MINOR IN ENERGY AND WATER SUSTAINABILITY

Program Learning Outcomes for the Minor in Energy and Water Sustainability

Upon completing the minor in Energy and Water Sustainability, students will be able to:

1. Apply basic economic concepts of energy and water sustainability including aspects of environmental economics and project-scale economic issues.
2. Understand basic environmental issues applicable to energy and water sustainability.
3. Conduct evaluations of social aspects from a sustainability perspective.
4. Evaluate projects and political systems from the standpoint of energy and water issues as well as more general sustainability issues.
5. Apply sustainability concepts at varying scales and viewpoints, including project level, corporate level, and municipal, state, national, and international levels.
6. Understand the role of climate change on future projects and societies.

Requirements for the Minor in Energy and Water Sustainability

Students pursuing the minor in Energy and Water Sustainability must complete:

• A minimum of 7 courses (19 credit hours) to satisfy minor requirements.
• A minimum of 5 courses (16 credit hours) taken at the 300-level or above.
• A Design Practicum.¹
• A minimum of 1 course (3 credit hours) of the Elective Requirements should be completed for the minor only (not shared or double-counted with a student's major core requirements).

The courses listed below satisfy the requirements for this minor. In certain instances, courses not on this official list may be substituted upon approval of the minor’s academic advisor, or where applicable, the Program Director. (Course substitutions must be formally applied and entered into Degree Works by the minor’s Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/). 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>
</tr>
</thead>
<tbody>
<tr>
<td>CEVE 301</td>
<td>ENGINEERING ECONOMICS AND PROJECT MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>or ECON 480 / ENST 480</td>
<td>ENVIRONMENTAL ECONOMICS</td>
<td></td>
</tr>
<tr>
<td>CEVE 302 / ENGI 302</td>
<td>SUSTAINABLE DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>or CEVE 406 / ENST 406</td>
<td>INTRODUCTION TO ENVIRONMENTAL LAW</td>
<td></td>
</tr>
<tr>
<td>CEVE 307 / EEPS 307 / ENST 307</td>
<td>ENERGY AND THE ENVIRONMENT</td>
<td>3</td>
</tr>
<tr>
<td>CEVE 499</td>
<td>SPECIAL PROBLEMS (at least 1 credit hour)</td>
<td>1</td>
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</tbody>
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Elective Requirements

Select a total of 3 elective courses (minimum of 9 credit hours)
from at least 2 of the following 3 categories:

Energy

Select up to 2 courses from the following:

- ECON 437 / ENST 437 | ENERGY ECONOMICS
- EEPS 437 | EARTH’S NATURAL RESOURCES FOR THE ENERGY TRANSITION
- ELEC 365 / MSNE 365 | NANOMATERIALS FOR ENERGY
- ENST 250 | UNDERSTANDING ENERGY: ENERGY LITERACY AND CIVICS

Water

Select up to 2 courses from the following:

- CEVE 314 / BIOE 365 / GLHT 314 | SUSTAINABLE WATER PURIFICATION FOR THE DEVELOPING WORLD
- CEVE 315 | URBAN WATER SYSTEMS: SOURCES, TREATMENT, DISTRIBUTION, RESOURCE RECOVERY AND REUSE
- CEVE 412 | HYDROLOGY AND WATER RESOURCES ENGINEERING
- CEVE 444 | ENVIRONMENTAL MICROBIOLOGY AND MICROBIAL ECOLOGY

Sustainability

Select up to 2 courses from the following:

- ARCH 313 / ENST 313 | CASE STUDIES IN SUSTAINABLE DESIGN
- ARCH 322 / ENST 322 | CASE STUDIES IN SUSTAINABILITY: THE REGENERATIVE REPOSITIONING OF NEW OR EXISTING RICE CAMPUS BLDGS
- BIOS 280 | SUSTAINABLE DEVELOPMENT AND REPORTING
- BIOS 559 | SUSTAINABILITY IMPACT ASSESSMENTS³
- CEVE 406 / ENST 406 | INTRODUCTION TO ENVIRONMENTAL LAW
- CEVE 421 | CLIMATE RISK MANAGEMENT

Total Credit Hours Required for the Minor in Energy and Water Sustainability: 19
Minor in Energy and Water Sustainability

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>CEVE 492</td>
<td>MODELING AND ANALYSIS OF NETWORKED SYSTEMS</td>
</tr>
<tr>
<td>ENST 210</td>
<td>SUSTAINABLE FUTURES: AN EXPLORATION OF GLOBAL SUSTAINABILITY CHALLENGES AND SOLUTIONS</td>
</tr>
<tr>
<td>ENST 302 / SOCI 304</td>
<td>ENVIRONMENTAL ISSUES: RICE INTO THE FUTURE</td>
</tr>
<tr>
<td>POLI 332</td>
<td>URBAN POLITICS</td>
</tr>
<tr>
<td>STAT 485</td>
<td>ENVIRONMENTAL STATISTICS AND DECISION MAKING</td>
</tr>
</tbody>
</table>

**Total Credit Hours** 19

**Footnotes and Additional Information**

1. Students are required to complete 1 special topics course (CEVE 499), typically during the fall semester of their senior year. Students in engineering and architecture will fulfill this requirement by preparing a report that describes the incorporation of sustainability concepts into their design effort in consultation with their senior (capstone) design course instructor. Students not engaged in a suitable design project will either consult with an extant design group or pursue a project related to their own area of study in consultation with the EWSU advisors.

2. No more than 2 electives courses can be drawn from any 1 of the 3 electives categories. At least 1 elective course must be taken from a different school than the school hosting the student’s major. No more than 2 of the 3 electives can be used to also fulfill a student’s major core requirements. Course offerings of interest that are not listed above can be approved via contacting the minor’s Official Certifier, Jorge Loyo (jorge.loyo@rice.edu).

3. With permission and special registration, only juniors and seniors may register for BIOS 559.

**Program Transfer Credit Guidelines**

Students pursuing the minor in Energy and Water Sustainability should be aware of the following program-specific 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 Energy and Water Sustainability website: https://cee.rice.edu/

**Opportunities for the Minor in Energy and Water Sustainability**

**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/) (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/). Some departments have department-specific Honors awards or designations.

**Additional Information**

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