

Environmental science Ph.D. Student Handbook

**Department of Earth & Environmental
Sciences
Rutgers-Newark**

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Introduction

Doctoral programs normally are arranged in two phases. In the preliminary phase, the student usually pursues courses of study whilst initiating their research (early stage research). This phase is completed when the qualifying examination is passed. In the second part, the student usually pursues an intensive research program and completes only courses of research (advanced stage research). It is concluded when the dissertation has been accepted and the defense of it approved.

The Ph.D. student must advance successfully through (1) a Qualifying Exam, (2) a Technical Defense of the Thesis Proposal, (3) a Public Dissertation Defense, and (4) a Technical Defense. It is critical that the student choose a Major Research Advisor (MRA) and tentative research project during the first semester in residence.

This is a research-oriented degree intended for full-time students. Although courses may be taken on a part-time basis, a minimum of one year of full-time residency normally is required for completion of the doctoral dissertation.

Formation of Dissertation Committee

By the end of the second semester, the MRA, in consultation with the student, will appoint a Dissertation Committee (DC). The minimum and usual number of members of the DC is four. . As a minimum, the committee must consist of the doctoral student's dissertation adviser, and three additional faculty members from the program or experts from outside institutions. At least one member (including the DC Chair) must be a full-time assistant, associate or full professor from the Department of Earth & Environmental Sciences. The additional program members are not required to be from the Department of Earth & Environmental Sciences. At the discretion of the MRA, one postdoctoral scientist in the Department of Earth & Environmental Sciences may also serve on the committee. The DC may change the faculty representatives on the committee as the student re-defines interests or research.

The MRA is responsible for helping the student define an appropriate program of study based on the courses offered within the program. As the program offers a diverse range of classes between the Rutgers-Newark, Rutgers-New Brunswick and NJIT offerings that vary by semester, the MRA will advise the student on appropriate courses to support their research on a per semester basis. The student may not deviate from the courses to be taken unless given approval in writing from the MRA. A student may neither add nor drop a course, for example, without specific approval in writing of the MRA. If any difficulties with the program are encountered (e.g., failing a course and wishing to drop it, or feeling the course load is too heavy), the student must arrange a meeting of the MRA to consider the matter.

Ph.D. Program Progress Monitor Form (PMF)

During each semester the student must arrange a progress review meeting of the DC. At this meeting the Ph.D. Progress Monitor Form (PMF) will be completed and signed by the student and MRA. This form provides a record of advisement, intended and completed coursework, proposal topics, thesis proposal defense, and the proposed dates of the technical and public defense of the thesis. The completed PMF is returned to the Graduate Program Director (GPD) to be filed in the student's folder as confirmation of the student's progress toward the degree objective and must be updated by the DC every semester. Failure to follow the above requirement will result in a "hold" being placed on the student's university record preventing further course registration. The hold will not be removed until the PMF is completed and turned in to the office. The PMF must be returned to the office prior to December 1st for the Fall semester and May 1st for the Spring semester. Satisfactory progress toward the degree, as determined by the PMF, is required at all times. Students who fail to make satisfactory progress may be informed of their problem by their PMF chairperson, department chairperson or by their school dean.

Formal Course Work

Formal course work is defined as 'actual classes' taken. This does not include seminars or courses numbered 26:375:701 and 26:375:790. A list of all courses the student takes each semester must be approved by their MRA and attached to their PMF. This list will define an evolving program of study. A minimum of 24 formal course credits is required for the Ph.D. degree for students who have entered the program with a Masters degree and 42 credits for those students entering without a Masters degree.

A full-time normal academic load is defined as 9 or more credits per semester. A load of 18 credits or more requires the approval of the Dean of the Graduate School–Newark. For most purposes, a student who has registered for 9 or more credits has full-time status, and a student registered for 8 or fewer credits has part-time status. The following students must register for a full-time program of 9 or more credits: graduate fellows, research interns (some credits must be associated with degree related research), and graduate and teaching assistants. Fellows, interns, and assistants must register their appointments according to the appropriate designations in the *Schedule of Classes*. In addition to regular course work, the following also are included in the calculation of credits: research courses, regular courses taken not-for-credit, and graduate and teaching assistantships (usually 6 credits each). Graduate and teaching assistants must remain in good standing in their own programs. In addition to their half-time academic appointments, assistants are required to register for **a minimum of 9 credits of course work or research, which qualifies them for full-time status.**

Incoming students should be full time students in order to prepare for admission to candidacy for the degree as soon as possible and to allow for registration for thesis research during later semesters. The student is encouraged to become involved in the thesis research topic as soon as possible after enrollment.

Student Type	Full - Time		Part - Time
	Min. Credit Hrs	Max. Credit Hrs	
Non Assisted Students	12	18	8 Hrs or Less
Teaching Assistants	9	12*	Not Allowed
Research Assistants	9	12*	Not Allowed

**more than 12 credit hours requires the approval of the Dean of the Graduate School*

Before the student finishes the minimum of 24 formal course credits, he/she can register under 26:375:701 *Environmental Science Research (Graduate Research)* to replace the formal courses to keep his/her full-time status. When performing actual research for the thesis or dissertation and writing the thesis, after research is completed, register under 26:375:790 *Doctoral Dissertation (Thesis Guidance)*. Unsatisfactory progress on thesis research will result in a grade of “U” and may be grounds for dismissal from the degree program. Once seventy-two (72) credit hours have been successfully completed, registration of one hour is all that is required. For those students who have reached this stage of their degree program, certification of full time status may be requested. If a student leaves the university before receiving the degree, he/she must maintain continuous residency by registering for at least one (1) or more credit hours of research each semester until the degree is conferred.

Students are required to take a minimum of 36 credits of 26:375:790 Doctoral Dissertation and to register every term for 26:375:600 Environmental Science Seminar. Should a student complete the 36 credits of 26:375:790 before submitting his or her final dissertation document, this student must register each term for a minimum of 3 credits of 26:375:790 until the document has been submitted and accepted.

Maximum Time Allowance

The Graduate School sets a maximum of seven (7) years and a minimum of three (3) years for full-time students to get a Ph.D. degree from the date of initial registration into the program and a maximum of eight (8) years and minimum of four (4) years for part-time students. Three years is the expected time for a student with a Master's degree to complete a Ph.D., four years if the student has not received a Master's prior to admission to the program. Students in the Ph.D. program who have not completed the requirements for the degree at the end of five years will be sent a warning letter from the PMF pointing out the University's seven year deadline for the degree, and noting that unless the student finishes at the end of ten semesters, he/she will have failed to maintain the expected rate of progress. At the end of six years essentially the same letter will be sent. During the 12th semester an *ad hoc* committee (the MRA is not a member of the committee but is the presenter of the case) will formally review the case. A schedule for completion of the remaining major requirements prior to the end of the 14th semester is

communicated to the student. Near the end of the 14th semester the committee will hear reasons, if any, not to expel the student at the end of that semester. A decision is required. This procedure is to be repeated every semester thereafter.

Academic Grade Requirements

Candidates for the Ph.D. degree are expected to earn grades of B or better in their course work. No more than 12 credits with a grade of C or C⁺ are allowed. The student must maintain a minimum grade of B in the required courses, and a minimum overall grade of C in all courses. The Graduate School-Newark requires that all students maintain a minimum cumulative B average during each term of study in order to remain enrolled. If a student's academic performance falls below the expected standard, the program or the school may review the record and make recommendations concerning that student's future registration in The Graduate School-Newark.

Satisfactory Progress

The lack of satisfactory progress in either coursework or research will be noted on the PMF. After two consecutive semesters of unsatisfactory progress, a hearing will be held to determine if the student should be terminated from the Earth & Environmental Science department. The department Chair will organize this hearing, (unless the MRA is the department Chair, in which case, the second most senior member of the department will be chair). The hearing will include comments made by the student and the student's MRA.

In addition to the academic grade requirements note above, the lack of satisfactory progress in either coursework or research will be noted on the PMF. After two consecutive semesters of unsatisfactory progress, the DC may make a unanimous written recommendation to the GPD that the student be dropped from the degree program. If the GPD concurs, the student will be notified in writing that he or she has been dropped from the Earth & Environmental Sciences graduate degree program.

Earth & Environmental Sciences Seminar Series

In an effort to familiarize students and faculty with current research by specialists in the broad field of Earth & Environmental Sciences, the Department frequently schedules lectures presented by visiting scientists as well as members of this and other departments at Rutgers-Newark. Students must attend the seminar and actively participate in discussions in order to fulfill the credit requirements of 26:375:600 each semester when offered. The students who are working as GTA can be exempt from this requirement when the seminar conflicts with their teaching or normal experiments.

Degree Requirements

The Doctor of Philosophy degree is a research degree and is awarded as a result of the successful completion of a scientifically significant and unique research project, presented in the form of a Ph.D. dissertation. It is the student's responsibility to ensure that all degree requirements are met in a timely fashion. Regular updating of the PMF is implemented to assist the student towards this goal. The Graduate School has several stringent requirements regarding time. These deadlines are strictly enforced and failure to

meet them will result in a delay of graduation by one whole semester with the cost of continued registration. The requirements involve the following:

- Continuous registration (“matriculation continued” counts) including the semester in which all degree requirements are completed, whether the student is on campus or not (continuous registration in every fall and spring term thereafter until completing the program and earning the degree)
- Maintain a minimum overall GPA of 3.0; and no more than 12 credits with a grade of C or C+
- Seventy two (72) credit hours (60 credits for those entering with an MS degree) have been successfully completed
- Take a minimum of 36 credits of 26:375:790 *Doctoral Dissertation*. If a student should complete the required 36 credits of 26:375:790 before the final dissertation is accepted, he or she must register for a minimum of 3 credits of 26:375:790 for each semester until the dissertation has been submitted and accepted
- Register every term for 26:375:600 earth and environmental science seminar offered
- Have completed at least 24 credits of course work beyond a master’s degree. No more than 6 credits may be in 26:375:725, 726 independent study.
- Submission of Application to Candidacy to the Graduate School prior to deadlines listed below:

<i>Diploma Date</i>	<i>Diploma Application Deadline</i>	<i>Degree Requirements Deadline</i>
October	October 2	October 2
January	January 2	January 2
May/June	April 2	May 2

The Qualifying Exam

Within three terms of their admission to the program, doctoral students must pass the qualifying examination. A student is allowed only two attempts to pass this examination. The examination is conducted by a DC of at least four members or adjunct members of the graduate faculty, and the chairperson must be a full member. It is designed as a comprehensive measure of a student’s knowledge, the examination is both written and oral.

There are two options for the qualifying or comprehensive examination as determined by the MRA, DC and student.

- 1) Four (4) questions, one from each member of the DC, requiring a written response and designed to take approximately 2 hours each. Two weeks after the written examination, an oral examination of approximately two hours will be conducted by the DC.
- 2) Preparation of a written research document that includes primary data tied to professional literature may be submitted to the DC. Two weeks after submission, an oral examination of approximately two hours will be conducted by the DC.

Students must obtain a candidacy form from the graduate school or online prior to the qualifying exam and complete all of the requested information. Once the exam is completed, the DC must render a decision in writing and the form must be endorsed by the GPD. The form is then submitted to the graduate school. Upon satisfactory completion of the qualifying examination and acceptance by the Graduate School, the candidate will be formally accepted into the research phase of the graduate program. Unless accepted into this standing, the candidate is ineligible to proceed with the research part of the degree program.

Dissertation Proposal

Within four terms of their admission to the program, each doctoral student must make a formal oral presentation on the scope of his or her proposed research to members of the DC and to any other interested persons. Within one month of this presentation, the committee members must approve formally a dissertation proposal. This time frame ensures that students have an approved dissertation proposal within one year of entering the program.

A well thought out and fairly detailed proposal is NOT to exceed ten (10) normal double-spaced pages of text. Figures, extensive sets of equations, and literature references are not included within the ten-page limit. Background/context of the research, techniques of data collection to be used, methods of analysis of the data collected, nature of results to be expected, and the significance of the research should be included. The purposes are to determine whether the student has thoroughly prepared to undertake the thesis research proposed (and if not, to learn what remediation or enhancement of preparation is necessary) and whether the proposed research appears to be acceptable for the Ph.D.

After the DC approves a preliminary version of the thesis proposal (augmented as appropriate) the student will defend it before the faculty including (but not limited to) the DC, which may be augmented as is deemed appropriate in each particular case. In any case, all faculty of the Department of Earth & Environmental Sciences must be advised by written notice of the nature and time of this defense. The faculty present may question the student on any aspect of science germane to the research topic.

The decision of the examining committee (i.e. all faculty present during the defense) will be HIGH PASS, PASS, CONDITIONAL PASS (with the conditions being specified and summarized in writing, including a timetable for completion of the conditions if deemed appropriate), FAIL/RE-TAKE (with advice given to inform the

student as to what the major deficiencies were and a timetable for re-examination), and FAIL (dismissal from the program). In accordance with the Ph.D. PMF, a proposal must be approved by the fourth semester of the program. When approved, the MRA will place a copy of the proposal (marked with the date of approval and his/her signature) in the student's file. Students should be sure their files have a copy on record.

The Dissertation

The dissertation serves several related educational functions:

- It is beneficial for acquiring competence in certain of the analytical techniques of the earth & environmental sciences;
- It provides practice in application of the scientific method;
- It gives practice in making accurate descriptions of observations, and in giving clear, concise expression of ideas in writing

The final draft of the dissertation should be prepared in strict accordance with the instructions given in the pamphlet *Thesis and Dissertation Form*, which is available at the Office of the Dean of the Graduate School–Newark. After the committee has accepted the dissertation, the student must file the original and one copy with the Office of the Dean of the Graduate School no later than the announced deadlines for completion of degree requirements.

With the dissertation, the candidate is required to submit an abstract, *not exceeding 350 words*, which describes the principal finding of his or her research. As with the dissertation, the professor in charge of the work for the dissertation also must approve the abstract, and other members of the student's committee must accept it.

Dissertations must contain a minimum of three (3) chapters. Each of the chapters should be prepared as a professional paper and submitted to professional peer-reviewed international journal. Two (2) of the chapters must be accepted for publication or published by the time the student defends their dissertation. The third chapter must be submitted to a journal for review by the final defense but it does not need to be accepted.

The department encourages students to take the initiative in selecting a dissertation subject and in designing their research methods. The suitability and practicality of the selected subject is to be discussed with, and approved by, the MRA before the dissertation proposal is submitted to the department for consideration.

External members of the committee (outside readers)

External members of the committee provide an independent evaluation of the student's research. Outside readers are qualified individuals appointed outside the student's department who normally hold the highest degree in his or her respective field. The outside reader should be carefully chosen to avoid potential conflicts of interest and to include professionals of the highest prominence possible within the particular field. At least one outside reader is recommended to serve on the thesis committee.

The Technical Defense

The Technical Defense Examining Committee will comprise the DC and, whenever possible, include the outside reader. If the research incorporates significant subject matter that is outside the expertise of the DC, the examination committee should include other faculty from the Earth & Environmental Science Department, or if necessary another department, who can evaluate this component of the candidate's project.

The Technical Defense, as defined here, is a special meeting of the candidate's Ph.D. committee at which the student presents the research results for detailed scrutiny. The principal goal of the technical examination is to evaluate whether the candidate has conducted research and obtained results that are likely to be reliable, of substantial scientific importance, and will satisfy the requirements for the degree. The active involvement of the entire DC in the evaluation of the candidate's research at this stage accomplishes two important goals: (1) it enables the DC to provide guidance about the scope of the project; (2) it enables the candidate to make substantial changes, if needed, to the thesis. The student must provide, as preparation for the technical examination, copies of the dissertation to all DC members and the department office for public inspection **at least two weeks prior to the defense.**

The timing & qualifications for the technical defense include:

A. Written Documentation - Two weeks prior to the technical examination, the candidate must circulate to the department and the DC a copy of the dissertation and an abstract of the major contents and conclusions. At the examination this thesis, supplemented by visual aids the candidate believes are appropriate, will form the basis for the presentation and discussion. The examination may also incorporate written questions about these documents from faculty not on the examining committee.

B. Presentation - The candidate should be prepared to present the following at the technical defense:

- 1. Background and goals of the project.*
- 2. Methods of data collection and some representative data.*
- 3. Methods of analysis and major results for work completed and projected.*
- 4. Discussion of outstanding tasks and problems for future research in the field.*
- 5. Summarize the conclusions.*

C. Duration - This presentation should take 45 to 60 minutes. The examining committee will question the candidate about all aspects of the research, as they see fit. In total, the technical defense should occupy no more than two hours.

The examining committee, by consensus, will grade the examination as a pass, conditional pass, or fail. These outcomes and their consequences are defined as follows:

Pass: The technical examination of the thesis indicates that the candidate possesses a mastery of the subject. The research is of high merit and the candidate is approved for the Ph.D. degree. **To receive final approval, students must obtain signatures from all members of the dissertation committee.**

Conditional Pass: The degree of technical mastery is as for Pass but significant portions of the thesis need modest revision or reconsideration. The current thesis does not assure a successful completion prior to the candidate's intended date for submission of the dissertation, but this outcome is likely if the candidate carries out the needed revisions. The committee will suggest remedies for the deficiencies (if possible), and set a specific timetable for their completion. This work may cause a delay in graduation. A repeat of the technical examination is unnecessary.

Fail: The student did not display a sufficient mastery of the field; major problems exist with the research that require extensive revision and reconsideration. These deficiencies indicate that it is almost certain the work will not be or could not be successfully completed before the intended date of graduation. The DC may permit a repeat of the technical examination or may recommend to the department that the student is dismissed from the doctoral program. If permitted to repeat the examination, the DC will fully advise of the needed changes and will set a specific timetable for execution of the work. The student must repeat the technical examination within one year of the failed attempt. If they do not receive a pass or conditional pass on the second attempt, the DC again may give directions for revision or may recommend dismissal from the program. Any student who is unable to complete the requirements for the Ph.D. degree may become a candidate for the master of science in environmental science once he or she meets the requirements for that degree.

The Public Defense

A final public examination is held under the auspices of the committee in charge of the candidate's course of study. At this examination, the candidate must defend the dissertation and otherwise satisfy the committee and other faculty members in attendance that he or she is qualified to receive the degree of doctor of philosophy.

The MRA, in consultation with the student and other DC members, is to arrange a place, date, and time for a public defense. The date and time of the defense must be at least two weeks prior to the Graduate School's deadline for all materials to be submitted. A memo prepared by the department office staff detailing this information is to be posted and circulated to all faculty members a minimum of ten (10) working days before the defense is to be held. A copy of the thesis must be placed in the department office at least ten (10) working days before the defense for faculty perusal.

Public defenses may be undertaken at any time of the year providing the DC and the student can agree on a time. Students should be aware that difficulties may arise during exam times and during the summer months. Graduate School requirements with regard to continuous registration and time limits for degree completion are of particular importance to students leaving the university before all requirements have been completed.

At the time of the final examination, the student is responsible for obtaining from the Office of the Dean the candidacy application upon which the result of the qualifying examination is recorded. The committee members complete this application at the final examination and sign the title page of the dissertation to signify their acceptance of it.

Once the GPD certifies that all program requirements have been completed for the degree of doctor of philosophy, the candidate must return the candidacy application to the Office of the Dean. Additional materials to be submitted include one original and one photocopy of the dissertation on 100 percent cotton-content bond paper, two copies of the title page and abstract, the receipted payment form for microfilming, the microfilming agreement form, and additional survey forms as required. All of the above materials must be submitted to the Office of the Dean no later than the announced deadlines for completing degree requirements. The names of those failing to meet these deadlines are removed automatically from the commencement list for that degree date. One copy of the dissertation on regular paper must be provided to the department as well.

Publication of Dissertation and Academic Data

After it grants the doctorate, the Graduate School–Newark has the dissertation microfilmed. The dissertation must therefore be prepared for this purpose with the same care as if it were to appear in printed form. The abstract that must accompany the dissertation also must be ready for publication when it is submitted to the Dean, as it will be published in *Dissertation Abstracts*. University Microfilms of Ann Arbor, Michigan, microfilms the dissertation and publishes the abstract. Information on how to prepare the dissertation and abstract and the agreement with University Microfilms, which the candidate must sign, are available in the Office of the Dean. The fee for microfilming the dissertation and publishing the abstract is \$71.50. Registration of copyright also is available for a fee of \$45.00.

You are responsible for obtaining up-to-date information on the accepted form and organization of the dissertation, including headings, references, and scientific writing in general. Major Thesis Advisors will require a well-organized format before examining the thesis for content.

GRADUATION

When entering their final term, candidates who anticipate faculty recommendation for conferral of the degree are required to follow the procedures listed below.

1. Ensure that all academic requirements have been or will be completed.
2. Make certain that related fees and any outstanding debts to the university are paid.
3. Submit an application for admission to candidacy.
4. Submit a diploma application. The degree cannot be conferred as scheduled and graduation will be delayed if this form is filed after the deadline. If the deadline passes, students will have to refile this form.

It is the responsibility of the student to complete all requirements for graduation by the scheduled dates listed. Each student should consult with the GPD of his or her program and with the Office of the Dean of the Graduate School–Newark with respect to the completion of the requirements for graduation. Conferral of degrees and diplomas occurs once a year at the annual spring commencement. Students who file the applications and complete all other requirements for the degree by the announced

October or January dates will have a diploma dated for the respective month, although they will not receive it until the following spring. To provide proof that they have earned a degree before commencement, students may file a written request for a temporary certificate of completion with the Office of the Dean of the Graduate School–Newark. The school withholds diplomas from any student who is under financial obligation to the university.

PROGRESS AND REVIEW FORM (PRF)

Environmental Science Ph.D.

<p>First Semester:</p> <p>_____ GPA Greater than 3.0</p> <p>_____ Advisor Meeting</p> <p>_____ Dissertation committee formed</p> <p>_____ Dissertation Proposal Approval</p> <p>_____ Qualifying Exam (BS)</p>	<p>Second Semester:</p> <p>_____ GPA Greater than 3.0</p> <p>_____ Advisor Meeting</p> <p>_____ Dissertation committee formed</p> <p>_____ Dissertation Proposal Approval</p> <p>_____ Qualifying Exam (BS)</p>
<p>Third Semester:</p> <p>_____ GPA Greater than 3.0</p> <p>_____ Committee Meeting (MS)</p> <p>_____ Qualifying Exam (BS)</p>	<p>Fourth Semester:</p> <p>_____ GPA Greater than 3.0</p> <p>_____ Committee Meeting (MS)</p> <p>_____ Dissertation Proposal Approved</p>
<p>Fifth Semester:</p> <p>_____ GPA Greater than 3.0</p> <p>_____ Committee Meeting</p>	<p>Sixth Semester:</p> <p>_____ GPA Greater than 3.0</p> <p>_____ Committee Meeting</p> <p>_____ Application to candidacy</p> <p>_____ Technical Defense</p> <p>_____ Public Defense</p>
<p>Seventh Semester:</p> <p>_____ GPA Greater than 3.0</p> <p>_____ Committee Meeting</p> <p>_____ Application to candidacy</p> <p>_____ Technical Defense</p> <p>_____ Public Defense</p>	<p>Eighth Semester:</p> <p>_____ GPA Greater than 3.0</p> <p>_____ Application to candidacy</p> <p>_____ Technical Defense</p> <p>_____ Public Defense</p>

GRADUATION CHECK LIST (IN ORDER TO GRADUATE)

Environmental Science Ph.D.

An approved Application to Candidacy (with all necessary attachments, including original transcripts)
Electronic submission of the dissertation to the Graduate School
Compliance with the Graduate School regulations regarding degree conferral
One hardbound <i>and</i> CD copy of thesis to the department.
One hardbound or CD (at the discretion of the advisor) copy of thesis to your thesis advisor.
One softbound or CD (at the discretion of the faculty member)of the copy to each faculty member serving on your committee
One unbound copy of the dissertation
One extra copy of title page and abstract (less than 350 words)
Graduate School Billing Form