

## ENERGY AND WATER SUSTAINABILITY

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The Civil and Environmental Engineering Department at Rice offers undergraduate students the opportunity to select a minor in energy and water sustainability. Sustainable development is a societal goal that challenges existing ways of thinking and requires alternative solutions and approaches. Carbon management strategies will likely drive energy policies over the coming decades, directly impacting most aspects of energy delivery and usage in society. Similarly, the long-term viability of existing water use and settlement patterns must be reconsidered, given alterations in climate patterns and competing demands for this limited resource. Students choosing this minor will gain knowledge of both the science and policy issues associated with these two issues which form a cornerstone of modern society. Students completing this minor in sustainability will be better prepared for global society that is both attempting to understand and addressing the challenge of meeting the basic needs of an expanding population in light of a clearer realization of natural resource limitations.

This EWS minor is focused on sustainable development thinking which requires the integration of economic, ecological and social concerns. The introductory course is intended to provide basic information on the fusion of these three factors in the context of alternative energy sources and water-related issues. Additional courses will focus upon understanding the use of various tools of sustainability, including impact analysis and risk assessment, among others. Higher-level courses are designed to address practical problem-solving as well as understanding policy issues. The goal of this minor is to educate students to be able to think through energy and water issues and solutions with a view toward the long-term sustainability of human settlements and the Earth.

Core courses:

CEV/ENGI 202 Sustainable Design (3 credits; course to be developed; see Appendix A)  
CEVE 307 Energy and the Environment  
CEVE 322/ENGI 303 Engineering Economics or  
ECON 480 Environmental Economics (requires ECON 211 or 370 or permission)

Electives: three courses from the list below, with no more than two drawn from any one area.

*Energy elective courses (choose up to two):*

ECON 437 Energy Economics (pre-requisite: ECON 370)  
ESCI 415 Economic Geology – Petroleum  
ESCI 417 Petroleum Industry Economics and Management  
ESCI 420 Modern Exploration Technology (pre-requisite: ESCI 442)  
SOC 367 Environmental Sociology

*Water elective courses (choose up to two):*

CEVE 203 Principles of Environmental Engineering  
CEVE 314 Sustainable Water Purification for Developing World  
CEVE 412 Hydrology and Watershed Analysis

CEVE 415 Water Resources Planning  
CEVE 418 Groundwater Hydrology and Contamination

*Sustainability elective courses (choose up to two):*

ARCH 313 Case Studies in Sustainable Design  
BIOE/CEVE 409 Integrated Approaches to Sustainable Development  
BIOS 323 Conservation Biology  
BIOS 325 Ecology  
CHBE 281 Engineering Sustainable Communities  
CEVE 306 Global Environmental Law and Sustainable Development.  
CEVE 315 Sustainable Technologies for Developing Countries  
CEVE 406 Intro to Environmental Law  
CEVE 492 Reliability of Complex Urban Systems  
ENST 302  
ESCI 513 Soil Science and Sustainability  
STAT 485 Quantitative Environmental Decision Making (requires STAT 305 & 385)  
POLI 441 Common Property Resources  
POLI 331 Environmental Politics and Policy  
POLI 432 Urban Politics