. Failing to meet these requirements could result in revoked privileges; persistent failure to meet these requirements could result in dismissal from the EARS graduate program.

Additional information on the capabilities and availability of our various scientific facilities can be reviewed at

www.dartmouth.edu/~earthsci/facilities.html

Selected amenities available to students on a daily basis are as follows:

- B. **Communal computing facilities**—MacIntosh and PC computers are available in room 217 Fairchild. These personal computers may be used by all members of the Department for commonly-shared computing needs, including access to College mainframe computers, electronic mail, and Departmental file servers. The graduate student "computer Czar", or most veteran graduate students for that matter, can provide information regarding the software available. Data and other files can be saved to Geo, the Departmental server.
- C. **Telephones** are available in all graduate student offices for calls placed within the US. Please limit personal calls.
- D. **The copy machine in Room 216** is available to all in the Department; the code for the copier for graduate students is 7777. Printers are available throughout the Department for Department-related printing only (locations include Room 216—mail room, 217—student computer lab, and 211—Sonder-Renshaw computer lab). In the event of operational or maintenance issues, please contact technical staff member Ed Meyer.

- E. For general convenience, a **refrigerator** to store milk, lunches, etc, a **toaster**, and a **microwave** oven are located in Room 216. Additionally, coffee is available there for a nominal fee. Please exercise common courtesy in using these facilities—For example, food stored in the refrigerator should be labeled with name and date, so that out-dated food can be regularly discarded. In general all are responsible for keeping clean the refrigerator, coffee-machine(s), countertops and sink. Do not dump coffee grounds in the sink. Avoid cooking foods in the microwave with ‘aromas’ that will permeate the building.

In addition, we request that the following policies be strictly upheld:

- F. To assure the privacy of academic records and for legal protection, and to guard against theft and/or use of our facilities by unauthorized people from outside the Department, **all administrative offices and Room 216 are to be locked and off-limits after normal office hours.** Everyone is responsible for meeting this request.
- G. **Sleeping overnight in the Department is in violation of rules and policies** set by our College insurers. Campus police patrol the Department at night, and will request that those present leave the building unless legitimate work is being undertaken.
- H. **Please exercise a sense of professional decorum, common courtesy, and common sense** in one’s day-to-day residency of the Department. Issues that have come up in the past prompt us to request specifically that musical instruments or radios be played only in personal offices with the door closed and the volume turned low. Bicycles or pets may be kept in one’s office only if they do not interfere with anybody’s well-being.

17. Graduate student representation

In all matters described in this document, an individual student is encouraged to voice his or her ideas primarily to one’s individual advisor and thesis committee. Alternatively, graduate students can voice their perspectives collectively in the following ways:

- A. **Council on Graduate Studies (CGS)**—One student from each of the graduate departments at Dartmouth College is elected by his or her peers to a council which meets regularly with the Dean of Graduate Studies. The primary purposes of this group are to present the Dean with ideas for the improvement of graduate education and graduate life in general, and to serve as a sounding-board for the Dean on matters of evolving College policies. Additional information can be viewed online at

www.dartmouth.edu/~gradstdy/cgs2009.html

- B. **EARS Departmental representation**—The EARS student serving as a CGS representative, plus up to two other EARS students selected by their peers, additionally serve together as graduate representatives to the Earth Sciences Faculty. These individuals may attend Department faculty meetings upon request from the faculty and serve generally as the

contacts between the EARS graduate student community and the faculty. Students should select their representatives at the beginning of each Fall term, and subsequently meet with them at least once each term to review concerns regarding graduate life, and to share serious concerns which will be relayed to the faculty in a timely and constructive way.

18. Grievance procedures

An individual graduate student may find he or she feels aggrieved regarding, for example, an alleged violation of the terms of agreements and guidelines laid out here and elsewhere, a dispute about the diligence and fairness of an advisor's supervision, perceived issues in the mismanagement of remuneration, joint publication, as well as issues of gender or racial bias, favoritism, or concerns about conduct. The Department and College have established procedures to handle such grievances.

- A. Allegations of scientific misconduct, violations of the academic honor principle, and certain issues of professional and personal conduct (sexual harassment, discrimination and other alleged violations described in the Graduate Student Handbook under code of conduct-non-academic regulations), must be reported to and handled by the Graduate Office.
- B. Resolution of other grievances will be a graduated process, beginning with the student's advisor or thesis committee. Thus, likely procedural steps for the aggrieved student are as follows:
 - i) Resolution within the Department or Program
 - a) If appropriate, an aggrieved student should speak directly to the person who allegedly bears responsibility for the complaint with a view to achieving satisfactory resolution.
 - b) If action (a) proves inappropriate or unsatisfactory, an aggrieved student should consult his or her graduate advisor and members of his or her thesis committee on the matter.
 - c) If action (b) proves unsatisfactory, a student can request through the Graduate Coordinator(s) or Departmental Chair that an ad hoc Departmental Grievance Committee address the issue. This committee ideally should include faculty and graduate students.
 - ii) If actions (i a-c) prove unsatisfactory, the student should contact the Assistant Dean of Graduate Studies to arrange mediation. For further details on this process, please refer to the Graduate Student Handbook.
 - iii) If the Dean of Graduate Studies, working together with the aggrieved student and appropriate faculty member(s), is unable to reach a satisfactory resolution through mediation, the student can request in writing a formal hearing and ruling by the Dean of Graduate Studies and the Committee on Student Grievances. Formal hearings are conducted as described in the Graduate Handbook (see sections titled "Committee on Student Grievances" and "Formal Hearing" under Academic and Conduct Regulations).

19. General information regarding advanced degrees in the Earth Sciences

- A. **Degrees offered**—The Department of Earth Sciences awards both M.S. and Ph.D. degrees in Earth Sciences. There are three degree tracks: 1) For the M.S. degree only; 2) For the Ph.D. degree after completion of an M.S. degree in the Department or elsewhere; or 3) For the Ph.D. degree directly, without first receiving an M.S.

The M.S. and Ph.D. degrees alike require a solid background in the Earth sciences. Accordingly, many aspects of curriculum and committee selection, as well as academic requirements and regulations given below, apply to both degrees. The main difference between the degrees is in the scope and depth of the thesis investigation and depth of knowledge in the disciplines that most closely relate to the thesis.

- B. **Expectations of publication**—Both the M.S. and Ph.D. degrees at Dartmouth require a written thesis. The M.S. degree is a professional degree, and the M.S. thesis is expected to report on research that is ultimately worthy of peer-reviewed publication. A Ph.D. thesis is expected to report on research worthy of three or more peer-reviewed publications, with the majority of which published or in review/revision by completion of the PhD.

- C. **Grading in graduate courses**—The following grades are used in graduate-level courses: HP (high pass), P (pass), LP (low pass), and CT/NC (Credit/No Credit). Credit/No Credit is assigned for EARS 121 (seminar participation), EARS 141-143 (thesis research), and EARS 157 (undergraduate teaching). Consult the ORC for explanations of these grades. When graduate students take undergraduate courses, passing grades of C+ and lower will be considered a low pass. If a student receives two low passes, his or her status in the program will be reconsidered, and student dismissal from the graduate program is an option. In general, if a graduate student also fails consistently to meet expectations communicated by one's curriculum/thesis advisory committee regarding reasonable progress toward completion of assigned research and coursework, he or she may be also be subject to dismissal from the graduate program.

20. Curriculum and advisory-committee selection

- A. **Initial advising**—At the beginning of each fall term, first-year graduate students meet individually with their academic advisor to discuss their individual course of study for the year and beyond. An initial academic advisor will be assigned by the Department. This assignment is based on our understanding of mutual scholarly interests. A student may request a change of academic advisors at anytime; this request should be made in writing to the Graduate Academic Coordinator or Chair, and is readily granted if all parties involved agree to the proposed changes. Until a graduate student's full thesis committee is named during the Spring term of the first year of residency, the Department Graduate Academic Coordinator and the Department Chair will serve as default members of the committee and will be available to the graduate student for academic advising.

In preparation for the initial meeting with one's advisor to identify a tentative course schedule, each student is encouraged to fill out the Departmental curriculum form attached at the end of this document, listing EARS and collateral science courses one has completed in the past and the courses one proposes to take during the next two academic years. The student should consider what courses previously taken may be used to fulfill program prerequisites (and only prerequisites). These prerequisites are listed in detail below. Once completed and reviewed by the advisor, the student should submit this form to the Departmental Administrator. The Graduate Coordinator will review all courses taken elsewhere proposed to satisfy Dartmouth prerequisites and inform the student if any course is not considered acceptable.

- B. **Course requirements**—Graduate students must enroll for at least 3 academic credits per term. These credits may include EARS 141-143 (thesis research) and EARS 149 (supervised teaching). Note that EARS 142 is equivalent to two course credits and EARS 143 equivalent to three course credits. When enrolling in thesis research, students should choose only one of EARS 141-143. Thus a student taking a graduate seminar (e.g., EARS 201) and spending the rest of their time doing thesis research would enroll in EARS 201 and EARS 142. Similarly, a student doing full time thesis research need only enroll in EARS 143.

All first year graduate students are required to enroll in EARS 201, 202 and 203 in sequence, offered in fall, winter and spring terms each year, respectively. These courses provide an opportunity to build a spirit of collaboration among the members of an incoming cohort, as well as an introduction to regional geology and the development of critical professional skills including how to prepare scientific proposals and present results at a scientific meeting.

Otherwise, there is significant flexibility and available time for individual students to customize their own graduate training. In addition to departmental offerings, the EARS faculty recommends that students consider relevant courses in the Departments of Mathematics, Chemistry, and Physics, as well as in the Thayer School of Engineering. Course offerings from these Departments are described in the ORC and on respective Departmental websites.

Overall, foresight and prior thought are necessary when considering which Dartmouth courses to take: many upper-level courses eligible for graduate credit offered within the EARS Department and elsewhere on campus are normally offered only in alternate years. Thus, we suggest that each student develop a tentative graduate curriculum that spans two full years, at a minimum.

The EARS faculty recognize that there are many professionally-rewarding and research-relevant short courses and full-term courses offered elsewhere that can complement our own course offerings. The EARS faculty are willing, on a case-by-case basis, to provide financial support for costs associated with enrollment and travel in such off-campus courses, so that a student can make the most of his or her time in our program. A student's request for such support will include a written justification for a reasonable amount, and at least one letter of support from the student's primary advisor and members of the student's research committee.

- C. **Curriculum/Thesis Advisory Committee**—A student’s Curriculum/Thesis Advisory Committee comprises three faculty members available to consult on all matters relating to course selection, research, and dissertation preparation. The student and primary research advisor will choose the other members of this committee during their first year no later than the April 1st deadline. The composition of this committee may change as a student’s academic interests evolve. The primary advisor will play a major role in this group. Prior to the defense of your thesis the membership of your thesis committee must be approved by the Office of Graduate Studies. Additional information on this topic is provided in Section 21.

21. Requirements and guidelines for the M.S. degree

- A. **M.S. prerequisites**—To be considered for admission to the M.S. program a prospective student must have:

i) Completed an undergraduate science major with broad background in Earth Sciences, for which the coursework should have included the following:

ii) The equivalent of Dartmouth courses Math 3 and 8.

iii) The equivalent (or higher level) of any two of the following Dartmouth course sequences:

Chemistry 5 and 6; Physics 3 and 4 (or 13 and 14); Biology 11 and 16.

If a student is admitted into the MS program without having completed such courses, the student must fulfill these prerequisites in addition to the specific degree requirements described below.

- B. **Specific Departmental requirements**—In addition to satisfying the prerequisites discussed above, all EARS graduate students pursuing the M.S. degree must satisfy the following requirements and expectations:

i) **Successfully complete seven courses eligible for graduate credit** (EARS 100 and above) at the discretion of the thesis committee. These courses will include Earth Sciences 201, 202, and 203 and either EARS 117 or EARS 118. Courses not eligible for course credit toward a graduate degree include Departmental seminar (EARS 121), special project research (EARS 131), thesis research (EARS 141-143), and teaching (EARS 149).

ii) **Complete the equivalent of three terms (nine course credits) of thesis research** for registered credit (EARS 141-143). See Course Requirements in section 20 for additional details regarding EARS 141-143.

iii) **Submit names of thesis committee**. Additional information on committee membership is given in section 20, below.

iv) **Submit a thesis proposal.** The submitted thesis proposal must be signed by all members of one's committee, signifying their approval. This document should be prepared in close collaboration with one's research advisor. Examples of proposals from previous years are available for review.

v) It is expected that, at a minimum, a student will **meet with the Dartmouth members of his or her committee** once during the winter term of his or her 2nd year to give a 20-minute presentation on the progress of his or her research. After this presentation, the committee will discuss the student's progress and determine what is required to ensure that he or she maintains satisfactory progress. **It is the graduate student's responsibility to prepare a short summary of this meeting, and submit a copy, signed by student and his or her advisor, to the Departmental Administrator. In addition, it is the graduate student's responsibility to notify the Graduate Academic Coordinator by email of one's completion of this milestone.**

vi) **Complete a thesis of professional quality and pass a final oral defense of the thesis. A draft of the thesis is due to committee members at least two weeks prior to the scheduled defense.** No defense may be scheduled until: i) membership of the thesis committee is approved by the Office of Graduate Studies; ii) a degree completion form is approved by the graduate coordinator of the department.

vii) From the time that the thesis proposal is submitted up to and including the defense of the thesis, it is expected that the student will **maintain an updated summary of his or her research on the Departmental website.** This description must be approved by one's advisor at the time the thesis proposal is submitted, updated no later than the time of the 2nd-year committee meeting and presentation, and as an element of the thesis preparation and defense.

viii) **Each graduate student is expected to TA at least one course,** as opportunities arise and as one's research schedule allows. Each student's program will be arranged, according to his/her individual needs and interests, and the teaching needs of the Department. An essential element of graduate education at Dartmouth is the experience gained in teaching other students; this expectation acknowledges that aim. To fulfill this requirement, the student must be enrolled in EARS 149 during the term the students serves as a TA.

ix) **At least two copies of the thesis must be bound**—one for the Kresge Science Library and the other for the archives in Baker Library. Two additional copies—one for the M.S. recipient and one for his or her advisor—are also generally bound. Details on the required formatting of thesis are available at <http://graduate.dartmouth.edu/docs/thesisguidelinesupdate.pdf>. A student may have additional, personal copies bound through ACME Book Company. Additional information on this option can be reviewed at: www.acmebook.com.

22. Requirements and guidelines for the Ph.D. degree

A. **Ph.D. prerequisites**— To be considered for admission to the Ph.D. program a prospective student must have:

i) Completed an undergraduate science major with broad background in Earth Sciences, for which the coursework should have included the following:

ii) The equivalent of Dartmouth courses Math 3 and 8.

iii) The equivalent (or higher level) of any two of the following Dartmouth course sequences:

Chemistry 5 and 6; Physics 3 and 4 (or 13 and 14); Biology 11 and 16.

If a student is admitted into the Ph.D. program without having completed such courses, the student must fulfill these prerequisites in addition to the specific degree requirements described below.

B. **The specific requirements of the Department of Earth Sciences Ph.D. degree** are as follows. Specific deadlines for completing these requirements are given in the Summary of Key Deadlines at the beginning of this guidebook.

i) **Satisfactorily complete the following required courses or their equivalents**, if not already having done so prior to entering the Ph.D. Program.

a) EARS 107—Mathematical Modeling in the Earth Sciences

b) EARS 118—Advanced Methods for Environmental Data Analysis

c) MATH 23 – Differential equations. It is strongly suggested that Math 23 be completed in the first two years of one's Dartmouth coursework if not already completed by start of the graduate program. It is the responsibility of the student and his or her research committee to complete this requirement in a timely way, as well as to use the opportunities it affords to pursue further, advanced quantitative coursework as appropriate.

d) One upper-level science or Engineering course outside the Department eligible for graduate credit and **approved by the Department**. Such courses taken by EARS graduate students in the past have included Chemistry 51 or 71, Biology 26, Engineering 24 or 34.

iii). **Satisfactorily complete a minimum of six additional courses carrying graduate credit beyond the above required courses, for a total of nine graduate credits**. Courses not eligible for course credit towards a graduate degree include departmental seminar (EARS

121), special project research (EARS 131), thesis research (EARS 141-143), and teaching (EARS 149). Upper-level undergraduate courses are eligible for graduate credit by undertaking additional coursework assigned and evaluated at the discretion of the course instructor. It is up to the graduate student interested in taking such a course to approach the faculty instructor to establish the scope of additional work required.

iv) **Submit names of thesis committee.** Additional information on committee membership is given in section 23, below.

v) **Submit a summer project proposal.** The submitted project proposal must be signed by all members of one's committee, signifying their approval. This document should be prepared in close collaboration with one's research advisor. Examples of proposals from previous years are available for review.

vi) **Successfully pass a written qualifying exam set by the EARS faculty.** See section 23 for additional details on the qualifying exam.

vii) **Successfully present and defend the results from one's summer research project.** All members of one's summer research committee must be present at this exam. Additional information about scheduling and the nature of this defense is given below, in section 24.

viii) **Present and defend a thesis proposal before one's thesis proposal committee.** The thesis proposal committee is the same as the thesis committee with the addition of an outside examiner selected from eligible faculty outside of the Department. A draft of the thesis proposal is due to committee members at least two weeks prior to the scheduled defense. While recommended that the outside examiner be present at one's proposal defense, it is not required. Additional information about scheduling and the nature of this defense is given below, in section 21.

ix) **Submit a copy of his or her thesis proposal signed by the outside examiner.**

x) After the third year of one's Ph.D. research, it is expected that, at a minimum, a student will **meet with the Dartmouth members of his or her committee** once during the winter term of his or her 2nd year to give a 20-minute presentation on the progress of his or her research. After this presentation, the committee will discuss the student's progress and determine what is required to ensure that he or she maintains satisfactory progress. It is the graduate student's responsibility to prepare a short summary of this meeting and to provide a copy of this summary to the Departmental Administrator for the graduate student's file. This summary must be signed by the graduate student and his or her advisor.

xi) From the time that one's summer research proposal is submitted up to and including the defense of the thesis, it is expected that the student will **maintain an updated summary of his or her research on the Departmental website.** This summary must be approved by one's advisor and updated...

a) at the time that one's summer research proposal is submitted;

- b) at the time of the summer research defense;
- c) at the time of one's thesis proposal defense;
- d) during annual meetings with one's committee; and
- e) as part of the final thesis defense.

xii) **Each graduate student is expected to TA at least one course**, as opportunities arise and as one's research schedule allows. Each student's program will be arranged, according to his/her individual needs and interests, and the teaching needs of the Department. An essential element of graduate education at Dartmouth is the experience gained in teaching other students; this expectation acknowledges that aim. To fulfill this requirement, the student must be enrolled in EARS 149 during the term the student serves as a TA.

C. A candidate who has met the above requirements and expectations will receive a PhD degree after he or she has:

i) **Satisfactorily completed any additional courses** beyond those specified above, as prescribed by the Department and/or thesis committee.

ii) **Completed a thesis meeting the highest standards of professional scholarship**. The thesis may be a series of published (or at least publishable) papers linked by appropriate text. A near-final **draft of the thesis is due to the committee members at least two weeks prior to the scheduled defense**. No defense may be scheduled until: i) membership of the thesis committee is approved by the Office of Graduate Studies; ii) a degree completion form is approved by the graduate coordinator and chair of the department.

iii) **Pass a final oral defense of the thesis before the Thesis Committee**. All other members of the faculty are encouraged to attend this defense. The proposal defense will be preceded by a public oral presentation of the candidate's research, giving all faculty and students a chance to ask questions or offer comments.

iv) **Submit one signed copy of one's thesis to the Graduate Studies Office for editorial review**. Details on the required formatting of thesis are available at <http://graduate.dartmouth.edu/docs/thesisguidelinesupdate.pdf>. Pending editorial approval of one's thesis by the Graduate Studies Office, the Ph.D. **candidate will upload the final version of his or her thesis to UMI** using the guidelines at the following website:

<http://dissertations.umi.com/dartmouth/>

One can also access the UMI website through the Graduate Studies Homepage:

www.Dartmouth.edu/artsci/gradst/thesis.shtml

v) **Optional bound copies**—Directions for obtaining personal bound copies of the thesis are given when the thesis is uploaded. A credit card must be used. If the student has research funds left, they can put in for reimbursement of the extra copies

23. Thesis and exam committee membership

- A. Guidelines for the composition of one's thesis committee are given in the Graduate Student Handbook from the Office of Graduate Studies. Final approval of any thesis defense committee rests with the Dean of Graduate Studies. To this end, **prior to scheduling the defense of one's thesis** for either M.S. or Ph.D. degrees, the degree candidate must submit the names of the members of the thesis defense committee for approval by the Dean of Graduate Studies. The candidate must include with the names of the committee members:
- i) A short paragraph describing the qualifications of any non-Dartmouth full-time faculty members of the committee, including a paragraph describing the qualifications of the external member of the Ph.D. defense committee;
 - ii) a current C.V. for any non-Dartmouth full-time faculty members of the committee, including the external member of the Ph.D. committee;
 - iii) the title of the thesis, and
 - iv) the date and time of the defense.
- B. **The M.S. examination committee** generally consists of three faculty members from the EARS Department (including the dissertation advisor). One of the three may be, but is not required to be, from outside the Department. With approval from the Graduate Dean, the third internal member of the thesis committee may be an emeritus faculty member, research faculty member, or other similar Ph.D.-level member of the Dartmouth community.
- C. **The Ph.D. examination committee** consists of a minimum of three full-time Dartmouth faculty members of which a minimum of two must be from EARS Department (including the dissertation advisor) as well as an external member with a faculty-equivalent appointment outside of Dartmouth. With approval from the Graduate Dean, the third internal member of the thesis committee may be an emeritus faculty member, research faculty member, or other similar Ph.D.-level member of the Dartmouth community. With approval from the Graduate Dean, the external committee member may be a staff scientist at a research facility (e.g., USGS, CRREL, NASA). In these cases, the external committee member should have a demonstrated record of active and on-going in peer-reviewed research and should be uniquely qualified to critique the student's work. The external member may participate in meetings in person or via video conference.

24. Qualifying exams and dissertation defenses in the M.S. and Ph.D. programs

- A. **Scheduling**—The Summer Research Defense (Ph.D.), the Dissertation Proposal Defense (Ph.D.), and final Dissertation defenses (both M.S. and Ph.D.) should be scheduled at times when a maximum of members of the Department can attend. Students and advisors should work together to coordinate all examinations and defenses during a term, to assure best-possible attendance and Departmental faculty participation.

Before you can schedule your final dissertation defense, first be sure you have had your committee approved by Graduate Studies. The appropriate form is available from the Departmental Administrator or Graduate Coordinator. You then must make sure you have met all of your degree requirements. In order to do this, you will need to meet with the Graduate Coordinator to review your academic record.

Once it is determined that you have met all the degree requirements, the Graduate Coordinator will then sign a form called the Degree Certification form. You will need to show this signed form to the Departmental Administrator and only then will you be able to schedule a date to defend.

After you defend and are ready to turn in your thesis, you must have the Degree Certification form signed by the Earth Sciences Chair and give a signed copy to the Departmental Administrator for your file. The original version of this form is to be submitted to the Graduate Studies Office along with the number of required copies of your thesis.

Please note: Once the Graduate Coordinator signs the Degree Certification form and you show it to Departmental Administrator to schedule your defense, you must carefully hold onto this form until after your defense for chair signature.

B. Written qualifying exam for Ph.D. candidates—During the first reading day of fall term of the second year of residence Ph.D. candidates must pass a written qualifying exam. Questions on the exam are structured around a slightly modified version of the "Big Ideas" that form the core of the Earth Science Literacy framework (www.earthscienceliteracy.org). The Earth Science Literacy Initiative is a community-based effort to identify the underlying principles and ideas of earth science across a wide variety of research fields, including geobiology and low-temperature geochemistry, geomorphology, geophysics, hydrologic sciences, mineralogy and petrology, sedimentology, and tectonics.

The exam is composed of ten questions randomly selected from the list of questions, more or less equally divided across the Earth Science Literacy categories. Candidates are required to answer six of the ten questions. No question requires more than a few pages to answer. Candidates will have access to a computer for the exam for use in calculations and writing, but it will not be connected to the internet. The exam is given annually at 9 am on the first reading day of fall term. The exam must be completed by 5 pm that day.

There are a variety of question styles. Some are conceptual, other focused. The initials after each question indicate the author of the question. Candidates may discuss each question with the question's author prior to the exam.

C. Summer-research defense and oral exam of Ph.D. candidates—The candidate will arrange to present and defend his or her summer research results before the summer research committee. The candidate must pass the written qualifying exam prior to scheduling the summer-research defense.

Any candidate who does not successfully pass the summer-research defense by March 31st of his or her second year, unless there are extenuating circumstances, will be dismissed from the Ph.D. program, and admitted to the M.S. program.

The summer-research defense will be preceded by a public oral presentation *of the background, aims, methods, results, and conclusions* from the candidate's summer research. After the presentation, all faculty and students will be given a chance to ask questions or offer comments. Only the candidate, members of the summer research committee, the general examiner, and any member of the faculty may be present during the defense which immediately follows the public presentation. During the defense, the candidate's approach to research will be scrutinized for its significance, timeliness, logical coherence, and optimization of research approaches. Please note that the purpose of this exercise is for the Ph.D. candidate to successfully demonstrate to the faculty that he or she can propose, design, execute and report on a 'stand-alone' research project worthy of the highest standards in scholarship.

At the conclusion of the summer-research defense, the summer research committee will evaluate the student's performance and preparation to pursue Ph.D. degree in the following terms:

- i) unconditionally invite the candidate to write and defend a Ph.D. thesis proposal;
- ii) conditionally invite the candidate to write and defend a Ph.D. thesis proposal after completion of remedial action(s);
- iii) invite the candidate to re-defend his or her research and/or take the oral exam at a later date; this option will only be made available during the first defense and exam;
- iv) accept the student into the M.S. program.

In the case of a conditional pass (option ii, above), which is assigned if, in the committee's view, the candidate fails to adequately defend the results from his/her summer research or lacks preparation in certain areas of his/her Earth science background, the committee will advise remedial action. Such action may include the candidate's completion of additional courses, directed reading with a faculty member, assigned teaching assistantships, or additional research. It is the candidate's responsibility to assure that any deficiencies are made up expeditiously. **The candidate may not defend a thesis proposal until all recommended remedial actions are complete.**

In the event of option iv, above, or in the event that a Ph.D. candidate fails to schedule and satisfactorily pass his or her summer-research defense by the appointed deadline, the candidate will be admitted into the M.S. program. In this event, and given successful completion of one's M.S., the student must re-apply to the Ph.D. program if he/she wishes to continue to pursue a Ph.D. degree.

- E. **Dissertation Proposal Defense**—A draft of one’s proposal for Ph.D. research must be submitted to the members of one’s Thesis Committee at least two weeks prior to the proposal defense. The defense of the thesis proposal will be evaluated in terms of PASS, CONDITIONAL PASS, or FAIL.

In case of a conditional pass, which will be assigned if the candidate lacks preparation in certain areas of his/her Earth science background, the committee will advise remedial action. Such action may include taking of additional courses, directed reading with a faculty member, assigned teaching assistantships, or additional research. It is the candidate's responsibility to assure that any deficiencies are made up expeditiously.

If the proposal defense is failed, the candidate may be given an opportunity to re-take it during the next academic term. Two successive failures, or an exceptionally poor performance in the first proposal defense, will automatically result in dismissal of the candidate from the Ph.D. program. At the discretion of the thesis committee, the student may be admitted into the M.S. program.

If a Ph.D. candidate has not defended his or her thesis proposal by December 15th of his or her third year, progress in the program will be considered unsatisfactory and the candidate’s funding will be revoked, and/or they may be dismissed from the Ph.D. program. At the discretion of the thesis committee, the student may be admitted into the M.S. program.

25. M.S. students seeking to continue on and pursue the EARS Ph.D. degree

An EARS student currently enrolled in the M.S. program who wishes to continue toward the Ph.D. degree should proceed as follows:

- A. Notify the faculty of his or her plan promptly and in writing, outlining research interests. Early notification will facilitate the development of a coherent M.S.- Ph.D. program.
- B. Apply formally to be admitted to the EARS Ph.D. program by completing the standard graduate application form. The application should provide a statement of intent for the PhD. The applicant should make sure to provide an updated transcript and, if necessary, updated letters of recommendation and GRE scores.
- C. The student must complete all the regular Ph.D. degree requirements within the regular time-frame that begins upon matriculation to the Ph.D. program. However, students may opt to complete some of the degree requirements at an earlier date (e.g., to take the Ph.D. qualifying exam during the fall term of their first year). Also, with the approval of their Ph.D. committee, a student continuing on to a Ph.D. degree may use EARS 141-143 to count toward the nine graduate credits required of the Ph.D. degree.
- D. In keeping with the general policy of not double-counting courses, if the student completes the M.S. degree, any course used to fulfill the M.S. degree requirements may not count toward the Ph.D. course requirements. For example, if the student took EARS 201 to satisfy

M.S. degree requirements, it may not count toward fulfilling the Ph.D. requirements (although the student need not retake the course for the Ph.D.).

26. General thesis research-related expenses:

A. The Department has several sources of funds for graduate research: grants garnered by professors; grants garnered by students; and Departmental funds. First and foremost we rely on external sources of funds (grants) to support our research. Departmental funds should be viewed primarily as backup if grant applications fail, or as seed money when not enough work has yet been done to justify writing of a grant. That said, the Department has traditionally made funds available during a student's graduate program. With no guarantee that such funding will continue in the future, the current schedule of funding is as follows:

- | | |
|---|-----------------------|
| i) M.S. Thesis Research: | \$2,000.00 |
| ii) Ph.D. Summer Research: | \$1,000.00 |
| iii) Ph.D. Thesis Research: | \$2,000.00 |
| iv) Professional meeting at which student presents: | up to \$750.00 (once) |

B. The following guidelines strictly apply to this funding schedule:

i) An estimate of the full budget for thesis research, with brief justification, should be submitted to the Department at the time any research project is formally proposed. This includes proposals for research pursued in partial satisfaction of requirements for the M.S. or Ph.D. degrees. The budget should contain all expected research expenses, including cost for the use of outside or departmental instruments.

ii) Research expenses should be charged to one's advisor's grant if it is appropriate to do so under the terms of the grant as interpreted by principal investigator holding the grant award.

iii) We expect that students will apply to outside funding agencies before asking the Department for research support beyond the schedule identified above.

iv) For students whose research costs are not covered by outside grants, or who have not yet received a response from the granting agencies, the Department will make every effort to cover expenses associated with thesis-related research, but we can make no guarantee that this will be the case. Requests to the Department for funds should include a brief rationale for the request, a list of the outside funding agencies approached, any results, positive or negative and the Departmental Funding Form (attached).

v) If outside support is obtained after the Department agreed to provide funding, the Department should be reimbursed for all expenses already made which would be covered by the grant. This policy helps to preserve Departmental funds for otherwise worthy projects for

which efforts to obtain outside support fail, and which could not be carried through in the absence of Departmental funds.

vi) The Department does not cover outside costs relating to thesis preparation such as typing, photography, paper, duplication of figures and maps, bindery charges, etc.

vii) Summer and Thesis Research funds may not be used to attend professional meetings or field trips.

viii) The Department strongly encourages students to present their research at one or more professional meetings. The conditions to be met for a student to obtain College or Departmental support for attending his or her first professional meeting include that the student be presenting research conducted as part of his or her Dartmouth degree requirements. If this is the case, students are generally encouraged to first apply for a Graduate Student Travel Award (GSTA) from the Office of Graduate Studies. **Note that the request for a GSTA must be made prior to attending the meeting.**

Departmental support may be used to supplement the GSTA to pay for the full cost of attending a single meeting. To the degree that funds allow, Departmental support can also be used to attend a second professional meeting. Students should consult with their advisor concerning funding and other issues prior to submitting an abstract to any professional meeting.

Securing support for attending additional meetings is normally the responsibility of the student and/or advisor. Most professional societies offer student travel awards and students are encouraged to explore these options. In exceptional cases, a student may apply to the Department for additional travel support. Additional funds will only be considered if:

a) the student applies for additional funding in writing to the Department Chair **before** any commitment is made to attend the meeting, and

b) the request is accompanied by a written explanation from the advisor indicating the significance of the student's contribution to the meeting presentation and attesting to the lack of funding from alternative sources.

Attached:

Funding Form

Form (M.S. and Ph.D.) for yearly review

Course Plan Worksheet

Money Received other than Stipend and Tuition

Name: _____ degree sought: _____

A. Monies received from the EARS Department:

i) For thesis research (do not include support drawn from externally awarded grants):

Date: Amount

ii) For other than research (attending conferences, field trips, etc.):

Date: Amount

B. Monies received from outside the EARS Department

i) For thesis research:

Source Amount

ii) For other than research (attending conferences, field trips, etc.):

Source Amount

**EARS M.S. Degree
Prerequisites and Requirements**

Below are the specific requirements for the M.S. degree in Earth Sciences at Dartmouth. This form must be completed to the best of your knowledge and submitted to the Graduate Coordinator upon your arrival at Dartmouth and before the fall term officially begins.

1) Prerequisites

a) Complete an undergraduate science major with broad background in Earth Sciences (attach copy of courses taken in Earth Sciences, Math, Chemistry, Physics, Biology). Your coursework should have included the following courses:

<u>course</u>	<u>date to be taken</u>	<u>fulfilled</u>
b) Math 3 (or equivalent)	_____	_____
c) Math 8 (or equivalent)	_____	_____

d) **Two** of the following college-level, 2-course introductory sequences or equivalent:

<u>course sequence</u>	<u>date to be taken</u>	<u>fulfilled</u>
<u>Chemistry 5 and 6 (or equivalent)</u>		

<u>Physics 3 and 4 (or equivalent)</u>		

<u>Biology 11 and 16 (or equivalent)</u>		

Note: Any student lacking prerequisites a-d listed above will be required to complete them in addition to completing the degree requirements below.

2) Requirements

a) Completion of **three** courses eligible for graduate credit—numbered 100 and above—in addition to required courses EARS 201, 202, 203, and either EARS 117 or EARS 118.

<u>course</u>	<u>date to be taken</u>	<u>fulfilled</u>
EARS 117/118	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

- b) Complete 4 terms of thesis research
- c) Submit title and names of thesis-committee members by April 1st
- d) Submit a detailed proposal, which includes a budget, for your thesis research signed and approved by each committee member by June 15th.

- e) Complete a thesis that meets the highest standards of academic scholarship and pass a final oral examination on the topic of the thesis by the end of your second year.

**EARS Ph.D. Degree
Prerequisites and Requirements**

Below are the specific requirements for the Ph.D. degree in Earth Sciences at Dartmouth. This form must be completed to the best of your knowledge and submitted to the Graduate Coordinator upon your arrival at Dartmouth and before the fall term officially begins.

1) Prerequisites

a) Complete an undergraduate science major with broad background in Earth Sciences (attach copy of courses taken in Earth Sciences, Math, Chemistry, Physics, Biology). Your coursework should have included the following courses:

<u>course</u>	<u>date to be taken</u>	<u>fulfilled</u>
b) Math 3 (or equivalent)	_____	_____
c) Math 8 (or equivalent)	_____	_____
d) Math 23 (or equivalent)	_____	_____

e) **Two** of the following college-level, 2-course introductory sequences or equivalent:

<u>course sequence</u>	<u>date to be taken</u>	<u>fulfilled</u>
<u>Chemistry 5 and 6 (or equivalent)</u>		

<u>Physics 3 and 4 (or equivalent)</u>		

<u>Biology 11 and 16 (or equivalent)</u>		

Note: Any student lacking prerequisites a-d listed above will be required to complete them in addition to completing the degree requirements below.

2) Requirements

a) Completion of **six** courses eligible for graduate credit—numbered 100 and above—in addition to required courses EARS 107, 118, 201, 202, & 203.

<u>course</u>	<u>date to be taken</u>	<u>fulfilled</u>
<u>EARS 107</u>	_____	_____
<u>EARS 118</u>	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

b) One Department-approved, upper-level science or engineering course outside Department carrying graduate credit:

<u>course</u>	<u>date to be taken</u>	<u>fulfilled</u>
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2) Ph.D. Requirements (cont'd)

- c) Submit title of your summer research project and names of summer-research and exam committee members by April 1st of your first year in residence.
- d) Submit a signed proposal for your summer research project by June 15th of your first year in residence.
- e) Pass a written qualifying exam by Dec. 15th of your second year of residence.
- e) Pass a defense of results from a summer research project by Feb 1st of your second year in residence.
- f) Present and defend a thesis proposal before the faculty by Dec 15th of your third year in residence.
- g) Fill teaching assistantship duties at least one term, as opportunities and individual research schedules permit.

If you have satisfied the above requirements and expectations, a Ph.D. degree will be awarded to you after you have additionally:

- h) Met with and satisfied your thesis committee regarding suitable research progress on (at least) an annual basis.
- i) Satisfactorily completed any additional graduate-level courses required by your thesis committee or the Departmental faculty.
- j) Completed a thesis of the highest academic standards, and passed a final oral examination on the topic of the thesis, to the satisfaction of your thesis committee.

TWO-YEAR COURSE PLAN WORKSHEET

Academic year _____

Summer

Fall

Winter

Spring

Academic year _____

Summer

Fall

Winter

Spring

Date prepared: _____