

# BACHELOR OF ARTS (BA) DEGREE WITH A MAJOR IN CIVIL AND ENVIRONMENTAL ENGINEERING AND A MAJOR CONCENTRATION IN ENVIRONMENTAL ENGINEERING

## Program Learning Outcomes for the BA Degree with a Major in Civil and Environmental Engineering and a Major Concentration in Environmental Engineering

Upon completing the BA with a major in Civil and Environmental Engineering and a major concentration in Environmental Engineering, students will be able to demonstrate:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
6. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Requirements for the Bachelor of Arts (BA) Degree with a Major in Civil and Environmental Engineering

For general university requirements, see [Graduation Requirements \(https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/\)](https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BA degree with a major in Civil and Environmental Engineering must complete:

- A minimum of 58 credit hours to satisfy major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 9-10 courses (25-28 credit hours), depending on declared major concentration, taken at the 300-level or above.
- 9 courses (21 credit hours) of General Math and Science courses.
- 6 courses (16 credit hours) as Major Concentration Core courses.

- 7 courses (21 credit hours) in a focused specialty area of study.
- The requirements of a major concentration. When students **declare the major** (<https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/#text>) in Civil and Environmental Engineering, students must additionally identify and declare one of two major concentrations, either in:
  - **Civil Engineering** ([https://ga.rice.edu/programs-study/departments-programs/engineering/civil-environmental-engineering/civil-environmental-engineering-ba-civil-concentration/#Civil\\_Engineering](https://ga.rice.edu/programs-study/departments-programs/engineering/civil-environmental-engineering/civil-environmental-engineering-ba-civil-concentration/#Civil_Engineering)), **or**
  - **Environmental Engineering** (p. 2).

Because of the common core requirements, it is possible for students to change their major concentration at any time, even after initially declaring the major. To do so, please contact the [Office of the Registrar \(registrar@rice.edu\)](mailto:registrar@rice.edu).

Each major concentration is to be tailored to the specific needs of the student by discussions with, and approval by, the Civil and Environmental Engineering departmental major concentration advisor. Although not required, students are encouraged to double major when pursuing the BA degree.

The coherent and complete core curriculum is designed to give Rice undergraduate students a consistent technological literacy through the lens of Civil and Environmental Engineering and to prepare students for graduate school in engineering, various sciences (depending upon focus), economics, business MBA, political science, law, or medicine. Select students will be invited to finish an **accelerated MS/PhD degree** in the CEVE Department (see your advisor or department chair for details). Those students who want to obtain an engineering degree from a program accredited by the Engineering Accreditation Commission (EAC) of ABET must follow one of the Bachelor of Science programs the EAC has accredited at Rice, like the Bachelor of Science in Civil Engineering (BSCE). Students pursuing professional engineering licensure should also consider our BS in Civil and Environmental Engineering (BSCE).

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval of the major's academic advisor, or where applicable, the department's Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major's [Official Certifier \(https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/\)](https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

## Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Major in Civil and Environmental Engineering		58
Total Credit Hours Required for the BA Degree with a Major in Civil and Environmental Engineering		120

## Degree Requirements

Code	Title	Credit Hours
<b>Core Requirements</b>		
General Math and Science Courses		
CHEM 121	GENERAL CHEMISTRY I	3
	or CHEM 111 AP/OTH CREDIT IN GENERAL CHEMISTRY I	

CHEM 123 or CHEM 113	GENERAL CHEMISTRY LABORATORY I AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I	1
CMOR 220 or CMOR 302	INTRODUCTION TO ENGINEERING COMPUTATION MATRIX ANALYSIS	3
MATH 101 or MATH 105	SINGLE VARIABLE CALCULUS I AP/OTH CREDIT IN CALCULUS I	3
MATH 102 or MATH 106	SINGLE VARIABLE CALCULUS II AP/OTH CREDIT IN CALCULUS II	3
PHYS 101 & PHYS 103	MECHANICS (WITH LAB) and MECHANICS DISCUSSION <sup>1</sup>	4
PHYS 102 & PHYS 104	ELECTRICITY & MAGNETISM (WITH LAB) and ELECTRICITY AND MAGNETISM DISCUSSION <sup>2</sup>	4
<b>Major Concentration</b>		
<i>Select 1 of the following Major Concentrations (see below for Major Concentration requirements):</i>		16
Civil Engineering		
Environmental Engineering		
<b>Specialty Focus Area</b>		
<i>Select 7 courses from approved electives selected with the Civil and Environmental Engineering advisor (see below for more information, including course requirements).</i>		21
<b>Total Credit Hours Required for the Major in Civil and Environmental Engineering</b>		<b>58</b>
Additional Credit Hours to Complete Degree Requirements *		31
University Graduation Requirements ( <a href="https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/">https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/</a> ) *		31
<b>Total Credit Hours</b>		<b>120</b>

### Footnotes and Additional Information

\* **Note:** University Graduation Requirements include 31 credit hours, comprised of Distribution Requirements (Groups I, II, and III), FWIS, and LPAP coursework. In some instances, courses satisfying FWIS or distribution requirements may additionally meet other requirements, such as the Analyzing Diversity (AD) requirement, or some of the student's declared major, minor, or certificate requirements. Additional Credit Hours to Complete Degree Requirements include general electives, coursework completed as upper-level, residency (hours taken at Rice), and/or any other additional academic program requirements.

<sup>1</sup> The Civil and Environmental Engineering department has determined that credit awarded for PHYS 141 *CONCEPTS IN PHYSICS I* is not eligible for meeting the requirements of the Civil and Environmental Engineering major.

<sup>2</sup> The Civil and Environmental Engineering department has determined that credit awarded for PHYS 142 *CONCEPTS IN PHYSICS II* is not eligible for meeting the requirements of the Civil and Environmental Engineering major.

### Major Concentration: Environmental Engineering

Students must complete the following 6 courses (16 credit hours) to satisfy the requirements for the major concentration in Environmental Engineering.

Code	Title	Credit Hours
<b>Required Courses for the Major Concentration in Environmental Engineering</b>		
CEVE 307 / EEPS 307 / ENST 307	ENERGY AND THE ENVIRONMENT	3
CEVE 310	PRINCIPLES OF ENVIRONMENTAL ENGINEERING	3
CEVE 315	URBAN WATER SYSTEMS: SOURCES, TREATMENT, DISTRIBUTION, RESOURCE RECOVERY AND REUSE	3
CEVE 316	URBAN WATER SYSTEMS LAB: WATER QUALITY PARAMETERS AND TREATMENT TECHNIQUES	1
CEVE 401	CHEMISTRY FOR ENVIRONMENTAL ENGINEERING AND SCIENCE	3
CEVE 412	HYDROLOGY AND WATER RESOURCES ENGINEERING	3
<b>Total Credit Hours</b>		<b>16</b>

### Specialty Focus Area

To satisfy the remaining Specialty Focus Area of the BA degree with a major in Civil and Environmental Engineering, students must complete a total of 7 courses (21 credit hours) from approved electives selected with the Civil and Environmental Engineering advisor. Course selection must meet the following requirements:

- A minimum of 4 courses (12 credit hours) must be within one Specialty Focus Area (See examples below).
- A minimum of 4 courses (12 credit hours) from the 300-level or above; 2 of these 4 courses (6 credit hours) must also be selected from departmental (CEVE) course offerings.

Example Specialty Focus areas are suggested below; however students are encouraged to prepare their own specialty related to their career objectives in consultation with, and approval by, their Civil and Environmental Engineering advisor.

1. Biology
2. Chemical Engineering
3. Chemistry
4. Civil Engineering
5. Economics
6. Environmental Science and Engineering
7. Management

## Policies for the BA Degree with a Major in Civil and Environmental Engineering and a Major Concentration in Environmental Engineering

### Program Restrictions and Exclusions

Students pursuing the BA Degree with a Major in Civil and Environmental Engineering and a Major Concentration in Environmental Engineering should be aware of the following program restrictions:

- As noted in [Majors, Minors, and Certificates \(https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-\)](https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-)

[certificates/](#)), under *Declaring Majors, Minors and Certificates*, students may not obtain both a BA and a BS in the same major. Students pursuing the BA Degree with a Major in Civil and Environmental Engineering and a Major Concentration in Environmental Engineering may not additionally pursue the Bachelor of Science in Civil Engineering (BSCE) Degree.

- Students pursuing the major in Civil and Environmental Engineering may pursue only one major concentration within the major.

## Transfer Credit

For Rice University's policy regarding transfer credit, see [Transfer Credit \(https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/\)](https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/). Some departments and programs have additional restrictions on transfer credit. The Office of Academic Advising maintains the university's official list of [transfer credit advisors \(https://oaa.rice.edu/advising-network/transfer-credit-advisors/\)](https://oaa.rice.edu/advising-network/transfer-credit-advisors/) on their website: <https://oaa.rice.edu>. Students are encouraged to meet with their academic program's transfer credit advisor when considering transfer credit possibilities.

## Departmental Transfer Credit Guidelines

Students pursuing the major in Civil and Environmental Engineering should be aware of the following departmental transfer credit guidelines:

- Requests for transfer credit will be considered by the program director (and/or the program's official transfer credit advisor) on an individual case-by-case basis.

## Additional Information

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

# Opportunities for the BA Degree with a Major in Civil and Environmental Engineering and a Major Concentration in Environmental Engineering

## Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see [Latin Honors \(https://ga.rice.edu/undergraduate-students/honors-distinctions/university/\)](https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (*summa cum laude*, *magna cum laude*, and *cum laude*) and [Distinction in Research and Creative Work \(https://ga.rice.edu/undergraduate-students/honors-distinctions/university/\)](https://ga.rice.edu/undergraduate-students/honors-distinctions/university/). Some departments have department-specific Honors awards or designations.

## Departmental Honor, Award, and Scholarship Opportunities

- **Distinction in Research and Creative Work:** The Department of Civil and Environmental Engineering will recognize graduating seniors for outstanding creative contributions with the award of [Distinction in Research and Creative Work \(https://ga.rice.edu/undergraduate-students/honors-distinctions/university/\)](https://ga.rice.edu/undergraduate-students/honors-distinctions/university/). The Department recognizes this award as being a significant honor. As such, it will be awarded to no more than 20% of a graduating class (rounded up to next whole number). This award shall be given for significant contributions in research, design, and creative

projects beyond class assignments (except CEVE 499). Generally, it is expected that the student recipients will have performed research/design for a minimum of two academic segments (one segment = one academic year or one summer) during their undergraduate career (either for credit or pay). It may be given for one outstanding piece of work for consistent meaningful contributions made over the course of an undergraduate career. All majors (BA and BS) are eligible and will be considered for this distinction in the spring prior to their graduation.

- **Rice Global Forum:** Rice Global Forum (RGF) is an engineering and construction industry funded center which is in its second decade of operation. It was founded by Ahmad Durrani, past chair of Civil and Environmental Engineering at Rice. RGF funds and facilitates interaction with the engineering and construction industry, particularly oil and gas related work. RGF funds \$25,000 worth of scholarships every year. In addition, RGF also consistently sponsors and supports Engineers Without Borders (EWB) and has donated to other student clubs as well in addition to holding an engineering design competition every year in February during National Engineers Week.

## Fifth-Year Master's Degree Option for Rice Undergraduate Students

In certain situations and with some terminal master's degree programs, Rice students have an option to pursue a master's degree by adding an additional fifth year to their four years of undergraduate studies.

Advanced Rice undergraduate students in good academic standing typically apply to the master's degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master's degree program. A plan of study will need to be approved by the student's undergraduate major advisor and the master's degree program director.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for a bachelor's degree and the master's degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).
- more information on this *Undergraduate - Graduate Concurrent Enrollment* opportunity, including specific information on the registration process can be found [here \(https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/\)](https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/).

Rice undergraduate students completing studies in science and engineering may have the option to pursue the Master of Civil and Environmental Engineering (MCEE) degree. For additional information, students should contact their undergraduate major advisor and the (MCEE) chair of the department graduate studies committee.

## Student Organizations and Clubs

- **American Society of Civil Engineers Student (ASCE):** <https://www.asce.org/communities/student-members> (<https://www.asce.org/communities/student-members/>) ASCE seeks to promote civil and environmental engineering, expose students to real world engineering, and connect students to alumni

and professionals. Throughout the year we invite speakers from the industry, visit plants and sites, and organize social events. The objectives of this Chapter are to encourage the development of a professional consciousness, to afford an opportunity for civil engineering students to become acquainted and to practice working together effectively, to promote a spirit of congeniality among them, and to provide friendly contact with the engineering profession. We also support the Concrete Canoe competition (see below) and the Seismic Design Competition of the Earthquake Engineering Research Institute (EERI).

- **Chi Epsilon:** <https://www.chi-epsilon.org/>  
Chi Epsilon is dedicated to maintaining and promoting the status of civil engineering as an ideal profession. Chi Epsilon was organized to recognize the characteristics of the individual civil engineering deemed to be fundamental to the successful pursuit of an engineering career, and to aid in the development of those characteristics in the civil engineering student.
- **Engineers Without Borders (EWB):** <https://ewb.rice.edu/>  
EWB partners with developing communities worldwide to design engineering solutions that will improve their standards of living. It is an important component of the Civil and Environmental Engineering program. BA students with their flexible curriculum are encouraged to participate. This exciting endeavor allows undergraduates to have an experience in a developing country, where they are able to design and build a project to help society. Students have been attracted to the EWB program in large numbers and our local chapter is one of the most successful in the United States. Some CEVE courses are EWB-related, providing the opportunity to also obtain credit hours.
- **Concrete Canoe:** <https://concretecanoe.rice.edu/>  
Rice Concrete Canoe is a student-run club that creates a functional concrete canoe to race and present at the yearly ASCE sponsored competition. Through the year, members gain engineering experience through the research, planning and constructing of a concrete canoe. By offerings members exposure to the engineering design process, small-group work, software such as Matlab and Adobe Illustrator (and possibly more starting this year), and laser cutters, Concrete Canoe offers a unique experience to students regardless of whether or not they want to become engineers.
- **Society of Women Engineers:** <https://swe.rice.edu/>  
The Society of Women Engineers aims to empower women to pursue and achieve their full potential in science and engineering related fields. We provide opportunities in professional development, academic and post-graduate planning, community outreach, and social events.

## Additional Information

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