Earth,

Atmospheric

and

Planetary Sciences

Graduate Student Handbook

May, 2017

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INTRODUCTION

Welcome to the Department of Earth, Atmospheric, and Planetary Sciences [EAPS]. This handbook is a compilation of information gathered from practical experience, summarized from department documents, collected from MIT's website, and published elsewhere, when credited. The Academic Issues section contains the official requirements for the graduate program in EAPS. Much of the information in this handbook will also be relevant to students in the MIT/WHOI Joint Program (JP), but the requirements for the graduate programs in the MIT/WHOI JP are published separately.

ADMINISTRATIVE ISSUES

EAPS FACILITIES

EAPS is principally housed in Building 54, the Green Building, but Building E25 has additional research labs and offices for faculty and graduate students. The Joint Program on the Science and Policy of Global Change has offices in E19. Video conferencing facilities are available in Building 54. Also connected to the Department are the Wallace Astrophysical and Geophysical Observatories, located in Westford, Massachusetts.

HEADQUARTER'S SERVICES

Allison Provaire [provaire@mit.edu]
Administrative Assistant to Department Head
Appointments with Department Head
Reservations for 54-915/923

Brandon Milardo [bmilardo@mit.edu]
Administrative Assistant to Administrative Officer
Departmental Mail
Parking – This issue is not handled within the department for students. To find he rules relating to keeping a car on campus, parking options, costs, and other information for students, see:
http://web.mit.edu/facilities/transportation/parking/student/index.html Audio-Visual Equipment (also Education Office)

Report Problems with 54-811 Color Copier/Printer and large-format plotter

Reservations for the Department van: drivers must be registered on the department insurance policy

Report any general building issues (i.e. heating & ventilation, elevator problems, water leaks)

Teaching Supplies (also Education Office)

GRADUATE STUDENT SUPPORT

All students admitted to the EAPS doctoral or MIT/WHOI programs are admitted with full support that includes a stipend, health insurance, and full tuition. This support covers the full academic year and continues as long as the student is making satisfactory progress toward the degree. The specifics of the funding provided by the Joint Program vary from that in the EAPS program. The section below applies to the EAPS program; JP students are advised to consult documentation from WHOI for the relevant details of JP funding.

Funding for graduate students is structured as fellowships, research assistantships, and teaching assistantships. Each type of award can be made on a fractional basis so that, in combination, the total award for a student meets the tuition and stipend levels set by the department in accordance with the guidelines published by the Office of the Provost. The EAPS doctoral program spans five years and support beyond that time is not automatic.

Continued support must be approved by the Committee on the Education Program (CEP), and will only be granted if the student and advisor can explain the circumstances that require an extension, demonstrate that the student has been making satisfactory progress to date, and has a reasonable expectation of finishing in the near future.

A full-time appointment for one regular term as a Research Assistant (RA) or Teaching Assistant (TA) extends for a period of 4.5 months. Fall term appointments begin on September 1 and end on January 15. Spring term appointments begin on January 16 and end on May 31. Summer research appointments begin June 1 and end August 31. Both RA and TA appointments carry salaries and associated responsibility either to MIT or to a particular research grant or contract.

(1) Assistants observe normal Institute holidays (generally coinciding with national holidays). Periods when classes are not in session, such as IAP and Spring Vacation, are not Institute holidays and assistants are expected to work during these times. During a twelve-month

appointment, an Assistant is entitled to a paid two-week vacation, arranged with the approval of the research supervisor.

(2) Absence from the Institute during a working period requires approval of the student's supervisor.

Research Assistantships (RA)

This is the most common type of support for EAPS graduate students. Prior to the student's taking the General Exam, the research advisor usually provides funding using this type of award. After the General Exam, the thesis advisor most commonly provides the student's funding. Often the academic advisor becomes the thesis advisor. A time commitment of 20 hours per week is required for a full-time appointment. When you are supported by a research grant, you should clearly discuss with your advisor his/her expectations for your performance in completing the assigned work. . Normally, a RA should be registered for about 36 units of subjects, which may include thesis (12.ThG) or "Current Research" courses.

Teaching Assistantships (TA)

EAPS recognizes that working as a teaching assistant is valuable for a graduate student, and graduate students are advised to work at least one term as a TA. Indeed, we find that some of our best students thrive as Teaching Assistants. We use teaching assistants for both undergraduate and graduate classes during both terms as well as for some classes during the Independent Activity Period (IAP). Students holding a Teaching Assistantship share a responsibility for promoting the scholarly and educational objectives of the department.

The particular obligations of an individual TA are to be decided by the faculty member in charge of the subject being taught. A Teaching Assistant in the department is expected to put in 20 hours per week, on average, although the temporal distribution of work may be highly non-uniform. Instruction in EAPS subjects takes a variety of forms, such as fieldwork at remote locations or astronomical observing during night hours. The faculty member in charge of the subject is responsible for arranging with the TA in advance how work will be scheduled so that, to the extent practicable, the TA's instructional duties may be meshed with other responsibilities as a student.

Normally, a TA should be registered for about 36 units of subjects, which may include thesis (12.ThG) or "Current Research" courses. Teaching Assistants also should register for

one unit of credit in 12.446 Teaching Experience in EAPS. The class currently serves as a formal way to document a student's experience as a Teaching Assistant in a regular term class. Having documentation of past teaching often has proven to be important to alumni/ae when responding to job announcements.

Most commonly, a student is asked to fill the role of teaching assistant for a specific class, and he/she has the option of agreeing or not. It might happen, however, that a student is assigned to a teaching assistantship without being given the option of refusing the assignment. If the student is concerned about this assignment, for instance if it interferes with preparation for the general exam or thesis research/preparation, the student may appeal the assignment to the Associate Department Head.

Fellowships (FE)

Some students are supported by a fellowship. While fellowship holders have no official commitment to a particular research project, we strongly encourage them to become involved with a research project early in their graduate career. Normally, a FE holder should be registered for about 36 units of subjects, which may include thesis (12.ThG) or "Current Research" courses.

In general, the responsibility of a graduate fellow is to be determined by consultation between the student and the student's research and academic advisors. It is the responsibility of the student to keep the faculty advisors informed of his or her whereabouts and approximate working schedule through the period of the appointment.

Some EAPS students are funded by fellowships awarded from external agencies, organizations, or governments. When an external fellowship does not meet the funding guidelines established by MIT, it is supplemented to achieve full tuition and to raise the stipend to the level of an assistantship by an additional appointment, usually a research assistantship. Occasionally a teaching assistantship is used, by request, to supplement the fellowship, but the policy is to minimize this situation so that time on fellowship can be characterized by concentration on research.

This supplemental award often carries the additional complication that not all of the tuition supplement can be directly credited to the student's account. In order to comply with the IRS's Revenue Notice 87-31 Reasonable Compensation Tax Law, MIT requires that a supplemental RA or TA appointment have a 36(stipend)/64(tuition) ratio, the proportional

allocation of a standard full-time appointment, regardless of the actual stipend/tuition ratio of the fellowship shortfall. This means that some of the tuition shortfall is actually paid to the student as a stipend rather than being credited to the student's bill. The student must then pay the remaining tuition balance using the overpayment of the stipend.

The amount of stipend overpayment is taxable income. Consequently, MIT increases the stipend to take into account the additional taxes that will be owed by the student. MIT is well aware that the financial situation of each student is different, but they must set the estimated tax at a level most relevant to the majority of the graduate students, that they are full-time students without other sources of income.

Any student needing to pay a tuition balance because of a fellowship shortfall will be informed of the amount of the payment by a note at the bottom of email notifying them of his/her RA/TA award. A Student Financial Services account specialist will work with each individual to make a payment schedule and installments that work for his/her needs. The account specialist will also adjust late fees if applicable, and "shelter" the account, to avoid future late fees. Typically, tuition payments are due on the 1st of each month, starting with 10/1/20xx, and tuition should be paid in full by 5/1/20xx+1. Rent and other charges may also show up on your account, and these payments should be made separately from your tuition payments.

Administration of Awards

The Education Office enters the information on graduate student funding that is provided by each advisor into the Student Information System prior to each term. When each appointment is entered, an email with the details is sent to the student. It is the student's responsibility to check and understand the financial terms of the appointment. In addition, the student should check the stipend they receive in each paycheck to be certain it matches the amount expected from the original award notification. ePaystubs and other payroll information can be found under Payroll Forms and Services in the "for Students" section of WEBSIS, student.mit.edu. Report any problems or questions to the Education Office.

MIT pays graduate student stipends monthly on the last business day. Taxes are withheld for assistantships but not, in general, for fellowships. The Office of the Dean for Graduate Education holds yearly tax information sessions for domestic and international students at the beginning of each calendar year. You should watch for email notices of the scheduled

times. Finally, MIT has implemented a maternity leave policy for women who give birth while in a graduate program. Please see Appendix F at the end of this document for the details of the policy.

INSTITUTE CALENDAR

When considering financial or academic matters, you need to know the definition of the appropriate cycle. MIT has defined the following time periods:

Summer Term	June 1 – August 31
Fall Term	September 1 – January 15
Spring Term	January 16 – May 31

The academic year begins with the fall term and continues through the summer term.

The financial aid year begins with the summer term and continues through the spring term. The fiscal year begins July 1. The end of classes in the fall term is separated from the beginning of classes in the spring term by a one-month period called the Independent Activities Period [IAP]. During this time, the MIT community participates in special credit and non-credit classes and activities. EAPS uses this time to schedule various field trips associated with our classes.

Dates for important academic deadlines are published on the official Academic Calendar, and it is available on the Registrar's Office website. The MIT Bulletin is published annually at the beginning of the academic year, and an on-line version is available through the link at:

<http://student.mit.edu/>.

GRADUATE STUDENT LIFE

STUDENT ORGANIZATIONS

Graduate School Council [GSC]

"The Graduate Student Council (GSC) consists of elected representatives from academic departments and graduate living groups. The GSC is primarily concerned with promoting the general welfare and concerns for the graduate student body, and communicating with the MIT faculty and administration on their behalf. The GSC also sponsors many social,

cultural, and athletic events throughout the entire year to help improve the quality of life for graduate students."

http://gsc.mit.edu/

EAPS Graduate Student Advisory Council [EGSAC]

General Description – All EAPS graduate students are members of EGSAC. Business meetings are held periodically and officers are elected annually. EGSAC organizes social events throughout the year for graduate students, including the weekly Peer Hour, the annual fall trip, intramural sports, and a number of barbeque events and picnics. More information can be found at their website: http://www-eaps.mit.edu/egsac/index.html.

In a more serious vein, the organization elects the department representative(s) to the GSC. EGSAC has been effective in representing graduate student concerns to the faculty.

Mentoring Program - In the spring of 2003, EGSAC started a mentoring program in which post-generals graduate students volunteer to mentor incoming graduate students and continuing pre-generals graduate students. This is on a purely voluntary basis, and one post-generals student may be a mentor to more than one pre-generals student if they are willing, depending on how the numbers work out.

The mentoring might involve meeting once a month for lunch or coffee to talk about how things are going. This is just a general guide to the level of involvement and the precise relationship should depend on what the two students feel is necessary. , The amount of contact will vary depending on whether or not the younger grad student is passing through a difficult stage, such as choosing an advisor or preparing for the general exam. There should be a general feeling that the older student is looking out for the welfare of the younger.

This is basically designed to help students with anything other than their homework. That is, the mentor is not supposed to be a tutor but rather someone the mentee could talk to if they have difficulty with things like:

- knowing how to choose an advisor
- communicating with the advisor
- communicating with fellow grad students
- preparing for the general exam or thesis proposal

- feeling isolated
- knowing how to go about choosing a generals project or thesis topic
- wanting to switch advisors or projects, or wondering if this would be OK
- being harassed or discriminated against
- worrying about being capable of completing a PhD

Nor is the mentor a substitute for the advisor. The mentor should keep an eye on how the new graduate student is doing and suggest other resources or people to talk to if the mentee seems to be having problems. For example, a mentor could help identify a situation where a grad student is blaming him/herself for problems that actually come partly from a lack of advising.

Most new grad students start to talk to post-generals graduate students on their own anyway but that's difficult for some people, or at least takes time for most people. This mentoring program is supposed to prevent new graduate students from slipping through the cracks and floundering while no one notices.

STUDENT RESEARCH FUND [SRF] -- HOUGHTON FUND

EAPS encourages graduate student initiative in designing and implementing research activities. Attendance at disciplinary meetings and conferences is an important avenue for reporting research results. The Student Research Fund is available to help students conduct research on special projects in cases when other means of department or faculty support are not available. A request for proposals is sent out twice a year, at the beginnings of the fall and spring terms. The funds are awarded by the SRF Committee on the basis of need and merit of the project and are usually in the range of $200 -$800, but higher amounts will be considered. The Committee has a fixed amount of money it can distribute over the academic year. Proposals may include the fee for conference or meeting attendance, travel, or equipment. All students have access to the SRF, but students in the Program of Atmospheres, Oceans, and Climate (PAOC) should apply first to the Houghton Fund. Information about the Houghton Fund can be found at https://paocweb.mit.edu/education/resources/houghton-fund.

EAPS EVENTS

Daily - Cookie Hour, 3pm, 923

Weekly Events (Check event calendar on the EAPS website for schedules)

- Department Lecture Series
- Individual Research Group meetings, schedule varies with discipline
- The PAOC Colloquium (Mondays at noon)
- MIT Atmospheric Sciences Seminar Series [MASS]
- Oceanography and Climate Sack Lunch Seminars Series [SLS]
- Chemical Oceanography, Geology, Geochemistry, and Geobiology Seminar [COG3] [E25 Seminar]
- Earth Resources Laboratory / Geophysics Friday Informal Seminar Hour [FISH Seminar]
- Planetary Lunch Colloquium Series [PlCS]

Fall Semester Events

- Department Field Trip to Western Massachusetts
- PAOC Retreat
- Graduate Student Weekend at Long Pond
- Holiday Party
- EAPS at Fall Meeting of the American Geophysical Union [AGU]; evening reception for alumni / ae
- John H. Carlson Lecture [Lorenz Center]

Spring Semester Events

- Henry W. Kendall Lecture
- William F Brace Lecture
- Presentations of Senior Thesis Research
- Student Awards Dinner
- Reception for graduates and guests on Commencement Day

LAB and BUILDING SAFETY

Environmental Health and Safety for the department is administered by the EH&S Office located at N52-496. Day to day activities are managed by the department EH&S Coordinator in conjunction with Laboratory Safety Representatives. Lab Safety Representatives are lab personnel charged with the responsibility of interfacing with the Coordinator on behalf of the lab.

The EH&S Coordinator for EAPS is responsible for overseeing daily safety issues within

the department and acting as a liaison between EAPS and the EH&S Office. Other responsibilities of the Coordinator include providing advice and assistance with various EH&S matter, administering the laboratory inspection program, providing training, investigating accidents and maintaining records for the department.

The EH&S Coordinator for the Department of EAPS is:

Brian Smite
bsmith@mit.edu
617-253-6238
66-471

You may be required by law or because of MIT's policies and recognized best practices to be trained in certain aspects of Environmental Health and Safety. For example, those whose work involves the use of hazardous chemicals will be required to complete chemical hygiene and hazardous waste training, read the department Chemical Hygiene Plan, and sign the department Chemical Hygiene Clearance form. Chemical hygiene and managing hazardous waste training, along with a wide array of other courses, are offered by the EH&S Office, both online and classroom based. The EH&S Coordinator can help you to determine which courses you may need, and supply you with a copy of the Chemical Hygiene Plan and the clearance form. More information is available through the EH&S Office's web site at http://ehs.mit.edu/site/ or by calling the EH&S Coordinator.

You should be aware of issues of personal safety and theft. Building 54 is a particularly difficult building in which to restrict access. The building houses an Institute classroom used many evenings and weekends, so unfamiliar persons enter and exit beyond the normal working hours. Please do not prop the outside door open. If you cannot access the building at night or on weekends, contact the Education Office. When a lab or office is left unattended, you should close and lock the door. If you lock yourself out of your office during business hours please see one of the staff members in Headquarters. They can let you in. Outside of business hours you should call the MIT Police.

In all buildings, you should exercise common sense about your surroundings. The MIT Police can be reached at 253-1212 on any phone or, in emergencies, by dialing "100" from a campus phone. We recommend that you add the phone number to the contacts list on your cell phone.

ACADEMIC ISSUES

The graduate program in EAPS includes (at least) three modes of learning: formal coursework, seminars, and research. Each is an integral part of graduate education. Over the years, we have adopted a set of procedures and regulations to ensure that each student demonstrates excellence in all three areas. This section provides students and faculty with the departmental regulations and timetables for the completion of graduate requirements. The Joint Program with WHOI (JP) is supervised by faculty at both MIT and WHOI and is somewhat different in its requirements; therefore, we advise that students enrolled in the JP consult the manuals prepared by the various JP sub-disciplinary committees.

GRADUATE PROGRAMS

Students are accepted into one of the four education programs that constitute EAPS— the Program in Atmospheres, Oceans, and Climate (PAOC); the Program in Geology, Geochemistry, and Geobiology (PGGG), the Program in Geophysics (PG), and the Program in Planetary Science (PPS)—but they can take classes and engage in research across EAPS (and the Institute). Students may pursue graduate study in one of three degree options:

1. The 5th Year Master's Program -- Combined B.S./M.S. Program: Usually, MIT undergraduates can complete this program by adding one year of graduate study to their undergraduate degree program. Undergraduate majors must formally apply to the Master's program in order to pursue this option. All requirements for both degrees must be completed as described in the MIT Bulletin but a combined B.S./M.S. thesis is acceptable.

2. The Master of Science. Program: This degree typically requires a full year of formal subjects and one year of thesis research, including summer. To receive a M.S. degree a student must complete 66 units of graduate subjects (42 units must be "H" level) and a thesis.

3. The Doctoral Program: The Ph.D. degree usually requires three or four terms of formal subjects, followed immediately by the General Examination. Upon successful and unconditional completion of the General Exam, the student is expected to

devote two to three years to original research, the writing of a dissertation, and the completion of a successful defense of the dissertation. Students are expected to finish the entire program in five years.

Details on Institute policy relating to graduate students can be found in the annual MIT Bulletin and, particularly, the MIT Graduate School Policies and Procedures, available on-line at: < http://odge.mit.edu/gpp/>

ROLES & RESPONSIBILITIES IN GRADUATE STUDENT ADVISING

The responsibility for teaching and supervising student research lies directly with faculty advisors, although each student is ultimately responsible for ensuring that he or she progresses through the graduate program in a timely fashion. Oversight of graduate programs occurs on multiple levels, both within EAPS and MIT. The membership of the committees within EAPS is published each year and can be found online at: https://eapsweb.mit.edu/about/committees

Research and Academic Advisors

Students admitted to the doctoral and master's programs are assigned a faculty advisor based on the convergence of the research interests of both the advisor and the student. The advisor's primary responsibility is to guide the academic program of the student and serve as research supervisor, often supporting the student as a Research Assistant. Usually, but not always, the faculty advisor assigned to a student at the beginning of the graduate program becomes the thesis supervisor. In the majority of instances, Ph.D. and M.S. theses completed in the Department will be supervised and signed by current EAPS faculty and retired EAPS faculty who have remained active in the Department.

In some instances, the appropriate research advisor for a graduate student is a Principal or Senior Research Scientist in EAPS. When a Senior Research Scientist is the research advisor, a current member of the EAPS faculty will be assigned by the Specialty Committee [see below] as the student's academic advisor. The Senior Research Scientist, as research advisor, will be responsible for signing the completed thesis. When a Principal Research Scientist is the research advisor, a current member of the EAPS faculty will be assigned by the Specialty Committee as the student's academic advisor and co-Research advisor. The

Faculty co-research advisor will be responsible for signing the completed thesis.

Discipline Specialty Committees (SC)

In general, each of the four departmental disciplines has a "specialty committee" which oversees the general progress of each student in the specialty. Specialty committees work to maintain continuity in the student-advisor relationship and to establish overall standards of academic performance. These committees neither replace the faculty advisor nor assume any of the advisor's responsibilities. In meetings with the specialty committee, both the student and advisor may be involved.

EAPS Committee on the Education Program [CEP]

While each disciplinary group within EAPS has a Disciplinary Specialty Committee, the department has a Committee on the Education Program (CEP) that provides oversight for the entire program. The committee is composed of the Associate Department Head, Graduate Officer, Undergraduate Officer, and the Education Director. The CEP is responsible for the organization and enforcement of all aspects of the graduate curriculum and degree requirements, approval of general examination topics and committee membership, and monitoring of student progress as determined by grades and progress along the time line established for completion of the program. The committee:

- reviews student grades at the end of each term, and monitors student progress toward meeting program milestones such as timing of the general exam, submitting a thesis proposal, and finishing within five years
- mediates between students and advisors on an ad-hoc basis
- oversees the Student Research Fund (SRF)
- approves all new graduate subject offerings (including IAP) to ensure that they fit into departmental programs

The CEP meets at the end of each term to review the progress of graduate students and approve their continued registration, but additional meetings may be held at the request of any student or faculty member. Any action taken by this committee is done in consultation with a student's faculty advisor. Poor performance or tardiness in completing the General Exam, submitting a thesis proposal, or fulfilling any other criteria for graduation as

determined by the faculty advisor or CEP may result in denial of further registration. All students wishing to request an extension of an established deadline must petition the CEP. This committee, in conjunction with the Institute Committee on Graduate School Program, makes all final decisions with regard to continued enrollment.

MIT Committee on Graduate Programs (CGP)

This is an Institute committee that oversees graduate education at MIT. The committee shall consist of six elected faculty members, the Associate Chair of the Faculty, two graduate student members, and ex officiis , the Dean for Graduate Students and the Vice President for Research (or their designated representatives). The Committee shall exercise general overview of graduate programs and of students working for advanced degrees. Among its many other responsibilities, the Committee shall act with power on proposals for changes in graduate level subjects of instruction, upon requests from graduate students for approval of minor departures from general requirements, and in evaluating the academic performance of graduate students, including the issuance of formal warnings and denials of further registration in the graduate school.

http://odge.mit.edu/gpp/oversight/cgp/

MIT/WHOI Joint Program Committee

This committee acts with power in the areas of education policy, admissions, and allocation of resources within the MIT/WHOI Joint Program. Three education programs from the Joint Program are housed in EAPS; Physical Oceanography, Chemical Oceanography, and Marine Geology and Geophysics. The committee is co-chaired by the WHOI Dean and the MIT Director and includes the chairs of the three previously mentioned disciplinary committees. Each education program has an Education Coordinator who is available for advice and consultation in addition to his/her administrative duties.

The Academic Program Office at WHOI fulfills a role analogous to the EAPS Education Office. The MIT Joint Program Office, on the eighth floor of the Green Building (54-820), provides administrative support to joint program students on the MIT campus. Joint Program students also can consult with the EAPS Education Office.

EAPS EDUCATION OFFICE FUNCTIONS

The Education Office is located in 54-912. Education Office staff are:

Vicki McKenna
617-253-3380
vsm@mit.edu

Roberta Allard
617-253-3381
allard@mit.edu

The Education Office is involved with all academic functions within EAPS. This includes:

- Course Scheduling
- Assignment of Teaching Assistants
- Teaching Evaluations
- Submission of Grades
- Entering student funding awards
- Registration for Classes
- Accepting the Final Thesis
- Tracking student progress
- Reimbursement of education expenses

In addition to these functions, you might use the Education Office to schedule any of the classrooms in Building 54 for informal seminars, advising committee meetings, and practice talks.

A number of financial functions are also housed in the Education Office. The office collects and submits the information on graduate student support, processes reimbursements for expenses associated with entertaining a visiting student, and issues the request for proposals to the Student Research Fund and supervises the dispersal of funds awarded.

While you should not hesitate to ask anyone working in the Education Office about your questions on the above activities, you should recognize that the Education Office staff also act as a broader resource for you. The Education Office will listen to identified graduate student concerns and can act as an advocate or mediator so that faculty and students find a mutually acceptable solution. Most importantly, you should know that you may come to talk about problems that are troubling you. Any personal information you choose to discuss will be treated with strict confidentially.

REGISTRATION FOR CLASSES

Graduate students need to be registered for both the fall and the spring terms. Registration for IAP and Summer terms is optional and depends on each student's circumstances. Pre-registration takes place on-line and is required if a student will register for the coming term. Registration Day happens twice a year, at the beginning of the Fall & Spring semesters, although registration can take place during the proceeding and following weeks.

Registration is completed on-line, and it requires the advisor's approval. After the advisor approves the student's registration, the student must submit the list of classes to the Registrar. For the fall and spring terms, registering for 36 units is considered a full-time load. You should consider carefully before you register for more than 48 units.

Students who have not yet taken the General Exam usually register for specific courses that will provide the background and skills needed for their intended research field. Some of the EAPS education programs have a specific list of courses designed to outline the subject matter that the students in that specialty are expected to master. The lists are not strict requirements. In all cases, the advisor and the discipline specialty committee have the responsibility of determining the required courses for each student. If the number of units for these courses totals less than 36 units in any one term, a student should register for a pre-thesis research topics course (denoted by the phrase "Current Research" in the title). Adding Current Research to the registration provides credit for research activities and brings the total units to the recommended minimum of 36 units. Students may register for more than 36 units. Students who have passed the General Exam should register for 12.ThG. The number of units allocated to pre-thesis research topics or to 12.ThG should reflect the number of hours that the student is spending per week doing research work.

A student must be registered for a course in the summer term if he/she will be receiving a stipend. EAPS only offers pre-thesis research topics and thesis research courses in the summer. Tuition for these courses is 100% subsidized by the Provost if the registration is only for these courses. The student pre-registers on-line, and the registration form is sent to the Education Office where it is reviewed, signed, and submitted to the Registrar's Office.

GRADES

Description of Grading Criteria

Classes are approved by MIT's Committee on the Graduate Programs to receive either letter grades or Pass/D/Fail grades, and grades can only be assigned using the specified method. Check the bulletin or with the Education Office before the beginning of the term if you have any questions about a specific class.

The Institute Regulations of the Faculty (2.60) define the criteria for assigning all grades, regardless of whether they are letter grades, pass/fail grades, on one of the special grade

designations. Please consult the Regulations of the Faculty for a list of all grades used at the Institute. It is important to know that grades are not rigidly related to any numerical scores or distribution within the class. Criteria for letter grades are listed below.

A Exceptionally good performance demonstrating a superior understanding of the subject matter, a foundation of extensive knowledge, and a skillful use of concepts and/or materials.

B Good performance demonstrating capacity to use the appropriate concepts, a good understanding of the subject matter, and an ability to handle the problems and materials encountered in the subject.

C Minimally acceptable performance for graduate work, demonstrating partial familiarity with the subject matter and some capacity to deal with relatively simple problems, but also demonstrating deficiencies serious enough to make it inadvisable to proceed further in the field without additional work.

F Failed. This grade also signifies that the student must repeat the subject to receive credit.

"Note that the MIT internal grading system includes plus (+) and minus (-) modifiers for use with the letter grades A, B, and C for all academic subjects (except advanced standing exams). These modifiers are included on internal grade reports. However, they are not officially part of student's grades, they do not appear on MIT transcripts, and they do not affect internally or externally reported grade-point averages."

A student's grade point average "is computed by multiplying the grade points received in each subject by the total units assigned to that subject and dividing the sum by the total units. Grade points are as follows: A = 5; B = 4; C = 3; D = 2; F = 0; O = 0. Grades of I, S, SA, OX, T, and DR [dropped class] are used for incomplete or continuing work and are not used in computation of a graduate student's cumulative rating, and the grades of J and U not until final grades are received."

http://odge.mit.edu/gpp/registration/performance/

<u>Assessment of Graduate Student Grades</u>

Grades of "A" and "B" are both acceptable grades for a graduate student to receive. The Institute expects you to maintain a GPA of 3.5. When a graduate student receives a grade of "C" for a class, the student does receive academic credit but the student's performance is

considered more carefully by the disciplinary committee and the CEP. While the specific nature of this additional scrutiny varies by program, the following is generally applicable:

A grade of "C" in a class outside of the student's specialty is viewed more leniently than if the grade were received for a class central to the student's research area.

- Additional work might be required in some form. If course work in the specific area is not feasible, the student could demonstrate increased competency in the subject through additional reading and writing.
- Evaluation of a student's performance on the general exam could include consideration of the circumstances under which the "C" grade was received.
- The student's GPA must be high enough to indicate that his/her performance demonstrates an understanding of the complexities of the subject and the ability to apply this understanding productively.

Grade Reports

Classes are approved by the Committee on Graduate Programs to receive either letter grades or Pass/D/Fail grades. Grades can only be assigned using the specified method. Class instructors must assign each student an appropriate grade at the end of the class. The grade of Incomplete can be assigned if a minor part of the class work remains unfinished. Arrangements should be made with the instructor to complete the work as soon as possible.

DOCTORAL PROGRAM

The ultimate professional degrees conferred by the department are the Sc.D. (Doctor of Science) and Ph.D. (Doctor of Philosophy). In order to qualify for these degrees a student must demonstrate: 1) in-depth knowledge of the facts, concepts, and methodology of their chosen field of specialty and broader, comprehensive knowledge of discipline areas related to their specific field; and 2) demonstrate an ability to extend the state of knowledge in that field by independent research and the publication of original results. A student accomplishes these requirements through completing formal coursework, participating in graduate seminars, undertaking independent research projects, and completing original thesis research.

Entry into Graduate Study

Both research and formal coursework are important elements of the EAPS graduate program education. Formal coursework has the role of supporting a student's research interest and providing the necessary background and context. During each of the first four academic semesters, a student will normally enroll in regular academic subjects and/or Current Research subjects totaling at least 36 units. Current Research subjects are designed to permit students to participate in ongoing research under the supervision of a faculty member while also receiving academic credit and allowing for an assessment of progress at the end of the term. Evidence of a substantial contribution to the research effort is necessary to gain a satisfactory grade in a Current Research subject. Students working on a research project for the General Examination may sign up for as many as 24 units of Current Research subjects. Each research specialty has a pair of Current Research topics open for registration each term. One course of the pair is letter-graded, the other is graded on a Pass/Fail basis. Choose the appropriate member of the pair in consultation with your advisor.

A program of formal coursework is designed for each individual student with the intent of ensuring a strong background in mathematics and allied sciences in addition to the earth, atmospheric, and planetary sciences. This means that all students, prior to taking the General Examination, should have taken and received a satisfactory grade in mathematics courses through ordinary differential equations. If a student does not enter the doctoral program with this background, he or she must take appropriate classes at the start of the graduate program. In some instances, a student might enter the doctoral program with strong preparation in the supporting sciences such as mathematics, physics, or chemistry, but less preparation in the relevant disciplines in the earth, atmospheric, or planetary sciences. In this instance he or she might complete appropriate undergraduate courses at the beginning of his/her program.

Prior to registering for the first term at MIT, each entering graduate student should schedule a conference with the faculty advisor in order to establish a tentative sequence of formal subjects that will constitute adequate preparation for the doctoral degree.

Recognizing the breadth of our department, the faculty, as a whole, has not established a formal list of departmental subjects that all students must take for the doctoral degree.

Instead, each specialty group has designed a set of recommended and/or required courses

for their students. Your advisor will provide relevant advice on course selection.

Once a tentative class schedule is agreed upon by the student and advisor, the entering graduate student must meet with the appropriate specialty committee during registration week of their first term at MIT. The committee reviews the schedule and may suggest modifications. In PAOC, the student and the advisor determine the class schedule.

The student is expected to receive a grade of "B" or better in all subjects that are letter graded or a grade of "P" in pass-fail subjects, although the CEP is most concerned with the extent to which a student has mastered the material.

The General Examination

The General Examination is intended to establish a student's qualifications for entering the final phases of the doctoral program. This involves demonstration of the student's ability to identify significant research problems, to plan a program for contributing to their solution, and to make significant headway in carrying out such a program. The examination is designed to explore the student's depth of knowledge in a chosen specialty and breadth of knowledge in the earth, atmospheric, and planetary sciences that are closely allied with his or her specialty. The basic schedule for the General Exam is described below. Students in PAOC should consult Appendix B and then skip to "Entering Doctoral Candidacy", further down in this section. Students in the MIT-WHOI Joint Program should consult the manual for their sub-disciplines. All other students should see Appendix A at the end of this manual for a copy of the General Exam Checklist and Appendix E for an overall schedule for the General and Thesis Examinations.

Basic Format

All students are expected to take the General Examination before the start of the fifth academic semester of registration, or before the fourth academic semester if they already have an EAPS masters degree. (Summer is not, for these purposes, considered an academic semester.) If a student finds it impossible to complete the examination on schedule, he or she must petition the Committee on the Education Program (CEP) for an extension at least one month before the deadline. The petition must include a detailed statement of the reasons for failure to take the exam on time, a supporting letter from the faculty advisor, and a firm timetable for completing the exam. No extensions will be given unless there are compelling reasons (e.g., unplanned absence of the faculty advisor, personal tragedy), and

all extensions will include a time limit for taking a rescheduled exam. If a student does not take the examination on time and has not received an extension, the CEP may recommend to the Institute Committee on Graduate Programs that the student be denied further registration. If this occurs, the student must apply formally to the Admissions Committee for re-entry into the doctoral program.

The General Examination consists of a written part and an oral part. The written part requires a student to prepare two formal research reports. The written material should describe a significant new problem, outline the present state of knowledge in the appropriate field, propose an approach for attacking the problem, and discuss progress made towards reaching a solution. Commonly, one of these papers deals with the student's intended doctoral thesis topic. The two papers must deal with problems in significantly different specialties. It is not acceptable to submit two papers in the same specialty where one paper is a field study and the other paper is a laboratory or theoretical study. It is required that each project be supervised by a different faculty member. The total length of the two papers should not exceed 40 pages (typed, double-spaced), including figures and references.

The oral part of the exam will consist of a short (< 20 minute) presentation by the student on the research paper(s). Each presentation is followed by an oral questioning period where committee members will question the candidate in depth about the paper, about important aspects of the student's field of specialty, and about general topics in related fields. Three to four hours should be scheduled for the exam.

Committee Membership

The General Examination committee consists of at least four members from the faculty and senior research staff (Principal and Senior Research Scientists) so that the membership meets the following requirements:

- Student's research advisor
- Others chosen so that they represent a sufficiently broad spectrum of research specialties to ensure a "general" rather than a "topical" examination
- One member must be from a specialty different from that of the student
- A predominate number of faculty from EAPS

In all cases, the chairperson of the General Examination committee will be someone other than the research advisor.

Schedule

On or before the Add Date of the semester prior to the General examination, the student must submit a brief (250-word) abstract or prospectus for each of the two papers to the CEP. The student must also obtain the signatures of his/her advisor and the proposed General Examination Committee members on a Topics Proposal form, provided by the Education Office, indicating that they approve the two topics proposed and agree to be on the committee. The CEP meets the week following Add Date to review all proposals. In each case, the CEP reviews the student's proposal, judges the suitability of the research topics, particularly with regard to their being substantially different, and appoints members of the General Examination Committee, including the exam chair, taking into account the recommendations of the student and advisor. The CEP may choose to accept the proposed topics and exam committee or to require changes.

On or before the Add Date of the semester of the General Examination (or the Spring semester if the student is taking the examination during the Summer Term), the student must submit an Exam Schedule Form to the CEP, specifying the date and location of the General Examination. The form must be signed by the student's advisor and by each member of the appointed General Examination Committee.

The student is responsible for scheduling the actual examination by submitting the Schedule form to the Education Office, reserving a room, and submitting the final written papers to the General Examination committee at least two weeks prior to the exam. Any changes to the schedule should be reported to the Education Office.

Conduct of the Exam

The General Examination committee will meet in private session before the exam commences in order to establish guidelines for the conduct of the exam. It will meet again after the exam to determine the outcome. One of four outcomes is possible: Pass, Conditional Pass, Deferred Decision, or Fail.

A **Pass** allows the student to enter into the final phase of the doctoral program upon submittal of an approved thesis proposal.

A **Conditional Pass** imposes certain conditions that must be met before entering the final phase of the doctoral program. These conditions may include completions of incomplete classes, further coursework, or the writing of a more detailed research paper. The student must successfully complete any requirements regarding coursework at the first opportunity. For requirements other than coursework, the General Examination committee will meet without the student at an appropriate time, but no later than six months after the General Examination, and determine whether or not the student has met the required conditions. If the conditions were met, then the Conditional Pass will be changed officially to a Pass. Otherwise, the Conditional Pass will be changed to a Fail.

A **Deferred Decision** implies that the committee feels that special circumstances have affected the outcome of the exam and they recommend redoing part or all of the exam. The re-examination is scheduled with the approval of the CEP and should take place within three months of the original exam.

A **Fail** means that the committee is not satisfied with the student's progress toward the doctoral degree or their performance on the examination. Receiving this grade officially terminates the student's participation in the doctoral program. The committee has the option of recommending a student for a Master's degree. In this situation the student will still need to meet all requirements for the Master's degree, including a thesis, in order to receive the degree. Details regarding Master's degree requirements are given in a dedicated section of this document.

Entering Doctoral Candidacy

The final steps for obtaining a Ph.D. or Sc.D. degree are the completion of a written thesis and the successful defense of the thesis material in a public presentation followed by a private defense with the student's committee. The thesis must demonstrate a new and original contribution to the student's discipline area and show that the student can carry out independent research at the highest levels. The thesis must be judged to be satisfactory by the thesis advisor and the thesis committee.

The doctoral thesis for all EAPS students normally should be completed and defended within ten semesters after entrance into the program, and it is the role of the advisor to ensure that the student adheres to a research schedule that will lead to the fulfillment of this requirement. If a student is unable to finish within five years, both the student and

advisor must submit a written petition to the CEP requesting a time extension. Extensions will be granted only under special circumstances and will seldom be greater than one year. If a student does not receive an extension by the CEP or does not meet the extended deadline, then they are no longer eligible to receive financial support regardless of the source.

Establishing your Thesis Committee

Following successful completion of the General Exam, the student must notify the CEP of the members of their initial Thesis Examination Committee [TEC] within a month. The CEP has the final authority on the composition of the TEC. The Thesis Examination Committee (TEC) is comprised of four members, including:

- The student's thesis advisor
- One EAPS faculty member in the program area
- One EAPS faculty member outside of the program area. For PAOC students, this member may be in PAOC but they should be chosen to provide different expertise to the other members.
- One member, approved by the CEP, from outside the department (preferably from outside MIT). In PAOC, the external member is identified at the same time as the rest of the TEC but, in other areas, the external member might be chosen at a later date. The role of a committee member is to provide support and guidance to a student's research, and should be chosen with that in mind. The choice of the external member should include due consideration of the travel costs involved. In exceptional circumstances, the department may be able to cover some of these expenses if the student makes a formal request to the Department Head at least two months before the scheduled defense.

We note that Principal and Senior Research Scientists may serve as Committee members and that members may be added beyond the above minimum requirement. As with the General Examination, the majority number of Committee members must be EAPS faculty. Members of the TEC will provide important direction and oversight as you work on your thesis but, if you anticipate that it will be difficult for all members to attend the defense, you should add an additional member to the TEC. The members of the TEC at the actual meeting for the defense must meet the criteria specified above. A member has to be physically present at the defense or be connected by teleconference in order to vote on whether the thesis was successfully defended.

Submitting your thesis proposal

Before the start of her/his sixth term, the student should submit a thesis proposal ato the members of the TEC for their approval. The proposal should outline what will constitute the thesis; the key questions for each topic, the background of the problem, and goals for the research. The TEC will consider the worthiness and feasibility of the proposed research, whether the proposal has the potential to demonstrate the candidate's ability to make a creative contribution to the field, and whether there are the resources for appropriate supervision and execution. The thesis proposal must be filed in the Education Office after approval by the TEC. The appropriate form is on the Graduate Student Research page of the EAPS website.

Progress toward degree

Following the General Examination, the educational focus of the doctoral student shifts to research leading to the preparation of a doctoral thesis. A student should register for 12.ThG rather than a Current Research subject. The total number of units should still be 36 units. After the approval of the thesis proposal, the thesis advisor has the responsibility for monitoring the student's progress but the TEC has an important role providing advice and oversight. At least once a year, the student should arrange a meeting with all departmental members of the TEC. During this meeting, the student will describe the progress made on the thesis research and receive feedback from the committee. The date of the meeting and the attendance list should be reported to the Education Office. In some research areas the Specialty Committee will also meet with each student on Registration Day to review his/her progress.

DOCTORAL THESIS DEFENSE

Scheduling the Thesis Defense

Preparation for the thesis defense involves satisfying both departmental requirements and Institute requirements pertaining to the production, defense, and final submission of the thesis. Your defense must be scheduled no later than the date listed on MIT's Academic Calendar as the date that doctoral theses are due. Please consult with the Education Office about the last date to actually submit your completed thesis. PAOC students are expected to deliver a seminar on their theses during the semester prior to the defense.

MIT awards degrees in June, February, and September. No later than the first week of the semester during which you will defend your thesis, submit your degree application to MIT using the online Student Information System [WEBSIS]. Applications submitted after the deadline require the payment of a Late Fee. It is always easier for a student to be removed from the degree list at the last minute (no penalty involved), than to be added after the deadline. As soon as you have a firm date and time arranged with your committee members you should submit the schedule form (found on the Graduate Student Resources page of the EAPS website) to the Education Office. You should start the scheduling process no later than two months before the anticipated defense. It is often difficult to find a time everyone can meet. In exceptional circumstances, the department may be able to cover some of the travel expenses incurred by the external member. However, this requires a formal request to the Department Head at least two months before the scheduled defense. It is the student's responsibility to arrange the availability of a room for the defense and to coordinate the travel plans of the extra- departmental examiner if necessary.

Roughly one month before the defense, the student should schedule informal meetings to discuss an early draft of their thesis with each MIT member of the TEC. At least two full weeks before the defense, the student must deliver copies of the thesis to the members of the TEC and to the Education Office in room 54-912. At this time the student must also deliver to the Education Office a signed copy of their defense notice (available the Graduate Resources page of the EAPS website). The Education Office will publicize the defense on the department calendars and in the building. See Appendix C at the end of this manual for a copy of the Thesis Defense Checklist.

The Thesis Defense

Prior to the Defense, the student and advisor will select a Chair who may not be the advisor or the external member of the TEC. This selection and the composition of the TEC will be reviewed by the Education Office and Graduate Officer. The CEP has the final authority on the composition of the TEC. Contact the Education Office or download from the EAPS website a copy of the appropriate form.

All members of the TEC must be present at the defense, either in person or via teleconferencing (in person is encouraged). The defense consists of a public oral presentation of results followed by one or two rounds of questioning, as determined by the Chair of the TEC. After the thesis defense, the advisor will submit the signed sheet stating

the TEC's acceptance or rejection of the thesis to the Education Office. A checklist for final thesis preparation is given as Appendix D of this document.

The doctoral thesis is presented to and defended before the TEC and the greater academic community. The defense is intended to demonstrate that the student has carried out a program of independent research of a creditable standard and that they can present the results coherently.

All defenses must be conducted on the MIT campus during normal working hours. The student makes a 45 to 60 minute presentation of the chief results and conclusions of the research. This presentation is open and may be attended by other students and staff members. General discussion and questions from the audience may follow this presentation. Examination by the TEC is done in private, although the chair may invite interested staff or visiting faculty to remain as observers. All members of the TEC shall vote on the acceptability of the thesis and its presentation.

Opinions and impressions of faculty and staff observers also present at the defense are welcome and encouraged. However, only members of the TEC may vote and a majority vote is necessary to pass. A quorum for the meeting requires that the minimum membership of the TEC, as defined earlier in this document, must be present. A member of the TEC must be present at the defense (either in person or via teleconferencing) to register a vote. Any comments or opinions offered by a member of the TEC prior to or immediately following the Defense are not equivalent to a vote on the acceptability of the thesis. Dissatisfaction with the written thesis may result in required rewriting. In this case, a new defense may or may not be required but the TEC must certify that the work has been done before the thesis is accepted and the degree awarded. Failure could result in termination from the program or a requirement that additional work be carried out by the student on the thesis project, in which case a new defense must be scheduled but with as many of the original TEC members as is possible.

THESIS SUBMISSION

A checklist of all requirements relating to submission of the official dissertation is given as Appendix D to this document.

After successfully defending a thesis and making required changes, degree candidates must submit two copies of the final draft of their thesis to the Education Office. Please see Appendix D for a checklist of requirements. The MIT Specifications for Thesis Preparation are available at the MIT Libraries web site:
http://libraries.mit.edu/archives/thesis-specs/.

The only departmental exception to these specifications is that the custom in EAPS has been for the title page to have the signature of the Department Head rather than that of the Graduate Officer. Each copy of the thesis must be unbound with cardboard front and back covers. The front cover must include the thesis title and author. Suitable cardboard covers can be picked up in the Education Office.

The department will reimburse the student for the thesis submission fee upon receiving documentation of the cost. A delay in delivering the thesis to the Education Office will result in removal from the degree list. No exceptions are made. It is the student's responsibility to verify all deadlines with the Education Office prior to the end of the semester one plans to graduate.

Students in the Joint Program are required to submit an additional two copies to the Academic Program Office at WHOI. The student's thesis research advisor will submit a grade for the thesis to the Education Office. The dates for submission of grades are specified in the Academic Calendar.

MASTER'S PROGRAM

The Master's program in EAPS at MIT has three main objectives: (1) to equip the student with a solid earth sciences background (2) to train the student to have strong quantitative problem solving abilities, and (3) to allow the student to pursue deeper study of a specialized area of earth, atmospheric, and planetary sciences by completion of an acceptable piece of original scientific research. The amount of time required to complete the Master's program will depend, in part, on the student's undergraduate background. In most cases, four terms of academic study plus one or two summers are necessary.

Undergraduates in closely allied disciplines of study at MIT are eligible to apply to the EAPS 5th Year Master's Program. These students are expected to finish all degree

requirements within two academic semesters but continuation into a final summer term is acceptable. Any further extension requires the permission of the CEP. The student should prepare a petition, secure his/her advisor's signature, and submit the petition as soon as the need for an extension is realized.

Objectives (1) and (2) above require satisfactory completion of formal required subjects. Master's candidates are required to complete at least 66 units worth of formal subjects (i.e., exclusive of thesis units), 42 units of which must be "H" level. Students arrange individual programs of study with the advice and consent of the faculty advisor and Specialty Committee. During the first two semesters, most, if not all, of these units will consist of registration in regular lecture or seminar-style subjects. Once the Master's candidate starts work on the thesis, registration for thesis units may make up part or all of the total number of 36 units per term. Students are permitted to take subjects offered in other departments to supplement the offerings in EAPS. Satisfactory performance is defined as a grade point average of 3.5 or higher, and a grade of "B" or "A" in subjects related to the student's program of study.

The third objective requires completion of an acceptable Master's thesis, based on the student's original research. The Master's thesis must make a contribution to the knowledge in the particular field of study, the acceptability of which is determined by a private thesis defense. There is no requirement to post a notice two weeks prior to the defense. The TEC for a Master's thesis consists of three members, including the student's advisor. There is no requirement for an outside member. Your defense must be scheduled no later than the date listed on MIT's Academic Calendar as the date that doctoral theses are due. Please consult with the Education Office about the last date to actually submit your completed thesis.

Before Add Date in the first academic term, the student should form a Thesis Examination Committee (TEC) that is composed of the student's Advisor and at least two other members of the EAPS faculty. Senior and Principal Research Scientists in EAPS are also eligible to serve on the Committee. The composition of the TEC is reviewed by the Education Office and the CEP. Contact the Education Office for or download from the EAPS website a copy of the appropriate form. A checklist for preparation for the thesis defense is given as Appendix C. Two weeks prior to the defense, the student must deliver final copies of the thesis to the members of the TEC. All members of the TEC must be present at the defense, which will consist of, at least, a 30-minute oral presentation of

results followed by one or two rounds of questioning, as determined by the Chair of the TEC. After the thesis defense, the advisor will submit both the signed sheet stating the TEC's acceptance or rejection of the thesis and a grade to the Education Office. A checklist for final thesis preparation is given as Appendix D of this document.

TRANSITION TO PH.D. PROGRAM

After a student has started a Masters program in EAPS, the student and advisor might decide that a move into the Ph.D. program would be appropriate or desirable. This change in status requires the completion of all the requirements for the Masters program. The student should consult with the Education Office on how to submit an application for review by the CEP no earlier than one month prior to the student's defense of the master's thesis. In all cases the application must be submitted before the finished master's thesis is given to the Education Office. New GRE scores are not required and scores from the previous application should be included on the application for reference. A total of two letters of support are required; one from the masters research advisor and one from the proposed advisor for the doctoral research. If the same person will be the advisor for both projects, a faculty member familiar with the student's work should write the second letter. The Masters thesis can be used as one research project for the General Exam, but this option should be discussed among the student, advisor, and the members of the general exam committee.

BUILDING A GOOD RELATIONSHIP with your ADVISOR

The content of this section relies heavily on the handbook produced by the University of Michigan for its graduate students. Copies are available on the web at the URL below.

Graduate Students: How to Get the Mentoring You Want: A Guide for Graduate Students at a Diverse University
<http://www.rackham.umich.edu/downloads/publications/mentoring.pdf>

WHAT SHOULD YOU EXPECT FROM YOUR ADVISOR?

EAPS has a distinctive culture that values excellence in research. While the nature of science is collaborative, no researcher can stand alone; it also, at its heart, is built on contention. The validity of ideas must be able to withstand examination and questioning. Because people here care fiercely about their work, discussions among our scientists can be quite passionate. Successful researchers learn to support their ideas through the vigorous give-and-take of talks with colleagues. Remember, it's professional, not personal. During your graduate career you should retain your perspective and place your experience in this context.

The relationship between you and your advisor will develop and change over your career in the department. Initially, both of you will learn to work with each other as you do research toward your general exam. After the approval of your thesis proposal, the relationship will mature into a collaboration between equal partners. The essential ingredient for a good relationship that will be present throughout is the need for good communication between you and your advisor. You should feel free to express your ideas and concerns both about the progress of your research and program matters. You should also listen to advice and suggestions from your advisor. When an advisor expresses concern about your research or progress, it is important not to interpret this as personal criticism.

With that general background, what can you expect from your advisor?

- Most importantly, you should expect guidance on your research and dissertation. This should include:
    1. Help identifying tractable and significant research problems, particularly as you start your graduate career. This aspect of the

advisor/student relationship should naturally evolve as you gain more experience.

2. Clear guidelines on the standards that your research should meet
3. Encouragement to pursue your own ideas
4. Editing of your written work and comments on your oral presentations so you can improve your communication skills
5. Advice on your strengths and weaknesses as a researcher

- In the doctoral program, your advisor will provide your financial support while you are making "satisfactory progress" toward your degree. For this reason, it is important to meet all the milestones in the timeline for completing your program and to keep your advisor informed of your research progress.
- Your advisor should be a source of encouragement and support. Communication between the two of you should reflect mutual respect.
- Your advisor is committed to help you manage the transition between undergraduate and graduate work. There is no recipe for this, and the approach must necessarily be tailored to the special relationship between you and your advisor.
- At or after your general exam, a Ph. D. Thesis Committee will be formed. You should regard the Committee itself and its individual members as resources to help you with your thesis work. EAPS requires that you meet with your committee at least once per year.
- As your graduate career advances, your advisor is a resource for helping you build a network of colleagues and being willing to provide letters of reference when needed.

BUILD A MENTOR NETWORK

While your advisor is an important person in your academic life, you need to regard him/her as a foundation. Your advisor is only one person with a specific set of strengths and weaknesses that make him/her a unique person. An advisor cannot be all things to every student, or even to any one student. As an example, a junior faculty member might be a good source of enthusiasm and receptive to novel approaches. A more senior faculty member often has more extensive knowledge of the working of the Department and the

Institute, and may have more influence within your program or the Department. For this reason, you should build a network of mentors. This should be a continuing process as you advance in your graduate career.

Mentors often are members of the faculty and your committee members might be excellent mentors, but don't limit your horizons to faculty. Your fellow graduate students have found valuable support from:

- Senior graduate students
- Post docs
- Researchers at other schools
- Visiting Scientists / Professors

As you build your network, consider your needs and how each person's role within your network contributes toward meeting these needs. Also recognize that your needs will change over time.

Your peers also have valuable roles within your mentor network. You are all resources for each other in one capacity or another. A professional discussion on discipline-related issues can be carried on in an atmosphere of personal support. Remember that your support network will be strongest when you form multiple and diverse connections among your peers.

WHAT ARE YOUR RESPONSIBILITIES?

Your first responsibility is to take yourself seriously as a researcher and a scholar. If you do this, it will positively affect all aspects of your professional life. Your second responsibility is to know the structure and rules of your program. This is general advice that is important to remember, but you need to implement it through concrete actions. Let your advisor and advisory committees know what you are thinking and doing. In general, make certain your conversations and actions communicate your motivation and direction and highlight your skills and strengths.

It is your responsibility to be aware of and meet deadlines and requirements.

Addressing relevant issues in meetings demonstrates your initiative and is a practical necessity. Be flexible about scheduling. It is commonly hard to find a mutually agreeable

time for meeting because of everyone's crowded schedules. Don't use this as an excuse to procrastinate. Arrive at meetings with an agenda you are prepared to follow. Your goal is to remain focused on your agenda while being responsive to issues that arise during the meeting. Discuss not only your current research plans and any approaching program deadlines, but also your plans for meeting attendance and publications.

During the meeting and when mentally reviewing it afterwards, receive criticism the right way. It is offered to help you develop your skills and is not meant as a personal critique. After a meeting, provide participants with a summary of agreements and plans. The exercise of putting your thoughts on paper will help ensure that you are thinking clearly about the results of the meeting. Finally, follow the advice of your committee and advisor.

DEALING WITH PROBLEMS

To keep problems from occurring, talk with your advisor to clarify the roles and responsibilities you each have in regards to meetings, feedback, and reminders. Each faculty member has a preferred method of working with their graduate students. If your advisor doesn't discuss this early in your relationship, you should ask about his/her approach to communication. While there are shared common features, each graduate program in EAPS has its own procedures for tracking the progress of their students. Be aware of how your program operates. Periodically review the Graduate Studies Manual since it is your responsibility to be informed about deadlines and to ensure that they are met.

Establishing and maintaining a supportive culture for all department members is a priority of the Department Head. With the Department Head's encouragement, the female students and other women in EAPS have self-organized and created the group "Women in Course 12" or "WiXII". The group is semi-autonomous and has an endowed operational budget. This group holds regular events and meetings that are open to all members of the EAPS community.

If problems do arise within your program or with your advisor, have realistic expectations and be willing to look at the situation from the points of view of all involved. Do not hesitate to consult your peers. When dealing with the situation, concentrate on the problem and your actions and responses, not personalities. Remember that your thesis committee is

an important source of support. You should feel free to consult them as a group or individually. Students in the Joint Program can find an additional avenue of support by consulting the Education Coordinator for their program.

Remember that you are part of a larger organization and you have resources available to you. You can meet with a someone at the Institute Ombuds Office or someone at Mediation@MIT with the assurance of complete confidentiality. The staff in Student Support Services are experts at dealing with many problems from time management issues to mental health issues of serious concern. You will always be able to get an appointment speedily. You can find their contact information on the Institute web site.

Should you wish to enlist help in a more formal manner, you have options both within and outside EAPS. You can choose to bring the situation to the attention of the specialty committee associated with your research program, the Education Office, or the Department Head. Within the Institute structure, you can meet with the Dean of the Graduate School.

MIT and EAPS are committed to providing a learning, living and working environment free from gender-based discrimination. Gender-based discrimination is not tolerated. You will find relevant policies, procedures, reporting options, and resources on MIT's Title IX web pages:
http://titleix.mit.edu

Occasionally a graduate student feels it is necessary to change advisors. If you determine that you are in this situation, make discrete arrangements to identify a new advisor before taking other actions. Be certain that you are keeping the focus on actions and not on personalities. Maintain a professional demeanor and complete your obligations to your old advisor.

APPENDICIES

APPENDIX A - General Exam Checklist (PAOC students should refer to APPENDIX B)

_____On or before Add Date of the semester prior to examination: Student submits to Committee on the Education Program (CEP) abstracts of two research papers and a recommended committee (including outside member).

_____Within two weeks of Add Date: the CEP judges suitability of research topics and will appoint general examination committee.

_____On or before Add Date of the semester of the General Exam: Student submits to CEP the Exam Schedule form with the date and location of the exam. The Education Office must be kept informed of any subsequent changes to the schedule.

_____At least two weeks prior to the examination: Student submits final research papers to members of the examination committee.

_____Within one month following successful completion of the General Exam: the student must notify the CEP of the members of his/her initial Thesis Examination Committee [TEC].

_____Before the start of her/his sixth term: the student should submit a thesis proposal to the members of the TEC for their approval. Once the proposal is approved by the TEC, the student should submit the proposal to the Education Office.

APPENDIX B - Alternative Structure for the General Exam

Description

The general examination in PAOC is offered once each year, in the last half of May. Candidates are expected to take the examination no later than the end of their fourth regular semester of graduate study. In extenuating circumstances, a student may request to take the examination in January instead of May and/or to delay the examination until the end of the fifth semester. An application to take the examination in May should be turned in to the PAOC Administrator by the end of January. The PAOC Exam Committee will establish an ad hoc committee composed of a member of the Exam Committee, the advisor, and two other members of the faculty and/or senior research staff, one of whom may be nominated by the candidate.

Format and Conduct of the Exam

PAOC students select one of two optional formats of the general exam:

Option I: This option consists of two parts:

1. Two research papers on subjects that the candidate chooses in consultation with his/her advisor. The two papers must be supervised by different faculty members and be on appreciably different topics. For example, observational and theoretical papers addressing the same issue will not be considered "appreciably different". These topics must be approved by the PAOC Exam Committee as part of the application. The papers will usually be due in early May.

2. An oral examination by the ad hoc committee, usually during the last week of May. The committee will usually focus on the research papers and will ask questions designed to ascertain the candidate's command of knowledge deemed essential to his or her endeavors.

Option II: This option consists of three parts:

1. A research paper on a subject that the candidate chooses in consultation with his/her advisor. This will usually be due in early May.

2. A four-day, take-home examination, usually administered in mid-May. The exam will usually consist of a choice of several out of a larger set of questions. These questions should

not be of a character ordinarily found in course exams but to test breadth of knowledge and ability to synthesize knowledge from different areas of Atmospheric Science, Oceanography, and Climate. The answers are due 96 hours after distribution of the examination, should not total more than 20 pages in length and should be typed or clearly hand-written in ink. The candidate may use the library and other facilities but must not consult with others.

3. An oral examination by the ad hoc committee, usually during the last week of May. The committee will usually focus on the research paper and written exam and will ask questions designed to ascertain the candidate's command of knowledge deemed essential to his or her endeavors.

The outcome of the General Examination will be determined by the ad hoc committee in consultation with the PAOC faculty, during a faculty meeting usually held during the Friday of the week that the oral exams are conducted. The committee's decision is based on all aspects of the candidate's academic preparation, including performance in related course work, and not solely on the written and oral material derived directly from the General Examination.

If the candidate is found to have failed the General Examination or a part of it, they may repeat the exam or a portion of it the next time it is offered. The committee may or may not recommend that the candidate repeat the examination. A student who continues despite an adverse recommendation may be denied financial support. Any candidate who repeats the examination must present a complete thesis proposal as the research paper. Continued registration as a doctoral candidate will be refused for those who fail to pass the General Examination on the second attempt.

Schedule

January: Student submits application to take the general examination to the PAOC Administrator.

Sometime in February, each candidate will be informed of the composition of his or her ad hoc exam committee and the dates on which the papers are due as well as the date and time of the oral examination. If Option II is selected, the candidate will be informed of the dates and times on which the written exams are distributed and on which they are due.

Generally, research papers will be due during the first week of May, the written exam will be administered in mid-May, and the oral exams will be scheduled during the last week of May.

APPENDIX C - Thesis Defense Checklist

_____In the semester prior to the thesis defense: PAOC students should give a pre-defense seminar.

_____At least two months prior to thesis defense: Student submits the scheduling form for the thesis defense. The form is available on the EAPS Graduate Student Resources page of the EAPS website. The information requested includes an update on the membership of the thesis examination committee (TEC), chairman of the committee, title of the thesis, and proposed date, time, and location of the examination.

_____One month prior to the thesis defense: Student schedules informal meeting or meetings with members of the TEC to discuss the thesis.

_____At least two weeks prior to thesis defense: Student submits final defense copies of the thesis to each member of the TEC.

_____At least two weeks before the defense: Student submits defense copy of the thesis to the Education Office along with the signed notice of the thesis defense. The Education Office is responsible for notifying the department and MIT of the scheduled defense.

APPENDIX D - Final Thesis Checklist

_____Application for advanced degree submitted online to the Registrar's Office. Consult Institute academic calendar for deadline.

_____Submit to the Education Office two copies of the thesis, *including the title pages,* are printed on archival bond paper. Paper for printing is available in the Education Office

_____Both copies of the thesis have original signatures.

_____The thesis title and author's name on the title and abstract pages match the information on the application for advanced degree.

_____All pages are collated correctly in one continuous sequence with the title page as page one, and there are no missing or incorrectly numbered pages.

_____The thesis is free from adhesives such as glue, tape, spray mount, sticky labels, and photographs are either dry mounted or submitted on 8-1/2" x 11" photographic paper.

_____For doctoral degree candidates: A copy of the completed UMI form, with copies of the title page and abstract attached are included with the submitted thesis.

_____The receipt for payment of thesis processing is included.

APPENDIX E - Schedule of General and Thesis Examinations

	First Semester	**Second Semester**
Year 1	Before or on Registration Day: Meet with advisor and/or specialty committee to draft tentative course schedule.	Late in semester: Meet with advisor to discuss and agree on General Examination paper topics.
Year 2	Early in semester: Meet with advisor and/or specialty committee to review progress on papers and establish a proposed General Exam Committee [GEC]. Before Add Date: Formally submit abstracts of general exam papers and names of proposed GEC members to Committee on the Education Program [CEP]. PAOC students complete exam application by end of January and turn in to PAOC Administrator. Within two weeks of Add Date (February, for PAOC), the CEP will meet to consider the paper topics and appoint the members of the GEC.	Before Add Date: Set date for General Examination, after consultation with GEC and schedule room. Meet with advisor to review progress prior to General Examination Two weeks before exam: Submit papers to GEC. COMPLETE GENERAL EXAM Students not completing GENERAL EXAM may be placed on Dean's warning list.
Year 3	Meet with advisor to establish a tentative TEC. Submit a thesis proposal to the TEC committee members for review and approval at a committee meeting. Submit approved proposal and committee membership to the Education Office. Registration denied for students not completing their General Exam by the	Meet with advisor and TEC to review progress on thesis research In not completed in the previous term: Submit a thesis proposal to the TEC committee members for review and approval at a committee meeting. Submit approved proposal and committee membership to the Education Office.

	end of this term unless other arrangements have been made at the time of the original GE.	
Year 4	Meet with advisor and TEC to review progress on thesis research	Meet with TEC members to discuss thesis progress. This is required if not done in the previous tem. It is recommended that you meet with your TEC frequently.
Year 5	Meet with TEC members to discuss thesis progress. Choose outside member of TEC if this has not been done earlier. PAOC students: deliver a seminar on their theses prior to the defense.	Your defense must be scheduled no later than the date listed on MIT's Academic Calendar as the date that doctoral theses are due Two months before defense: • Schedule defense and arrange for room. • Submit to the CEP the final names of TEC members, name of chairperson, title of thesis, and schedule. One month before defense: Informal meetings with TEC members to discuss thesis. Two weeks before defense: Submit defense copies of thesis to TEC members and the Education Office. Also provide the Education Office

GEC = General Examination Committee TEC = Thesis Examination Committee

CEP = Committee on the Education Programs

APPENDIX F. - Maternity Leave Policy for Graduate Students

MIT fully supports paid leave for female graduate students before and soon after childbirth. This policy applies to any full-time, registered MIT graduate student woman. It is limited to women who anticipate giving birth, and does not apply to adoption or to men supporting their wives or partners during or after childbirth.

1. Eligibility: A student anticipating childbirth is eligible for paid leave, hereafter called "Childbirth Accommodation". The accommodation period normally begins on the date specified in a petition filed with and approved by the Office of the Dean for Graduate Education (see below); or in cases wherein childbirth occurs prior to filing the petition, on the actual date of childbirth. A form for filing the petition is online at
   <http://web.mit.edu/odge/gpp/registration/ChildbirthForm.pdf>
2. Benefits: A student may choose a leave period of one month, one and a half months, or two months. The length of the accommodation period will normally be decided in consultation with the Dean for Graduate Education. During this period, the student will continue to receive her stipend at the full, pre-leave rate. Childbirth Accommodation will stop the academic and research clocks with regard to assignments due, reports anticipated, or other class and research related requirements, including TA duties. A student's access to on-campus medical facilities will continue, and does not affect eligibility for outside hospitalization benefits, provided that appropriate tuition and health insurance fees have been paid for the term in which delivery is anticipated. Students residing on campus and approved for Childbirth Accommodation can remain in the residence hall, as appropriate.
3. Planning for Childbirth Accommodation: To begin planning for the accommodation period, the student is strongly encouraged to initiate conversations with advisors and departmental administrators approximately five months prior to the anticipated childbirth. This planning period will permit the department and the student to consider together:
   a. The advisability of and alternatives for a TA assignment in the term anticipated for delivery
   b. Plans for time-sensitive research presentations or reports
   c. Other issues of importance (e.g., field work, doctoral general examinations, publication deadlines, or other milestones in the student's program)

   The Office of the Dean for Graduate Education administers the policy through a petition process. (see below). This petition does not require departmental approval but is reviewed and approved by the Dean for Graduate Education. Departments should take

appropriate steps to support students with regard to assignments and program milestones. Faculty are expected and encouraged to make arrangements with the student to submit work for completion of requirements when the student returns. Where appropriate, "O" and "OX" grades can be assigned. In most cases, grades of "Incomplete" would not be appropriate.

Departments should be sensitive to the potential impact of the period on the visa status of international students, and should consult with the International Students Office when working with an international student who is planning an accommodation period due to childbirth.

4. Approval: *Every School of Science doctoral student who is eligible for leave associated with childbirth accommodation will be approved for paid leave and other benefits.* To receive this support, eligible female graduate students should submit a petition to the Dean for Graduate Education including a statement by the student's medical service provider, with a best estimate of the delivery date. A petition may also be submitted after delivery. Formal approval of Childbirth Accommodation is granted by the Dean for Graduate Education, after appropriate consultation with the student's department, who will notify relevant department and central administrative offices that Childbirth Accommodation has been approved, and the dates for which the period has been granted.
5. Sources of funding: Students supported by an RA or TA appointment will receive a stipend that is paid from the MIT Childbirth Accommodation Fund. Students who are not supported by RA or TA assignments, for example students on a fellowship, may petition to take advantage of a Childbirth Accommodation period, but are not entitled to tuition or stipend funding from the Childbirth Accommodation Fund. Funding to support these leaves will be funded through a combination of funding from the Department and Dean for the School of Science.

For full policy details and provisions, please visit:
http://web.mit.edu/odge/gpp/registration/changes/childbirth-accomodation-maternity-leave/