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 6 courses (16 credit hours) taken at the 300-level or above.
- A Design Practicum.
- A maximum of 2 courses (6 credit hours) applied towards the minor's Elective Requirements can be used to fulfill a student's major 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></td>
<td>Total Credit Hours Required for the Minor in Energy and Water Sustainability</td>
<td>19</td>
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### Minor Requirements

#### Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<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>CEVE 307 / ENST 307 / ESCI 307</td>
<td>ENERGY AND THE ENVIRONMENT</td>
<td>3</td>
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#### Design Practicum

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CEVE 499</td>
<td>SPECIAL PROBLEMS (at least 1 credit hour)</td>
<td>1</td>
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</table>

#### Elective Requirements

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

- **Energy**
  - ECON 437 / ENST 437 | ENERGY ECONOMICS |
  - ESCI 415 | DECISION MAKING AND ECONOMICS IN THE ENERGY INDUSTRY |
  - ESCI 417 | PETROLEUM INDUSTRY ECONOMICS AND MANAGEMENT |
  - ESCI 550 | MODERN EXPLORATION TECHNOLOGY |
  - SOCI 367 / ENST 367 | ENVIRONMENTAL SOCIOLOGY |

- **Water**
  - CEVE 314 / BIOE 365 / GLHT 314 | SUSTAINABLE WATER PURIFICATION FOR THE DEVELOPING WORLD |
  - CEVE 412 | HYDROLOGY AND WATER RESOURCES ENGINEERING |
  - CEVE 418 / ESCI 418 | QUANTITATIVE HYDROGEOLOGY |
  - CEVE 444 | ENVIRONMENTAL MICROBIOLOGY AND MICROBIAL ECOLOGY |

- **Sustainability**
  - ARCH 313 / ENST 313 | CASE STUDIES IN SUSTAINABLE DESIGN |
  - CEVE 406 / ENST 406 | INTRODUCTION TO ENVIRONMENTAL LAW |
  - CEVE 492 | MODELING AND ANALYSIS OF NETWORKED SYSTEMS |
  - CHBE 281 / ENST 281 | ENGINEERING SUSTAINABLE COMMUNITIES |
  - ENST 302 / SOCI 304 | ENVIRONMENTAL ISSUES: RICE INTO THE FUTURE |
  - POLI 432 | URBAN POLITICS |
  - POLI 441 / ENST 441 | GOVERNING THE ENVIRONMENTAL COMMONS |
STAT 485  ENVIRONMENTAL STATISTICS AND DECISION MAKING

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 requirements. Course offerings of interest that are not listed above can be approved via contacting the minor’s Official Certifier, Jim Blackburn (blackbur@rice.edu).

Policies for the Minor in Energy and Water Sustainability

Program Restrictions and Exclusions
Students pursuing the minor in Energy and Water Sustainability should be aware of the following program restriction:

• As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), i.) students may declare their intent to pursue a minor only after they have first declared a major, and ii.) students may not major and minor in the same subject.

Transfer Credit
For Rice University’s policy regarding transfer credit, see 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 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.

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://ceve.rice.edu/sustainability-minor (https://ceve.rice.edu/sustainability-minor/).