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The Student Handbook is meant to inform graduate students of the basic rules (shown in bold), along with additional comments for clarification, suggestions, and common practices that arise in connection with the graduate programs of the Department of the Geophysical Sciences. A number of the key terms are indicated by italics.

The Ph.D. Degree

The Ph.D. program has two phases: *Precandidacy* and *Candidacy*. The emphasis during *Precandidacy* is on course work and independent study designed to strengthen and enlarge the student's grasp of fundamental knowledge, particularly in the areas of potential dissertation research. During this phase, the student should also begin defining a dissertation topic including, as necessary, preliminary work to determine feasibility. The *Candidacy* phase consists mainly of research and writing a *Dissertation*. At the conclusion of each phase of the program there is an examination. The *Candidacy Examination* consists of a written part designed to test comprehension of basic principles, followed by an oral part aimed at assessing the student's preparation for dissertation research. In most cases, but ultimately at the discretion of the *Advisory Committee*, a *Prospectus* in the form of a research proposal is presented to the *Advisory Committee* several weeks before the written exam. Successful completion of the *Candidacy Examination*, and acceptance of the *Prospectus* as a realistic proposal for dissertation research, advances the student to *Candidacy*. From this point on advising will be done by a *Dissertation Committee*. The *Final Examination* occurs at least two weeks after the dissertation is submitted to the student's *Dissertation Committee*. The *Final Examination* is of two parts: (1) A meeting with the *Dissertation Committee* to determine whether the dissertation is ready to be submitted to fulfill the requirement of the Ph.D.; and (2) An oral presentation and defense of the dissertation that is open to all interested persons. Successful completion of the two parts of the *Final Examination* process results in formal approval of the dissertation, its submission to the *University Dissertation Office*, and the recommendation that the candidate be awarded the PhD degree.

All students in the Ph.D. program are given tuition and a monthly stipend from a combination of *Research Assistantships*, *Teaching Assistantships*, and *Fellowships*. Once in residence, students are encouraged to apply for *Research Fellowships* from granting agencies such as the National Science Foundation and the National Aeronautics and Space Administration.

The Precandidacy Phase

The Initial Year

On arrival, each student is assigned an *Interim Advisor* who provides academic guidance and is available for discussions of issues that may arise during the student's first year of residency. **The student should meet with the *Interim Advisor* at least once a quarter during their first**

year of residency to discuss course registration, research interests, and general progress. Students are encouraged to meet with other faculty members for additional advice or guidance, and can also always contact the *Graduate Counselor* if difficulties arise. Students are also encouraged to take a wide array of classes, attend all departmental seminars, and participate in reading groups and/or lab meetings as an excellent way to get to know the faculty and identify faculty members that might be most suitable to serve as their *Permanent Advisor* and as members of their *Advisory Committee*.

Advisory Committee

At any time during the first year of *Precandidacy*, but no later than the end of the third quarter, the student should obtain the consent of a member of the Department faculty to serve as a *Permanent Advisor*. Together, they will enlist a permanent *Advisory Committee* consisting of the *Permanent Advisor* as Chair and at least two other faculty members whose areas of expertise are relevant to the topics the student is considering for dissertation research. Additional faculty members including persons from other departments and other institutions may be invited to join the *Advisory Committee*, but at least three members of the *Advisory Committee* must be University of Chicago faculty members, and a majority of the committee must be faculty of Department of the Geophysical Sciences. The function of the *Advisory Committee* is to determine the make-up of the remainder of the *Precandidacy* program, to provide advice on developing a program of research, and to serve as the examining board for the *Candidacy Examination*. Students are expected to take the initiative to secure a *Permanent Advisor*. If a *Permanent Advisor* has not been identified by the end of the third quarter of residency, the student should communicate this to his/her *Interim Advisor* and to the department's *Graduate Counselor*. The *Interim Advisor* along with the *Graduate Counselor* will meet with the student to consider the case and resolve any problems identifying a suitable *Permanent Advisor*.

Annual Progress Reports

Every student is required to meet with his/her *Interim Advisor* quarterly until a full *Advisory Committee* has been constituted, and then at least once every academic year with the *Advisory Committee*. These meetings serve to review progress. **Every student, regardless of year in the program, must submit each year a *Department Annual Progress Report*, which is filled out by the student and signed by his/her *Interim Advisor*, or once constituted, by the *Advisory Committee* or *Dissertation Committee*.** The *Progress Report* should include a brief synopsis of academic work undertaken during the previous year, other notable achievements such as papers and talks, and a statement by the student's *Interim Advisor* or *Advisory Committee* regarding whether this work constitutes reasonable progress in the program. **The *Progress Report* must be submitted to the *Graduate Student Services Office* of the Department at the end of each academic year for the student to remain in good standing and thus be able to register for subsequent quarters.**

Residency Requirements

A student must be in residence at the University during the *Precandidacy Phase*, except for interruptions (such as the Summer Quarter) that have been approved by the *Advisory Committee*. A minimum of nine quarters in residence is required for a PhD and in each quarter of residence the student must register for a full program of three courses per quarter. As the student progresses through the program, some or all the course requirements can

be satisfied by registering for independent reading and research. Part-time registration requires special approval by the student's *Advisory Committee*. Registration dates are noted on the inside cover of the University Directory and timely notices are posted in the Department. Registration materials are available from the *Graduate Student Services Coordinator* on the days of registration.

Candidacy Examination

The *Candidacy Examination* consists of two parts: a written part and an oral part. The *Advisory Committee* with the *Permanent Advisor* serving as Chair administers both parts. The *Advisory Committee* will provide written exam questions and, in consultation with the student, may solicit additional exam questions from other members of the University faculty or research staff, or from persons at other institution. The usual practice has been for the exam to include questions from five or six persons, thus *Advisory Committees* with less than five persons will likely solicit additional questions from persons not on the committee. **The exam should be taken during the spring quarter of the second year of residency, by which time the student should have identified a topic for the dissertation research and prepared a written research prospectus (see description of the prospectus below).** Once the *Permanent Advisor* has approved the prospectus in general terms, it is distributed to the entire *Advisory Committee*. The most common practice is for the written exam to be scheduled no sooner than two weeks following delivery of the prospectus to the *Advisory Committee*. However, at the discretion of the *Advisory Committee*, the written exam may be given before a formal prospectus is submitted. **In all cases, the topic of the *Research Prospectus* must be approved by the *Advisory Committee* and the final written version of the *Prospectus* must be delivered to them at least two weeks prior to the oral exam.**

The Written Examination:

Purpose: to evaluate general intellectual ability and background in broad areas of science relevant to the student's research interests.

Preparation: The subject matter of the written examination corresponds in level with that of a 300-series (graduate) course. The *Advisory Committee* will give the student a general idea of the areas to be covered in the written exam.

Procedure: The examination may be open or closed book, in whole or in part, as determined by the *Advisory Committee*. Depending on the student's area of specialization, the entire exam may be confined to 5–6 hours on one day or spread over five days, with one question each day.

The Oral Examination:

Purpose: To evaluate the student's promise as a creative research scientist, and to follow up on issues of preparation raised by the written exam.

The Research Prospectus:

The prospectus is a carefully argued research proposal of 10 or 15 pages with a comprehensive bibliography. Students are encouraged to write their prospectus as if it were a proposal for a research grant, itemizing the goals and intellectual merit of the research, the key methods and materials to be used, critical background information that demonstrates the writer's scholarly command of the topic, expected outcomes, and a timetable for completion. It will

generally include some preliminary results of original work but this may take many forms, such as a demonstration of proficiency at a key method, evidence that samples or other materials critical to the project are available or readily acquired, or preliminary experimental results or field observations showing that a proposed approach is viable. The research proposed in the prospectus need not be the eventual subject of the dissertation research, but in most cases it does outline a program of research to be carried out during the summer following the second year that later expands to become the dissertation.

Schedule:

The written part of the *Candidacy Examination* should taken in the Spring Quarter of the second year in residence. Under special circumstances and with permission of the *Advisory Committee*, the deadline may be extended to the seventh quarter of residence, excluding summers (usually the Autumn Quarter of the third year). A student who, on the judgment of his/her *Advisory Committee*, is ready to take the *Candidacy Examination* should notify the *Graduate Counselor* by the end of the second week of the quarter in which the examination is to be taken. Although the normal time for the examination is in the Spring Quarter of the second year, students can ask to take the examination as soon as they feel ready. **The oral part of the exam is scheduled by agreement between the student and the *Advisory Committee*.** A common practice is for the oral exam to be scheduled within a few weeks after the written exam, but the *Advisory Committee* has discretion to make other arrangements so long as the oral part of the examination is taken no later than the Autumn Quarter of the third year.

The *Advisory Committee* decides if the results of the *Candidacy Examination* merits a pass, a conditional pass, or fails on any or all parts (written, oral, prospectus). A conditional pass, which is not uncommon, occurs when the *Advisory Committee* recommends that the student be admitted into candidacy on the understanding that a particular deficiency made evident by the exam results will be corrected in the next quarter or two. **A student who fails to pass the *Candidacy Examination* the first time it is taken may continue in the graduate program by consent of his/her *Advisory Committee*, or the student may petition the *Department Chairman* to form a new *Advisory Committee*. If the student is allowed to retake any part of the exam, this must be done no later than the Spring Quarter of the third year. Two failures on any part of the *Candidacy Examination* will bar the student from further efforts to gain admission to candidacy.**

The Doctoral Candidacy Program

Upon passing the *Candidacy Examination* the student is eligible to apply for admission to *Candidacy* for the Ph.D. degree. This step is governed by regulations of the *Division of the Physical Sciences*, administered by the *Divisional Dean of Students*. *Candidacy Application Forms* are available from the *Department Graduate Student Services Office*.

The regulations governing admission Candidacy are as follows:

“Application should be submitted by the student to the *Chairman of the Department* to obtain a recommendation for admission to *Candidacy* and the subsequent approval of the *Dean of Students in the Division* at least eight months before the final examination for the degree. Responsibility for fulfilling the requirements for candidacy and for filing the application at the proper time rests entirely with the student. The approval of the application certifies:

1. That the candidate has begun the investigation for a dissertation and that an approved title has been submitted.
2. That the candidate is recommended to *Candidacy* for the Doctor's degree.
3. That the candidate has satisfied the foreign language reading requirement of Department [where applicable].”

If a student wishes to carry out a portion of the *Candidacy Program* while not in residence at the University, a written petition to this effect must be submitted to the *Dissertation Committee (defined below)*, with evidence that proper facilities and conditions for the off-campus work will be available.

Annual Progress Reports

Annual Report requirements during *Candidacy* are the same as in the *Precandidacy Phase*.

Residency Requirements

The minimum duration of the candidacy program is three quarters, and the total minimum duration beyond the Bachelor's degree is nine quarters of full-time registration. The student must register for at least three courses each quarter of residence, including the Summer Quarter if research is conducted at the University during that quarter. Portions of this residency requirement may be waived up to a maximum of nine courses (three quarters) by equivalent work at other institutions or in other units of the University.

Dissertation Committee

Shortly after being advanced to *Candidacy*, the student should engage members of the faculty to form a *Dissertation Committee* for advice and supervision of the dissertation. The *Dissertation Committee* is chaired by a *Dissertation Advisor* who is usually, but need not, be the student's previous *Permanent Advisor*. The *Dissertation Advisor* is joined by at least two, but frequently more, other faculty members. The *Dissertation Committee* may be, but need not be, the same as the *Advisory Committee*. A majority of the members *Dissertation Committee* must be faculty members of the Department of the Geophysical Sciences; others may be faculty or persons with equivalent rank from other academic units of the University or other institutions, or permanent University of Chicago researchers of Senior Research Associate rank or higher. Every student is required to meet with his/her *Dissertation Committee* at least once every academic year.

Dissertation

A Ph.D. dissertation, approved in the manner described below, is the key requirement to be fulfilled before the Ph.D. degree is granted. It is a document that makes a comprehensive and original argument for a particular thesis. It should address a major scientific issue or question as a continuous narrative, or as a set of related, modular chapters suitable for separate publication, in which case it must have an introductory chapter relating those individual chapters to the larger issue being addressed. Timely publication of scientific results is encouraged as a valuable component of a student's training. It is common that published work involve collaborative efforts between the student and other scientists and/or the *Dissertation Advisor* and in some fields of study such collaborations are essential for producing important scientific results. However, only those parts of the previously published works (especially when involving multiple authors) that are appropriate for inclusion in the PhD dissertation are those involving

original contributions attributable to the student. Individual chapters of the dissertation are often given to the members of the *Dissertation Committee* for review as those chapters are completed and approved by the *Dissertation Advisor* for distribution. **When the *Dissertation Advisor*, has determined that the full dissertation is ready, or very close to being ready for the candidate to defend his/her dissertation before the full *Dissertation Committee*, the student will submit a complete draft copy to each member of the Committee and schedule a meeting for discussion. All members of the *Dissertation Committee* should be given at least two full weeks to review this material before the meeting. This meeting must take place before the beginning of quarter in which the student hopes to complete the thesis defense and graduate with the PhD degree. At this meeting, the *Dissertation Committee* will determine if the dissertation is acceptable for fulfilling the requirement of the PhD degree, and if necessary, recommend revisions. Once the *Dissertation Committee* agrees by a majority vote that the dissertation fulfills the requirement of the PhD degree, or will with a limited number of specific additions or revisions, the candidate will be given approval to schedule a *Public Dissertation Defense* (see discussion below) early during the next quarter and to submit, having made the requested revision, a draft of the dissertation to the *Dissertation Secretary of the University*. The PhD degree can only be granted after the *Dissertation Secretary of the University* has approved the format of the dissertation. That officer is willing to review a draft of the dissertation to determine whether it meets the format requirements, thus expediting approval of a final copy of the dissertation. **The University regulations state that the final copy of the dissertation must be submitted to the *Dissertation Secretary* no later than four weeks before convocation.** Failure to meet this deadline will result in removal from the *Convocation List* for that Quarter. The *Public Dissertation Defense* thus needs to be scheduled with sufficient time to allow for revisions to content and format that might be required for final acceptance by the *Dissertation Committee* and by the *Dissertation Secretary of the University*.**

Public Dissertation Defense

Once the *Dissertation Committee* has accepted the dissertation, the candidate can schedule a *Public Dissertation Defense*. At the public defense the candidate presents a talk, usually about an hour in length, on the subject and major conclusions of the dissertation. All members of the Department are welcome to attend. **After a period for questions from the general audience, the *Dissertation Committee* convenes for a private discussion of the dissertation and the candidate is then called in for a *Final Examination*.** Any member of the faculty who wishes to attend this *Final Examination* may do so, although in a nonvoting capacity. This *Final Examination* is oral and focuses mainly with the subject of the dissertation and the field of specialization. The candidate should fill out the *Report of Final Exam* form, obtained from the *Department's Graduate Student Services Office*, prior to the exam. Upon successful completion of the *Final Examination*, the *Report of Final Examination* is signed by members of the *Dissertation Committee*, and returned to the *Graduate Student Services Coordinator*.

Convocation

An *Application for a Degree* must be submitted the first day of the quarter in which a student expects to graduate. The *Application for a Degree* is valid only for the Quarter for which it is made. If the degree is not granted at the end of the Quarter in which it was expected, the student must reapply before the deadline of the next quarter. Applications

withdrawn by the end of the first week of the quarter will not be assessed the cancellation fee, however after the first week the University will charge a *Degree Cancellation Fee* as listed in the Time Schedules.

Students who expect to receive a degree must have fulfilled all financial obligations to the University by the end of the ninth week of the quarter in which they expect to receive a degree. Students who fail to meet this obligation will be removed from the list of degree candidates and must re-apply for a degree after settling their accounts. Students who have questions or wish to make special arrangements for payment should make an appointment with the *Bursar* well in advance of the deadline for fulfilled the financial obligations.

Review of candidacy

A candidate who has not completed a dissertation within three years after admission to candidacy must submit an annual written petition to the *Department Chairman* for renewal of candidacy, giving an expected date for completion of the degree. If, after discussion with the student and the *Dissertation Committee*, there is insufficient evidence of progress or likelihood of completion in a reasonable time frame, the student may be advised to discontinue work, and registration for future academic quarters may be denied and candidacy revoked.

Leave of Absence

Leave of Absence from the Ph.D. program is governed by University policy and requires approval from the *Dean of Students*. Students wishing to request leave should consult *The Student Manual* (at studentmanual.uchicago.edu).

Withdrawal

Graduate students who decide to discontinue their studies must see the *Department's Graduate Student Services Office* to complete *Withdrawal Forms*.

The Master of Science Degree

The Department offers a Master of Science degree. The divisional requirement for the degree of Master of Science is nine courses. In addition the Department requires:

1. Approval of the departmental counselor and an individualized program of study.
2. A minimum of nine courses of which at least three must be graduate level courses in the Department, at least three additional graduate level courses in either the Physical Sciences Division or the Biological Sciences Division, and at least one reading and research course. The balance of course work can be either at the graduate or advanced undergraduate level.
3. An average grade of B and no grade less than C in courses offered for the degree.
4. An essay, thesis, or publication demonstrating competence in research or the ability to organize a body of scientific knowledge to derive appropriate conclusions.
5. A seminar delivered to a general departmental audience.

A master's degree is not required for work towards a PhD degree, but a student can request a Masters Degree at any point upon meeting the requirements. The requirements for the M.S. degree may be completed concurrently with the *Precandidacy Phase* of the Ph.D. program. The minimum time for completion is three quarters, but with allowance for research and writing, the more normal time to completion is four to seven quarters. The student must submit an *Application for a Degree* in the quarter in which he/she expects to graduate. The deadline for

the application is the first day of the quarter. Additionally, the student's *Permanent Advisor* or *Dissertation Advisor* must submit a signed *Masters Degree Form* stating that all requirements have been met prior to the final Convocation deadline of the quarter in which the student will receive the degree. It is the responsibility of the student to check with *Student Services Coordinator* regarding all relevant deadlines involved in applying for a degree.

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