



Graduate Study *at*



Environmental Engineering at Rice University was founded in 1967 to study problems related to water supply and water pollution. Today it is widely recognized as one of the nation's leaders in the education of environmental engineers and scientists through a highly interdisciplinary research experience with strong underpinnings in various scientific and engineering disciplines.

The mission of the department is to educate tomorrow's leaders and enable them to define and solve complex problems associated with the management, preservation and remediation of the environment in which we live. Fundamental to solving environmental problems is a sound knowledge of the underlying physical, chemical and biological processes that govern interactions in environmental systems. To this end, the program brings together faculty with complementary backgrounds to provide a multidisciplinary forum for research-based education. For further information, please visit the Website for the Department of Civil and Environmental Engineering at www.ceve.rice.edu.

RESEARCH

Research and education in the department is supported by numerous federal, state, private and corporate sources. The overall research theme of the program is the coupling of transport processes with pollutant reactivity. Current thrusts focus on the following areas:

- Environmental applications and implications of nanotechnology
- Environmental biotechnology and bioremediation
- Urban air quality and atmospheric chemistry
- Water resources, flood prediction and disaster mitigation
- Advanced technologies for water purification and waste water reuse
- Aquatic and colloid chemistry
- Transport and fate of contaminants in the environment

The department also hosts the headquarters of two major research centers: (1) The NSF-sponsored Engineering Research Center for Nanotechnology Enabled Water Treatment (NEWTEC), which is the first national center to develop next-generation water treatment systems enabled by nanotechnology to protect human lives and support sustainable economic development; and (2) the Severe Storm Prediction, Education and Evacuation from Disasters (SSPEED) Center, which addresses the risks associated with severe storms and hurricanes in the Gulf Coast Region and informs the public about structural and non-structural mitigation strategies at multiple scales.

GRADUATE PROGRAMS

Graduate programs include both research degrees and professional degrees. Research programs in environmental science and engineering lead to the degrees of Master of Science and Doctor of Philosophy. The non-thesis program leads to the degree of Master of Civil and Environmental Engineering, which is a professional degree obtainable in one year.

In the selection of prospective graduate students at Rice, all available material is carefully evaluated, particularly: 1) scores on the Graduate Record Examination; 2) the scholastic record as reflected by courses chosen and the quality of performance; 3) the evaluations of teachers and advisers; and 4) the student's own statement of goals, aspirations and special interests.

GRADUATE STUDY
IN ENVIRONMENTAL
ENGINEERING
Rice University

Department of Civil
& Environmental
Engineering

WWW.CEE.RICE.EDU

For admission
in 2017

DOCTOR OF PHILOSOPHY

Students pursuing the doctoral degree must: 1) complete 90 credit hours of approved courses past BS (60 credit hours past MS degree) with high standing, 2) pass a comprehensive preliminary written and oral examination to evaluate preparation for doctoral studies in the field of environmental engineering, 3) pass a qualifying examination on course work, proposed research, and related topics 4) complete a dissertation indicating an ability to conduct original and scholarly research and 5) pass a formal public oral examination on the thesis.

Doctoral candidates take the written and oral preliminary exams, administered by department faculty after two semesters of course work. Students who pass this exam then form a doctoral committee according to department requirements. After the doctoral candidate has formed a committee and developed a proposal for doctoral research, the candidate must pass a qualifying examination administered by the committee. The purpose of the qualifying exam is to evaluate the candidate's preparation for the proposed research and to identify any areas requiring additional course work or study. For more information on core course requirements and the preliminary exam, please visit our website, www.ceve.rice.edu.

MASTER OF SCIENCE

Students pursuing the M.S. degree program must complete a minimum of 30 credit hours to satisfy degree requirements, complete a minimum of 24 credit hours of approved courses and 6 credit hours of thesis research. Students studying environmental engineering must include one course each in environmental chemistry, water treatment, hydrology, and air quality, select a thesis committee according to department requirements and conduct original research in consultation with the committee, present and defend in oral examination an approved research thesis. Usually, two academic years and the intervening summer are sufficient to successfully complete this degree program.



The MS advisory committee is composed of at least three tenure-track members of the Rice faculty. Two members, including the committee chair, must be members of the CEE department. Individuals from other institutions (academic, business and/or government) may also serve on the thesis advisory committee, but they may not substitute for any of the required Rice faculty members. Students will be permitted to take an oral examination on their thesis only after their thesis advisory committee has determined that the thesis is in an acceptable written format for a public defense.

NONTHESIS PROGRAMS

The Master of Civil and Environmental Engineering (MCEE) degree is a professional non-thesis degree requiring 30 credit hours of approved courses at the 500-level or above, including a final project of 2 credit hours. Typically this requires two semesters of study. A minimum of 24 credit hours must be at Rice and a minimum residency of one fall or spring semester in full-time or part-time study. Applicants must have obtained a bachelor of arts or bachelor of science in the natural or physical sciences or from a field of engineering. Students pursuing the MCEE as a terminal degree are not eligible for financial aid from Rice University.

FACULTY/CURRENT RESEARCH

Pedro J. J. Alvarez – George R. Brown Professor, Civil and Environmental Engineering and Director of the NEWT ERC. B.Eng., Civil Engineering, McGill University; M.S.E., and Ph.D., Environmental Engineering, University of Michigan. Research interests: environmental biotechnology, bioremediation, water footprint of biofuels, environmental nanotechnology, water treatment and reuse for the oil and gas industry.

Philip B. Bedient – Herman Brown Professor of Engineering, Civil and Environmental Engineering and Director of SPEED Center. B.S., Physics, University of Florida; M.S., Environmental Engineering, University of Florida; Ph.D., Environmental Engineering Sciences, University of Florida. Research interests: surface and groundwater hydrology, contaminant transport in groundwater, aquifer remediation strategies and modeling, geographical information and decision support systems, flood control and water resource strategies and flood alert systems.

Daniel S. Cohan – Associate Professor, Civil and Environmental Engineering. B.A., Applied Mathematics, Harvard University; Ph.D., Atmospheric Science, Georgia Institute of Technology. Research interests: photochemical modeling, satellite data, air quality management, uncertainty analysis and the impacts of energy use on the environment.

Robert J. Griffin – Professor and Department Chair, Civil and Environmental Engineering. B.S., Chemical Engineering, Tufts University; M.S. Chemical Engineering, California Institute of Technology; Ph.D., Chemical Engineering with minor in Environmental Engineering Science, California Institute of Technology. Research interests: air quality modeling, atmospheric chemistry, aerosol thermodynamics and chemistry, urban air pollution.

Qilin Li – Associate Professor, Civil and Environmental Engineering. B.S., Environmental Engineering, Tsinghua University; M.S. and Ph.D., Environmental Engineering, University of Illinois at Urbana-Champaign; Research interests: advanced technologies for drinking water purification and wastewater reuse, desalination, colloidal processes and interfacial phenomena in the aqueous environment, applications and implications of nanotechnology.



Lauren Stadler - Assistant Professor, Civil and Environmental Engineering, B.S., Engineering, Swarthmore College, M.S.E. and Ph.D., Environmental Engineering, University of Michigan. Research interest: advancing water reuse and energy recovery from wastewater using a multi-disciplinary approach that combines microbial ecology, environmental chemistry, and sustainability assessment.

Mason B. Tomson – Professor, Civil and Environmental Engineering, B.S., Chemistry and Mathematics, Southwestern State University; Ph.D., Chemistry, Oklahoma State University. Research interests: application of basic chemical principles to environmental science and engineering issues, specifically fate and transport of chemicals and nanoparticles in nature and all aspects of water and treatment related to energy and the environment.

PROFESSORS OF THE PRACTICE

James B. Blackburn – Blackburn Carter P.C., Houston, TX

Ed Segner – Former President and Chief of Staff, EOG Resources, Inc., Houston, TX

LECTURERS

Philip deBlanc – Groundwater Services, Houston, TX

Moyeen Haque, Principal – Matrix Structural Engineers, Houston, TX

Nadathur Varadarajan, Engineer – J. Ray McDermott

Steve Wilkerson, Engineer – Haynes Whaley and Associates

PROFESSORS EMERITI

Dr. Calvin H. (Herb) Ward, Professor Emeritus – Rice University, Houston, TX

ADJUNCT PROFESSORS

Jean-Yves Bottero – Director, Le Centre Europeen de Recherche et d'Enseignement des Geosciences de l'Environnement (CEREGE)

Wei Chen – Professor, Nankai University, Tianjin, China

Zheng “Nick” Fang – Asst. Prof. University at Arlington

Richard Johnson – Director, Admin. Center for Sustainability and Energy Management, Professor in Practice Environmental Study, Sociology, Rice University

Kenneth Medlock – Baker Fellow in Energy and Resource Economics, Adjunct Assistant Professor of Economics, Rice University

Charles J. Newell – Vice President, GSI Environmental, Houston, TX

Carroll Oubre – Former Director, Environmental R&D, Shell Oil Company, Rice University, Houston, TX

Javier Rojo – Seneca C. and Mary B. Weeks endowed chair of statistics and Chair of the Dept. of Mathematics and Statistics at the University of Nevada, Reno

Baxter Vieux – Professor, Civil and Environmental Engineering, University of Oklahoma, Norman, OK, Vieux and Associates, Norman, OK

FACILITIES

The laboratories of the environmental engineering program at Rice University have several wet labs for environmental research and additional computational space. These labs are well equipped for research in the areas of environmental microbiology, molecular biology, organic pollutant analysis, colloid and nanoparticle characterization, and atmospheric and water chemistry. In addition, the modern facilities of the Rice Shared Equipment Authority are available for research. A list of equipment shared can be found at sea.rice.edu.

Rice University has a large nanotechnology community with well-equipped surface analysis equipment available on a shared basis. Major surface analysis instrumentation includes: FEI XL-30 Environmental Scanning Electron Microscope (ESEM), JEOL 2010 Transmission Electron Microscope (TEM), AFMs, Polarizing Optical Microscope, X-ray Diffractometer, Raman Microscope, FTIR Infrared Microscope, X-ray photoelectron spectroscopy and scanning tunneling microscopy.

Other common laboratory equipment available include GC, GC/MS, ICP, ICP/MS, several UV/Vis spectrophotometers, HPLCs, centrifuges, LC/MS, microscopes, an autoclave, a Beckman liquid scintillation counter, a TOC analyzer and photon correlation spectrometry. Additional instruments located in other departments of Rice University are available for use with a nominal usage fee. The X-ray adsorption fine structure (XAFS) is available to us via Dr. Barrera of the Dept. of Materials Science at Rice.

Civil and environmental engineering acquired a Geographical Information System (GIS) laboratory in 2001 consisting of 10 computers to conduct research in the GIS field and to educate students in the use of GIS. Eight student laboratory computers are installed with following software relating to GIS as well as hydraulic and hydrologic themes: ArcView 3.2a, ArcView 8.1, 3D Analyst, Spatial Analyst, GMS 4.0, Groundwater Vistas 3.0, HEC GEO-HMS, HEC GEO-RAS, HEC- HMS 2.2.2 and HEC-RAS3.1.1.

The Ken Kennedy Institute for Information Technology (K2I), together with the Office of the Vice Provost for Information Technology (IT), provides faculty, staff, and students access to a shared research cyberinfrastructure (computing, storage and visualization infrastructure), application and software support, data management services, and user training, all at minimal cost. Rice currently owns and operates several large-scale computational resources built around x86, Power7, Power8 and BlueGene technology capable of delivering about 90 million computing hours per year (see <http://rcsg.rice.edu>), and a display wall with more than 33 million pixels (see <http://viz.rice.edu>).

FINANCIAL ASSISTANCE

Tuition scholarships, fellowships or research assistantships are available for students admitted to the Ph.D. program and some M.S. students. (MCEE students are not eligible for these awards.) Fellowships and research assistantships provide tuition plus a stipend. All recipients of scholarships, fellowships and assistantships are expected to devote full time to their graduate studies. A modest amount of service to the department such as grading, teaching, research or laboratory assistance, is customarily required as a part of our advanced degree program.

The Alliances for Graduate Education and the Professoriate at Rice (AGEP) encourages diversity in our student population as well as a culture of excellence in inclusion by providing scholarships to qualified, underrepresented students who intend to pursue a Ph.D. in science, mathematics or engineering.

Financial support beyond the first year will depend on satisfactory performance in course work.

Stipend levels are reviewed annually and adjusted periodically to maintain competitiveness with comparable institutions.

ADMISSION

To encourage close contact between students and faculty and to maintain the highest-quality student body possible, the program is limited to approximately six to 10 entering thesis master's and Ph.D. candidates per year. Faculty encourages students pursuing the master's degree to continue to the Ph.D. Nonthesis master's degree candidates comprise approximately 10 percent of our student base.

Three basic criteria are used in the selection of prospective graduate students:

- (1) academic record (quality of previous education, including courses and grades)
- (2) academic potential evaluated by the faculty
- (3) GRE scores (and TOEFL scores for foreign applicants)

HOW TO APPLY

Applicants are encouraged to utilize the online application, which can be accessed at <http://cevegradapps.rice.edu>. For more information, visit our website at www.cee.rice.edu/graduate.

The completed application forms must include the following:

- transcripts of grades from all undergraduate and graduate schools attended
- at least three letters of recommendation from advisers
- GRE scores, including verbal, quantitative, and analytical (subject test not required)
- TOEFL scores if the applicant's native language is not English (A minimal TOEFL score of 90 on iBT, 600 on paper-based or 250 on computer-based is required for admission to Rice.)
- an application fee of \$85

The application deadline for fall admission is February 1.



ABOUT RICE AND HOUSTON

Rice is a leading American research university – small, private and highly selective – distinguished by a collaborative, interdisciplinary culture and a global perspective. Only a few miles from downtown Houston, it occupies an architecturally distinctive, 285-acre campus shaded by nearly 4,000 trees. State-of-the-art facilities and laboratories, internationally renowned centers and institutes and one of the country's largest endowments support an ideal learning and living environment.

The university attracts a diverse group of highly talented students and faculty with outstanding graduate and professional programs in the humanities, social sciences, natural sciences, engineering, architecture, music and business. With just 2,744 graduate students and 3,879 undergraduates, it offers an unusual opportunity to forge close relationships with eminent faculty scholars and researchers and the option to tailor graduate programs to specific interests.

Houston offers all the expected educational, cultural and commercial advantages of a large urban center, and more. It is home of the Texas Medical Center, the largest concentration of medical schools, hospitals and research facilities in the world, as well as several other universities. Rice has cooperative programs with the University of Houston, Baylor College of Medicine, the University of Texas Health Science Center and Texas Southern University. Houston is one of the few U.S. cities with resident companies in all four major performing arts – drama, ballet, opera and symphony. It also boasts a museum district featuring exhibits of national and international prominence.

As urban as it is, Houston also is a surprisingly green city. Houstonians enjoy the outdoors in more than 300 municipal parks and 120 open spaces, and many frequent the beach at Galveston Island, only a 45-minute drive away. Other short trips include Austin, the state's capital, and historic San Antonio, both of which are a little more than three hours away.

CAMPUS VISIT

We encourage you to visit Rice at any time for a firsthand look at the department and the beautiful, tree-lined campus near the heart of historic Houston. If you apply and are admitted, you will be invited to visit the campus later at departmental expense. During your time here, you will not only visit with faculty, but usually you'll be hosted by current graduate students from whom you can learn more about graduate life and lifestyles in Houston. In the meantime, feel free to contact the department with any questions you may have.

FOR ADDITIONAL INFORMATION:

Rice University homepage:

www.rice.edu

Rice University Office of Graduate and Postdoctoral Studies homepage:

graduate.rice.edu

Graduate Student Association homepage:

gsa.rice.edu

City of Houston homepage: www.houstontx.gov

Houston information from the *Houston Chronicle*:

www.chron.com

Houston information from the Greater Houston Partnership:

www.houston.org

Houston information from Citysearch:

houston.citysearch.com

