Students in the Energy and the Environment concentration focus on renewable energy systems, environmental systems, or both. Students will 1) gain an understanding of the science behind renewable energy from sunlight, wind, geothermal, and biomass sources; 2) perform economic analyses of proposed systems; 3) manage energy systems to blend appropriate sources into reliable, cost-effective, and long-lasting systems; and 4) develop, construct, and operate large-scale, grid-connected renewable energy projects. Students will also have the ability to utilize GIS and other technologies to develop and manage practices for controlling the transport of agricultural and other non-point sources of pollution in the environment, and to implement systems for sustaining and improving water quality, maintaining ecosystems, managing stormwater, and developing optimal irrigation use and drainage systems. Graduates of the Energy & the Environment concentration are prepared for careers with private consulting firms, government and environmental agencies, both small and large technology companies, or for entrance into graduate or professional school.

Prescribed Courses including Campus General Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition I and Speech</td>
<td>Select one of the following: 6-7</td>
<td></td>
</tr>
<tr>
<td>RHET 105 &amp; CMN 101</td>
<td>Writing and Research and Public Speaking (or equivalent (see college Composition I requirement))</td>
<td></td>
</tr>
<tr>
<td>CMN 111 &amp; CMN 112</td>
<td>Oral &amp; Written Comm I and Oral &amp; Written Comm II</td>
<td></td>
</tr>
<tr>
<td>Advanced Composition</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Select from the list below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGCM 220</td>
<td>Communicating Agriculture</td>
<td></td>
</tr>
<tr>
<td>BADM 340</td>
<td>Ethical Dilemmas of Business</td>
<td></td>
</tr>
<tr>
<td>BTW 250</td>
<td>Principles Bus Comm</td>
<td></td>
</tr>
<tr>
<td>BTW 261</td>
<td>Principles Tech Comm</td>
<td></td>
</tr>
<tr>
<td>ECE 316</td>
<td>Ethics and Engineering</td>
<td></td>
</tr>
<tr>
<td>ESE 360</td>
<td>Environmental Writing</td>
<td></td>
</tr>
<tr>
<td>ETMA 311</td>
<td>Humanity in the Food Web</td>
<td></td>
</tr>
<tr>
<td>LEAD 230</td>
<td>Leadership Communications</td>
<td></td>
</tr>
</tbody>
</table>

NRES 419 | Env and Plant Ecosystems | |
PLPA 200 | Plants, Pathogens, and People | |

Cultural Studies
Select one course from Western culture, one from non-Western culture, and one from U.S. minority culture from campus approved lists.

Foreign Language
Coursework at or above the third level is required for graduation.

Quantitative Reasoning I
MATH 234 | Calculus for Business I (or equivalent) | 4 |

Quantitative Reasoning II | 3 or 4 |
Select one of the following:
- ACE 262 | Applied Statistical Methods and Data Analytics I |
- CPSC 241 | Intro to Applied Statistics |
- ECON 202 | Economic Statistics I |
- STAT 107 | Data Science Discovery |

Natural Sciences and Technology
CHEM 102 | General Chemistry I | 4 |
& CHEM 103 | and General Chemistry Lab I |
PHYS 101 | College Physics: Mech & Heat | 5 |
Select one of the following: 4-5
- CHEM 104 | General Chemistry II | |
& CHEM 105 | and General Chemistry Lab II |
OR
- PHYS 102 | College Physics: E&M & Modern |

Humanities and the Arts
Select from campus approved list. 6 |

Social and Behavioral Sciences
ACE 100 | Introduction to Applied Microeconomics | 3-4 |
or ECON 102 | Microeconomic Principles |
Social and behavioral sciences. Select from campus approved list. 3 or 4 |

ACES Prescribed
ACES 101 | Contemporary Issues in ACES | 2 |

ETMA Required
CS 105 | Intro Computing: Non-Tech | 3 |
ETMA 100 | Technical Systems in Agr | 3 |
ETMA 339 | Optimization in Engineering Technology and Management | 3 |
ETMA 421 | Industrial and Agricultural Safety-Injury Prevention | 3 |
or ETMA 422 | Industrial and Agricultural Occupational Illness Prevention |

ETMA 430 | Project Management | 2 |
ETMA 439 | Capstone Experience | 4 |

Business electives 6
A total of 6 hours from the Business Electives list which do not satisfy any other requirements.

ACCY 200 | Fundamentals of Accounting | 3 |
ACCY 201 | Accounting and Accountancy I | 3 |
ACCY 202 | Accounting and Accountancy II | 3 |
ACCY 211 | Understanding Financial Statements | 3 |
Concentration Requirements

Introduction Related Courses

Select two courses from this list:
- ACES 102 Intro Sustainable Food Systems
- CPSC 112 Introduction toCrop Sciences
- ENV 101 Introduction to Energy Sources
- LEAD 260 Foundations of Leadership
- NRES 102 Introduction to NRES
- NRES 201 Introductory Soils
- UP 136 Urban Sustainability

ETMA Electives

Required
- ETMA 352 Land and Water Management Systems
- ETMA 438 Renewable Energy Applications

Select an additional 14 hours from the list below for a total of 20 hours with a minimum of 11 hours at the advanced level:
- ETMA 130 Basics of CAD
- ETMA 132 Basics of Project Management
- ETMA 232 Materials and Construction Systems
- ETMA 233 Metallurgy & Welding Processes
- ETMA 234 Wiring, Motors, and Control Systems
- ETMA 295 Undergrad Research or Thesis
- ETMA 317 Residential Housing Design
- ETMA 372 Environ Control & HVAC Systems
- ETMA 376 UG Honors Research or Thesis
- ETMA 445 Managing Industrial and Agricultural Safety Risks
- ETMA 438 Elec Computer Control Systems
- ETMA 496 Independent Study

Concentration Electives

Select 18 hours from the list below with a minimum of 12 hours at the advanced level:

At least one of:
- ACE 210 Environmental Economics
- ACE 310 Natural Resource Economics
- ACE 406 Environmental Law
- ACE 410 Energy Economics
- ACE 411 Environment and Development

At least one of:
- NRES 219 Applied Ecology
- NRES 370 Environmental Sustainability
- NRES 419 Env and Plant Ecosystems
- NRES 420 Restoration Ecology
- NRES 425 Natural Resources Law & Policy
- NRES 426 Renewable Energy Policy
- NRES 429 Aquatic Ecosystem Conservation
- NRES 438 Soil Nutrient Cycling
- NRES 439 Env and Sustainable Dev
- NRES 471 Pedology
- NRES 474 Soil and Water Conservation
- NRES 477 Introduction to Remote Sensing

Introductory Related Courses

Select 2 courses from the list for your concentration.

ETMA Electives

A total of 20 hours from the list for your concentration with a minimum of 11 hours at the advanced level.

Concentration Electives

Select 18 hours from the list for your concentration, which do not satisfy any other requirements, with a minimum of 12 hours at the advanced level.

Total Hours

ETMAS majors will need 40 hours of upper-level courses (300- and 400-level) to satisfy the campus minimum requirement of 40 hours of advanced coursework.

Information listed in this catalog is current as of 07/2023
for the degree of Bachelor of Science Major in Engineering Technology & Management for Agricultural Systems: Energy & the Environment concentration

Sample Sequence
This sample sequence is intended to be used only as a guide for degree completion. All students should work individually with their academic advisors to decide the actual course selection and sequence that works best for them based on their academic preparation and goals. Enrichment programming such as study abroad, minors, internships, and so on may impact the structure of this four-year plan. Course availability is not guaranteed during the semester indicated in the sample sequence.

Students must fulfill their Language Other Than English requirement by successfully completing a third level of a language other than English. For more information, see the corresponding section on the Degree General and Education Requirements page (http://catalog.illinois.edu/general-information/degree-general-education-requirements/).

<table>
<thead>
<tr>
<th>First Year</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Semester Hours</td>
<td>Second Semester Hours</td>
</tr>
<tr>
<td>ETMA 100</td>
<td>3</td>
<td>CHEM 102</td>
</tr>
<tr>
<td>ACES 101</td>
<td>2</td>
<td>CHEM 103</td>
</tr>
<tr>
<td>RHET 105 or CMN 101</td>
<td>4</td>
<td>CMN 101 or RHET 105</td>
</tr>
<tr>
<td>ACE 100</td>
<td>4</td>
<td>MATH 234</td>
</tr>
<tr>
<td>Language Other than English (3rd level)</td>
<td>4</td>
<td>ETMA Elective</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Semester Hours</td>
<td>Second Semester Hours</td>
</tr>
<tr>
<td>CHEM 104</td>
<td>3</td>
<td>PHYS 101</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>16</td>
</tr>
</tbody>
</table>

Total Hours 126
for the degree of Bachelor of Science Major in Engineering Technology & Management for Agricultural Systems: Energy & the Environment concentration in the Department of Agricultural & Biological Engineering.

Agricultural & Biological Engineering
Agricultural & Biological Engineering Website (https://abe.illinois.edu/)
1304 W. Pennsylvania Ave.
Urbana, IL 61801
217-333-3570
Email: abe@illinois.edu

College of Agricultural, Consumer & Environmental Sciences