

Environmental Science: MS Student Handbook

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

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*For questions about this handbook contact Dr. Adam Kustka
(kustka@andromeda.rutgers.edu)*

Environmental science M.S. Student Handbook

A minimum of 30 degree credits are required to obtain an MS degree in Environmental Science. Candidates must consult with the Graduate Program Director (GPD) in designing appropriate programs of study. Otherwise, candidates can choose a thesis instead of 6 credits of course work. In this case, the program of study is designed in consultation with the candidate's Main Research Advisor (MRA). The thesis option is **required** for those students who receive departmental or researched-based support. If candidates choose a thesis, the procedure is similar to the Ph.D. program.

Formation of Advisory Committee (AC)

If a program of study includes a thesis, an Advisory Committee (AC) oversees the course selection, research for the thesis, and the conduct of the final examination. The AC is made up of at least three members including the MRA. Outside members who are experts in the field of study may also serve on the committee at the discretion of the MRA and GPD.

The GPD assists candidates in selecting an initial program of study during the first semester if they do not have an MRA or AC. This advisor will help the candidate select a permanent MRA and AC that will recommend and approve a program of study. At least one member of the AC must be a full-time assistant, associate or full professor from the Department of Earth & Environmental Sciences. The additional members are not required to be from the department, and may include assistant, associate, full, emeritus, or adjunct professors at Rutgers University (Newark or New Brunswick campus) or New Jersey Institute of Technology (NJIT), as well as outside members who are experts in the field of study. At the discretion of the MRA, postdoctoral scientists in the department may also serve on the AC. The AC may change members as the student re-defines interests or research or if a faculty member is on leave during the tenure of the candidate. Either the AC or the student may initiate such changes, but the pre-existing AC must approve the change.

The MRA or GPD will advise the student regarding a course of study, then certify in writing that the student has fulfilled his/her degree requirements. If the student completes the thesis option, the MRA will advise him/her until he/she has successfully completed the defense of the thesis examination. It is the student's responsibility to ensure that all degree requirements are met in a timely fashion. In particular, the Graduate School has several stringent requirements regarding time of submission of the Application to Candidacy. 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.

M.S. Program Progress Monitor Form

During each semester, candidates pursuing the thesis option must arrange a progress review meeting of the AC. At this meeting the M.S. Progress Monitor Form (PMF) will be completed and signed. This form provides a record of advisement, intended and

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completed coursework, ***proposal topics, thesis proposal defense, and the proposed dates of public defense of the thesis (for these students who do thesis)***. The completed PMF is returned to the 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 AC every semester. MS candidates who choose the non-thesis option, must meet with the GPD every semester. They must also complete a PMF as a result of this meeting which is filed in the student’s permanent records.

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 submitted to the GPD. The PMF must be returned to the GPD 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 MRA, GPD or by the dean of the graduate school.

The department has an assessment plan in place that is used to evaluate the progress of all students. This plan is included at the end of this handbook.

Formal Course Work

Formal course work is defined as ‘actual classes’ taken. A minimum of 30 degree credits is required for graduation. This does not include seminars or courses numbered 26:375:701 and 26:375:790 in excess of those permitted in the program. A list of all courses taken by the student must be approved by the AC and attached to the PMF. This list will be the program of study.

A full-time normal academic load is defined as 9 credits. 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. In addition to regular course work, research courses and regular courses taken not-for-credit also are included in the calculation of credits.

Student Type	<i>Full – Time</i>		<i>Part – Time</i>
	<i>Min. Credit Hrs</i>	<i>Max. Credit Hrs</i>	
Non Assisted Students	9	18	8 Hrs or Less
Graduate Research Assistants	9	18	N/A

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

If the candidate chooses a thesis option instead of course work, when performing research for the thesis, registration for 26:375:701 *Environmental Science Research*

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(*Graduate Research*) is required. Once twenty-four (24) credit hours of course work has been successfully completed, registration for one credit is all that is required to be matriculated. For the student who has 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.

Core courses

M.S. in Environmental science:

Required Courses (15 credits)

- EM 631 Legal Aspects in Environmental Engineering *or* 26:380:576 Environmental Geology
- EvSc 610 Environmental Chemical Science
- EvSc 612 Environmental Analysis
- EvSc 616 Toxicology for Engineers and Scientists
- 26:120:604 Microbiology: Principles and Applications *or* EvSc 627 Environmental Microbiology

Elective courses (9-15 credits) may be chosen from among all graduate courses offered at Rutgers-Newark Department of Earth & Environmental Sciences, Rutgers-New Brunswick Departments of Geological Sciences and Environmental Sciences or from among selected graduate courses offered at NJIT. There are a wide range of courses offered outside Rutgers-Newark that are used to satisfy degree requirements (with approval of the GPD in the case of a non-thesis student, and the MRA in the case of a thesis student). The list of courses is available each semester and is posted on the department webpage.

Students that pursue the research option are exempt from the required courses policy and may instead select courses from the complete list of approved courses in the program in consultation with their research adviser. This option is designed to allow research students to select from the courses that best connect with their research interests. Note that a student who starts the research thesis option but elects to discontinue it will then be subject to the above required course policy.

Thesis

A thesis is required for those receiving departmental or research-based support. Register under EvSc 701 or 26:375:701 Master's Thesis (6). Others may choose 6 credits of approved course work instead of a thesis. In addition to the minimum 30 degree credits required (i.e thesis option), all students who receive departmental or research-based awards must enroll each term in EvSc 600 Environmental Science Seminar when offered.

Maximum Time Allowance

The Graduate School sets a maximum of 3 years and a minimum of 1 year for full-time students to get a M.S. degree from the date of initial registration into the program. There are no related rules of time period for part-time students.

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Academic Grade Requirements

Candidates for the M.S. degree are expected to earn grades of B or better in their course work. No more than 9 credits with a grade of C or C⁺ are allowed. 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 Department of Earth & Environmental Science. The GPD will organize this hearing, (unless the student's advisor is the GPD, 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 MRA or GPD.

If the student fails to defend himself/herself, the AC or departmental committee may make a unanimous written recommendation to the Dean of the Graduate School that the student will be dropped from the degree program. If the Dean 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. ***Student, who receive the departmental or research-based support OR full-time students that choose the thesis option, must attend the seminar (26:375:600) and actively participate in discussions each semester.*** Other students are strongly encouraged to attend this seminar based on their interest, but not required.

Annual Graduate Student Retreat

The department holds an annual 1.5 day retreat for graduate students towards the end of each spring semester. The purpose of this retreat is to foster interdisciplinary interaction among graduate students in Earth and Environmental Sciences and Ecology on the Rutgers Newark campus. It is also meant to be an opportunity to meet in an informal setting to discuss some of the challenges and opportunities of being a graduate research student. Note that this retreat is mandatory for all students receiving financial support (of any kind) from the department. Other students are strongly encouraged to attend this retreat, but not required.

Degree Requirements

- 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)

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- Minimum of 30 credits course work completed
- Maintain a minimum overall GPA of 3.0; and no more than 9 credits with a grade of C or C+
- Submission of Application to Candidacy to the Graduate School prior to deadlines listed below: The student can select option 1 or option 2 in order to complete other degree requirements:

<i>Diploma Date</i>	<i>Diploma Application Deadline#</i>	<i>Application Deadline*</i>	<i>to Candidacy</i>
October	August 1	October 1	
January	November 1	January 4	
May/June	March 1	May 1	

The candidacy application form is at

http://gsn.newark.rutgers.edu/Downloads/Master_candidacy%20NEW.pdf

* Part 1 of the application is to be completed as per instructions and filed with Graduate Dean's office. The application is then collected before the final examination, the necessary signatures obtained and the application returned to the Graduate Dean's office. *ALSO SEE THE GRADUATE SCHOOL REQUIREMENTS FOR MASTERS CANDIDATES AT THE END OF THIS DOCUMENT*

Thesis Versus Non-Thesis Options

The student can select option 1 or option 2 in order to complete other degree requirements:

Option 1:

- Thirty (30) credit hours successfully completed

Option 2:

- Twenty four (24) credit hours of course work have been completed with 15 credits taken at Rutgers-Newark; a thesis is presented for 6 CH of coursework
- Submission of a thesis proposal approved by the AC prior to the end of the second semester of study. A copy signed by the MRA should be placed in the department file
- Completion of a thesis approved by the AC
- Successful presentation of a Public Defense

The thesis option is preferred as it offers a unique graduate-level, research-based learning experience that will give the student an edge in their career development. In particular:

- It is beneficial for acquiring competence in certain of the analytical techniques of the environmental geosciences;

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- It provides the student with 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.

Students who receive departmental or research-based support OR choose a thesis are required to complete these requirements.

Research Topic

The thesis research topic is selected through mutual agreement of the MRA and the student. The most effective topic is one which interests both the student and MRA, and integrates with other ongoing research in the program. Students are advised to talk to several faculty members upon arrival in the department, even if they already tentatively decided on an MRA and thesis topic. The student is not obligated to accept a thesis topic that the MRA recommends, but neither is the MRA obligated to approve any topic that the student recommends. If MRA and student cannot agree upon a topic, the student is free to work with another faculty member if the faculty member is willing. Students should be aware, however, that a graduate research assistantship (GRA) is often directly linked to a student's thesis topic, and that choosing another thesis topic may result in a loss of GRA support.

If a student expects to complete the program in the usual two years, enough background should be acquired during the first year to intelligently pursue a research project during the summer between the first and second years. If the field of specialization is not decided upon, or is changed, and added background for research is required, the student may receive less financial support, or no support at all, for the additional time needed to complete the degree.

The Proposal

Every candidate in the thesis option is required to submit a formal thesis proposal to the MRA, AC and the department. The proposal assures that all parties agree on the scope and details of the thesis project. It is the student's responsibility to circulate this proposal to the AC and the GPD.

The proposal must be approved by the end of the second semester!

The proposal should be written under the guidance of the MRA.

The proposal should be written according to the guidelines: It should begin with an abstract of no more than 300 words and should describe the anticipated research in no more than 7 pages including figures and references. It should present the problem and discuss the plan, objective, approach, and scope of the proposed research.

- Submit the written proposal to the MRA for approval
- Once approved by the MRA, it should be submitted to the remaining members of the AC for approval

In considering the proposal, the faculty will weigh whether the student appears adequately prepared for the proposed research. Revisions may also be advised at this time.

Submission of the Thesis

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For the thesis option, the research topic must be approved by the MRA and accepted by the AC.

Submission of the research article: All theses must be prepared for publication in a peer reviewed journal and submitted for review by completion of the program.

Submission of the thesis to the Graduate School Newark: The final draft of the thesis should be prepared in strict accordance with the instructions at:

<http://gsn.newark.rutgers.edu/Downloads/Master%27s%20Electronic%20Dissertation%20020811.pdf>.

Two signed cover pages on 100% cotton paper must be filed with the dean of the Graduate School–Newark. The student must take this step by the announced deadlines for completion of degree requirements.

Oral Presentation and Defense

The thesis must be defended orally before the AC. Other faculty and students are invited but not required to attend. The student is responsible for arranging the date and time of the Defense which must be at least two weeks prior to the Graduate School's Deadline for all materials to be submitted. There is no set time limit for the defense, but a two (2) hour time slot is usually scheduled. **Note that a defense is rarely held in the summer and that faculty members are under no obligation to agree to such a meeting outside of the official academic year.**

The process leading up to the defense generally is as follows. Once a draft of the thesis has been approved by the MRA (usually after several revisions), the candidate provides the remaining AC members each with a copy. The AC has **at least two weeks** to read the draft thesis and makes written comments. Once the AC approve any required revisions, the oral thesis defense may be scheduled. The date, time, and place of the defense are arranged between the candidate and the AC. Because it may be difficult to schedule a defense with only a few working days notice, the student is advised to arrange a **tentative** defense date at least 1 month in advance. To ensure the student has time to make the necessary revision after the defense, **the defense must be held two weeks prior to the Graduate School's deadline for submitting materials.** 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 draft thesis must be placed in the department office at least ten (10) working days before the defense to allow examination by interested faculty.

A. Presentation - The candidate should be prepared to present the following at the 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.*

B. Duration - This presentation should take 30-40 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.

At the time of the final examination, the student is responsible for obtaining from the Office of the Dean of the Graduate School the MS degree candidacy application. The GPD certifies that all program requirements have been completed for the MS degree. The committee members complete this application at the defense and sign the title page of the thesis to signify their acceptance of it.

When the examination is completed, the thesis committee and other department faculty who are present will determine, in the absence of the student and others that attended, if the oral defense was passed successfully. In the event of failure, the student will be permitted a second oral exam which is to be scheduled in consultation with his committee. Once the thesis defense is completed to the satisfaction of the AC, they must sign the candidacy application form and the candidate must return it to the Office of the Dean of the Graduate School.

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 graduate director 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.

MS PROGRAM CHECKLIST

First Semester: <input type="checkbox"/> Advisor Meeting <input type="checkbox"/> Study Program Approved <input type="checkbox"/> Thesis Proposal Approved <input type="checkbox"/> Advisory Committee (AC) Formed <input type="checkbox"/> GPA Greater than 3.0 <input type="checkbox"/> Degree Progress Form	Second Semester: <input type="checkbox"/> Committee Meeting <input type="checkbox"/> Thesis Proposal Approved <input type="checkbox"/> GPA Greater than 3.0 <input type="checkbox"/> Degree Progress Form
Third Semester: <input type="checkbox"/> Committee Meeting <input type="checkbox"/> GPA Greater than 3.0 <input type="checkbox"/> Degree Progress Form	Fourth Semester: <input type="checkbox"/> Committee Meeting <input type="checkbox"/> GPA Greater than 3.0 <input type="checkbox"/> Degree Progress Form <input type="checkbox"/> Application To Candidacy <input type="checkbox"/> Thesis Defense

Graduation Check List

In order to graduate the following must be on file

_____ An approved Application to Candidacy

_____ Compliance with the Graduate School regulations regarding degree conferral

_____ **Option 1: Final examination**

_____ **Option 2: thesis:**

----- *Electronic submission of the thesis to the Graduate School*

_____ *One hardbound **and** 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*

**Department of Earth and Environmental Sciences Graduate Program in
Environmental Geology and Environmental Science M.S. Degrees: Learning
Goals and Assessment**

The Department of Earth and Environmental Sciences (DEES) Graduate Program in Environmental Science strives to have students complete degrees that allow them to become leaders in their areas of expertise in governmental agencies, non-governmental organizations (NGO's) and industry.

Learning Goal 1 for Students: Mastery of research, scholarship, teaching, and leadership skills in environmental science

Assessment of student achievement of Goal 1:

- Grades in graduate courses.
- Advising by student's committee members and the graduate program director.
- Attainment of employment in positions requiring the expertise obtained with the degree.

Role of the program in helping the students to achieve Goal 1:

- Graduate director ensures that all students locate a faculty dissertation advisor within the first semester of enrollment.
- A graduate handbook, available on the department website, provides a comprehensive guide for students navigating the program; the handbook is reviewed by the faculty yearly to ensure it is up to date.
- Course learning goals are explicitly stated on all course syllabi and on course webpages; all graduate courses are listed on the department website.
- Primary advisor guides students to select appropriate classes within the many areas of environmental science that ensure they have the required skill sets and knowledge to succeed as a researcher.
- For those students pursuing the Environmental Science MS degree, ensuring that the five required courses are taken in a timely fashion.
- Departmental/program newsletter highlighting publications, presentations, grants, awards and achievements of both faculty and students in the DEES program; the newsletter also serves to illustrate the importance of communicating research and scholarship to the scientific community and the general public.
- Dedicated student webpages highlight publications, presentations, grants, awards and achievements of the students in the DEES program.
- Faculty reviews the graduate curriculum yearly to ensure that course offerings are sufficient and current in content.

Learning Goal 2 for Students: Engage in and conduct original, publishable research (for those students pursuing the thesis option)

Assessment of student achievement of Goal 2:

- Thesis proposal completed and defended by the end of the second semester; thesis must be prepared as a publication and submitted to a peer-reviewed scientific journal within the environmental sciences.
- Dissertation prepared and defended successfully.

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- Attendance and presentations (posters or talks) at local and national venues during the graduate study.
- Publication of scholarly articles in peer-reviewed journals on research in the dissertation project; the thesis must include at least three peer-reviewed publications (one published, one accepted and one submitted to review is the minimum requirement before a student may defend).
- Attainment of internal and external grants/fellowships for research.
- Attainment of awards for research achievements.

Role of graduate program in helping students achieve Goal 2:

- Annual 1.5 day graduate student retreat held off-campus at the end of the each academic year to foster interdisciplinary interaction among graduate students in DEES and provides an informal setting in which to discuss the challenges and opportunities of being a graduate research student. All information presented at the website is provided as a reference for graduate students on the department website.
- Graduate director (and advisor) introduces students to research possibilities in the first semester.
- Graduate director ensures that all students have formed an advisory committee consisting of the primary advisor and two committee members by the end of the first semester of study; one committee member from an external institution is encouraged.
- Graduate director advises students to meet with their advisor and committee frequently to act as mentors throughout the student's graduate career.
- Students are required to complete the Annual Progress Review Form (PRF) at the end of each academic year. Copies are given to and reviewed by the primary advisor, their committee members and the graduate director who are responsible for ensuring that students are reaching all major degree milestones and are on track to complete their degree in a timely manner. In addition to helping the department track student progress, the PRF serves to keep the students aware of and focused on upcoming milestones.
- Graduate director and department website highlight opportunities to write and submit grants to obtain external funding.
- DEES Graduate Program Seminar Series provides the opportunity for students to interact with local and visiting scientists, and showcases the most current research in environmental sciences on a weekly basis.
- Provide public opportunities for the students to present their research and gather feedback from peers and colleagues.
- Provide courses that require a research and writing component with critical feedback.
- Graduate director and primary advisor track student publications and presentations, and nominate eligible student candidates for awards.

Learning Goal 3 for Students: Professional career preparation

Assessment of graduate student achievement of Goal 3:

- Track number of publications, presentations, and outreach activities.
- Placement of students upon completion of degree.
- Feedback from employers of graduate students.

Role of graduate program in helping students to achieve Goal 3:

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- Provide students with an academic atmosphere that fosters professionalism by treating students as junior colleagues and expecting them to act in that manner.
- Provide networking opportunities via access to seminar speakers and visiting scholars through one-on-one meetings, funding to local and national meetings and professional organizations.
- Professional development opportunities (both academic and non-academic) are posted on the department bulletin board and opportunities are emailed to the department mailing list as they become available through the university.
- Summer internship opportunities (e.g. at government labs) and summer professional development programs are posted on the department bulletin board and opportunities are emailed to student via the department mailing list as they become available.
- Industry recruiters (e.g. from exploration companies) are invited to the department to provide opportunities for students to network with representatives from the professional sector.