DOCTOR OF PHILOSOPHY (PhD) DEGREE IN THE FIELD OF ENVIRONMENTAL ENGINEERING

Program Learning Outcomes for the PhD Degree in the field of Environmental Engineering

Upon completing the PhD degree in the field of Environmental Engineering, students will be able to:

1. Demonstrate a solid foundation in civil and environmental engineering at the graduate level.
2. Acquire advanced knowledge of the principles of civil and environmental engineering and apply them to advanced technical problems.
3. Conduct an independent research program.
4. Demonstrate professional written and oral communication skills.

Requirements for the PhD Degree in the field of Environmental Engineering

For general university requirements, please see Doctoral Degrees (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-doctoral-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see All Graduate Students (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/). Students pursuing the PhD degree in the field of Environmental Engineering must:

- Complete 90 credit hours at the 500-level and above of approved courses past the BS degree (60 credit hours past the MS degree) with high standing (see guidelines on the department website (https://cee.rice.edu/)).
- Complete at least 6 core courses required by the department with a minimum GPA of 3.00 or higher and a minimum grade of B- (2.67 grade points) in each course.
- Spend at least four semesters in full time study at Rice and successfully accomplish the following:
  - Pass a preliminary examination in environmental engineering (see guidelines on the PhD Program > Preliminary Exam tab of the department website (https://cee.rice.edu/academics/graduate-programs/phd-program/phd-preliminary-exam/)).
  - Pass a qualifying examination on coursework, proposed research, and related topics.
  - Complete a thesis indicating an ability to conduct original and scholarly research.
  - Pass a formal public oral examination on the thesis and related topics.

Course requirements are stipulated to prepare and train students for rigorous and high quality education, research, and practice. These courses, usually completed within the first two years of graduate school, are designed to train and test the student’s aptitude for higher level thinking, problem solving, and independent research. Core courses also contribute breadth beyond minimum competency as civil and environmental engineers. The students are expected to strive for breadth and depth in core course selection, by working with their advisor and preliminary examination committee, and ensure that minimum core competency expectations are met.

PhD students in the EES field will be scheduled to take their preliminary examination no later than after two semesters of coursework at Rice. A student who enters in the spring semester needs to take the preliminary exam in the following spring semester along with other students. A student who passes the written and oral parts of the preliminary exam becomes eligible for taking the qualifying exam.

The qualifying examination is administered by the doctoral committee after students develop a research proposal to demonstrate their preparation for the proposed research and identify any areas requiring additional coursework or study. As part of the advanced degree training, we also may require students to assist the faculty in undergraduate courses and laboratory instructions.

The requirements listed in the General Announcements (GA) satisfy the minimum requirements for this degree program. In certain instances, courses (or requirements) not officially listed here may be substituted upon approval of the program’s academic advisor, or where applicable, the department or program’s Director of Graduate Studies. Course substitutions or any exceptions to the stated official curricular requirements must be approved by the Office of Graduate and Postdoctoral Studies (https://graduate.rice.edu/). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the PhD Degree in the field of Environmental Engineering</td>
<td>90</td>
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Degree Requirements

Core Requirements ¹

Select 6 courses from the following: 18

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CEVE 501</td>
<td>CHEMISTRY FOR ENVIRONMENTAL ENGINEERING AND SCIENCE</td>
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<tr>
<td>CEVE 504</td>
<td>ATMOSPHERIC PARTICULATE MATTER</td>
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<tr>
<td>CEVE 509</td>
<td>HYDROLOGY AND WATER RESOURCES ENGINEERING</td>
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<tr>
<td>CEVE 511</td>
<td>ATMOSPHERIC CHEMISTRY AND CLIMATE</td>
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<td>CEVE 518</td>
<td>ENVIRONMENTAL HYDROGEOLOGY</td>
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<tr>
<td>CEVE 534</td>
<td>FATE AND TRANSPORT OF CONTAMINANTS IN THE ENVIRONMENT</td>
<td></td>
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<tr>
<td>CEVE 535</td>
<td>PHYSICAL CHEMICAL PROCESSES FOR WATER QUALITY CONTROL</td>
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<tr>
<td>CEVE 536</td>
<td>ENVIRONMENTAL BIOTECHNOLOGY AND BIOREMEDIATION</td>
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<td>CEVE 544</td>
<td>ENVIRONMENTAL MICROBIOLOGY AND MICROBIAL ECOLOGY</td>
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<tr>
<td>CEVE 550</td>
<td>ENVIRONMENTAL ORGANIC CHEMISTRY</td>
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¹ Additional coursework or study may be required.
Policies for the PhD Degree in the field of Environmental Engineering

Department of Civil and Environmental Engineering Graduate Program Handbook

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the Department of Civil and Environmental Engineering publishes a graduate program handbook, which can be found here: https://cee.rice.edu/2021_22/Civil_Environmental_Engineering_Graduate_Handbook.pdf

Admission

Applicants pursuing graduate education in environmental engineering or hydrology should have a BS or BA in related areas of science and engineering and preparation in mathematics, science, and engineering or related courses. A BS degree in Engineering or a degree in natural science is preferred.

Successful applicants typically have at least a 3.00 (B) grade point average in undergraduate work and high Graduate Record Examination (GRE) scores. For general university requirements, see Graduate Degrees (https://ga.rice.edu/graduate-students/academic-opportunities/degrees/) and Admission to Graduate Study (https://ga.rice.edu/graduate-students/academic-policies-procedures/admission/).

Transfer Credit

For Rice University’s policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer). Some departments and programs have additional restrictions on transfer credit. Students are encouraged to meet with their academic program’s advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines

Students pursuing the PhD degree in the field of Environmental Engineering should be aware of the following departmental transfer credit guidelines:

- Requests for transfer credit will be considered by the program director on an individual case-by-case basis.

Additional Information

For additional information, please see the Civil and Environmental Engineering website: https://cee.rice.edu/