

Ph.D. in Environmental Science

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Independent Learning

The grounding in scientific research methodology provided by the dissertation requirement is a central focus of the PhD program. One of the primary means of education and training in the PhD program is achieved through successful completion of an original research project in close mentorship by their research adviser and the presentation and defense of the PhD dissertation. This intense research experience provides the education and training necessary for the student to substantiate his/her expertise and develop the skills necessary to become an independent professional. By the end of the second semester, students will choose a dissertation adviser. Students will conduct research either on site at NJIT or at the professional laboratories/organizations where they work. In either case, a member of the NJIT Department of Chemistry and Environmental Science faculty will serve as research adviser and approve the research topic. This research culminates in the writing and presentation of the dissertation. The student will present his/her dissertation for examination by a committee consisting of a minimum of five members including the research adviser. One of the committee members will be from outside the department. A majority of the program committee members will hold tenure-earning faculty appointments in the Department of Chemistry and Environmental Science. The committee has to be approved by the director of the PhD Environmental Science graduate program, the department chair and the Office of Graduate Studies. With the exception of the outside member the other committee members need to have graduate faculty status. The dissertation must be judged worthy of publication by the dissertation committee and may not be submitted for examination until so deemed. For students performing their dissertation research off campus, the dissertation adviser will visit the student's laboratory/organization, where their research is to be performed, before the research begins and on a regular basis until the work is complete.

Total Minimum Hours Required for PhD for students entering with Bachelor's Degree (without MS degree) - 36 Credit Hours of 600/700-level Courses

Total Minimum Hours Required for PhD for students entering with MS degree - 12 Credit Hours of 700-level Courses

I. For Students Entering Without a MS Degree

Required Courses

Students must take the following five core courses and maintain a 3.0 GPA or higher: 15

EVSC 610	Environmental Chemical Science
EVSC 612	Environmental Analysis
EVSC 616	Toxicology
EVSC 627	Environmental Microbiology
EM 631	Legal Aspects in Environmental Engineering

Elective Courses 21

Students are required to take a minimum of seven 600- or 700-level courses (21 credit hours) with at least four (12 credit hours) of these at the 700-level. Courses are to be chosen from the departmental offerings or from outside of the department as deemed necessary. Up to six credit hours of Independent Study courses may be earned in fulfillment of the elective courses requirements.

EVSC 622	Bioremediation
EVSC 613	Environmental Problem Solving
EVSC 614	Quantitative Environmental Risk Assessment
EVSC 615	Global Environmental Problems
EVSC 702	Special Topics in Environmental Science II
EVSC 711	Advanced Environmental Analysis
EVSC 712	Hazardous Substance Management
EVSC 715	Energy and Sustainability
EVSC 725	Independent Study I
EVSC 726	Independent Study II
ENE 630	Physical Processes of Env Syst
ENE 660	Introduction to Solid and Hazardous Waste Problems
ENE 661	Environmental Microbiology
ENE 662	Site Remediation
ENE 663	Water Chemistry
ENE 664	Physical and Chemical Treatment
ENE 665	Biological Treatment
ENE 672	Stormwater Management
ENE 673	Sustainability and Life Cycle Analysis

IE 615	Industrial Hygiene and Occupational Health
EPS 612	Introduction to Environmental Policy Studies
EPS 614	Environmental Economics and Management
EPS 622	Sustainable Politics and Policy
EPS 638	Physical Geography
CHEM 714	Pharmaceutical Analysis
CHEM 748	Nanomaterials
CHEM 764	Advanced Analytical Chemistry
CHE 681	Polymerization-Principles and Practice
CHE 724	Sustainable Energy
MTSE 719	Physical Principles of Characterization of Solids

Total Credits**36****Dissertation Research Credits**

EVSC 792 Pre-Doctoral Research (after completing qualifying exam requirements)

EVSC 790 Doctoral Dissertation (after completing research proposal requirements)

Qualifying Examination

By the end of the second year, students must pass the PhD qualifying oral examination. A student is given two chances to clear the exam. The qualifying examination consists of writing and orally defending an original research proposal to the student's dissertation committee in which the committee conducts an oral exam of the candidate (majority vote of the committee required). The original research proposal will focus on a topic not directly related to the student's dissertation research and must be approved by the dissertation committee prior to development of the proposal. Failure to pass the PhD qualifying exam will result in dismissal from the program.

Dissertation Research Proposal

By the end of the first year of passing the qualifying exam (excluding summers), students must successfully present a proposal of their dissertation research to their dissertation committee and gain approval by a majority vote of the committee.

Dissertation Defense

The final requirement for the PhD degree is completion of a satisfactory written dissertation of the student's research, along with successful presentation and defense of the dissertation to the student's dissertation committee (majority vote of the committee).

II. For Students Entering With a MS Degree

Students with a recognized MS degree in environmental, chemical and biological sciences or closely related field such as engineering may, with approval of the PhD Graduate Committee be admitted to pursue the PhD degree in Environmental Science and be required to earn a minimum of 12 credit hours of coursework at the 700-level. Students entering the program without a MS in Environmental Science are required to take the core courses outlined in I along with the 700 level credits. Students with a MS in Environmental Science will be waived core requirements if they have taken similar courses before, and will complete only those among the core that they have not completed before.

Elective Courses**12**

Students are required to take a minimum of four 700-level courses (12 credit hours). Courses are to be chosen from the departmental offerings while up to three credit hours may be selected from outside of the department.

EVSC 702	Special Topics in Environmental Science II
EVSC 711	Advanced Environmental Analysis
EVSC 712	Hazardous Substance Management
EVSC 715	Energy and Sustainability
EVSC 725	Independent Study I
EVSC 726	Independent Study II
CHEM 714	Pharmaceutical Analysis
CHEM 748	Nanomaterials
CHEM 764	Advanced Analytical Chemistry
CHEM 777	Principles Pharm Chemistry
CHE 724	Sustainable Energy
MTSE 719	Physical Principles of Characterization of Solids

Total Credits**12**

Dissertation Research Credits

EVSC 792 Pre-Doctoral Research (after completing qualifying exam requirements)

EVSC 790 Doctoral Dissertation (after completing research proposal requirements)

Qualifying Examination

By the end of the second year, students must pass the PhD qualifying oral examination. A student is given two chances to clear the exam. The qualifying examination consists of writing and orally defending an original research proposal to the student's dissertation committee in which the committee conducts an oral exam of the candidate (majority vote of the committee). The original research proposal will focus on a topic not directly related to the student's dissertation research and must be approved by the adviser and advisory committee prior to development of the proposal. Failure to pass the PhD proficiency exam will result in dismissal from the program.

Dissertation Research Proposal

Within a year of passing the qualifying exam, students must successfully present a proposal of their dissertation research to their dissertation committee and gain approval by a majority vote of the committee.

Dissertation Defense

The final requirement for the PhD degree is completion of a satisfactory written dissertation of the student's research, along with successful presentation and defense of the dissertation to the student's dissertation committee (majority vote of the committee).

Grades

All students must maintain a grade point average of at least 3.0.