ENGINEERING TECHNOLOGY & MANAGEMENT FOR AGRICULTURAL SYSTEMS: ENERGY & THE ENVIRONMENT, BS

for the degree of Bachelor of Science Major in Engineering Technology & Management for Agricultural Systems: Energy & the Environment concentration

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>RHET 105 &amp; CMN 101</td>
<td>Writing and Research and Public Speaking (or equivalent (see college Composition I requirement))</td>
<td>6-7</td>
</tr>
<tr>
<td>CMN 111 &amp; CMN 112</td>
<td>Oral &amp; Written Comm I and Oral &amp; Written Comm II</td>
<td>3-4</td>
</tr>
<tr>
<td>NRES 419</td>
<td>Env and Plant Ecosystems</td>
<td>9</td>
</tr>
<tr>
<td>PLPA 200</td>
<td>Plants, Pathogens, and People</td>
<td></td>
</tr>
<tr>
<td>Cultural Studies</td>
<td>Select one course from Western culture, one from non-Western culture, and one from U.S. minority culture from campus approved lists</td>
<td></td>
</tr>
<tr>
<td>Foreign Language</td>
<td>Coursework at or above the third level is required for graduation</td>
<td></td>
</tr>
<tr>
<td>Quantitative Reasoning I</td>
<td>MATH 234 Calculus for Business I (or equivalent)</td>
<td>4</td>
</tr>
<tr>
<td>Quantitative Reasoning II</td>
<td>Select one of the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACE 262</td>
<td>Applied Statistical Methods and Data Analytics I</td>
</tr>
<tr>
<td></td>
<td>CPSC 241</td>
<td>Intro to Applied Statistics</td>
</tr>
<tr>
<td></td>
<td>ECON 202</td>
<td>Economic Statistics I</td>
</tr>
<tr>
<td></td>
<td>STAT 107</td>
<td>Data Science Discovery</td>
</tr>
<tr>
<td>Natural Sciences and Technology</td>
<td>CHEM 102 General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; CHEM 103</td>
<td>and General Chemistry Lab I</td>
<td></td>
</tr>
<tr>
<td>PHYS 101</td>
<td>College Physics: Mech &amp; Heat</td>
<td>5</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>CHEM 104 General Chemistry II</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>&amp; CHEM 105</td>
<td>and General Chemistry Lab II</td>
</tr>
<tr>
<td>OR</td>
<td>PHYS 102</td>
<td>College Physics: E&amp;M &amp; Modern</td>
</tr>
<tr>
<td>Humanities and the Arts</td>
<td>Select from campus approved list</td>
<td>6</td>
</tr>
<tr>
<td>Social and Behavioral Sciences</td>
<td>ACE 100 Introduction to Applied Microeconomics</td>
<td>3-4</td>
</tr>
<tr>
<td>or ECON 102</td>
<td>Microeconomic Principles</td>
<td></td>
</tr>
<tr>
<td>Social and behavioral sciences. Select from campus approved list</td>
<td>3 or 4</td>
<td></td>
</tr>
<tr>
<td>ACES Prescribed</td>
<td>ACES 101 Contemporary Issues in ACES</td>
<td>2</td>
</tr>
<tr>
<td>ETMA Required</td>
<td>CS 105 Intro Computing: Non-Tech</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ETMA 100 Technical Systems in Agr</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ETMA 339 Optimization in Engineering Technology and Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ETMA 421 Industrial and Agricultural Safety-Injury Prevention</td>
<td>3</td>
</tr>
<tr>
<td>or ETMA 422</td>
<td>Industrial and Agricultural Occupational Illness Prevention</td>
<td></td>
</tr>
<tr>
<td>ETMA 430</td>
<td>Project Management</td>
<td>2</td>
</tr>
<tr>
<td>ETMA 439</td>
<td>Capstone Experience</td>
<td>4</td>
</tr>
<tr>
<td>Business electives</td>
<td>A total of 6 hours from the Business Electives list which do not satisfy any other requirements</td>
<td>6</td>
</tr>
<tr>
<td>ACCY 200</td>
<td>Fundamentals of Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCY 201</td>
<td>Accounting and Accountancy I</td>
<td>3</td>
</tr>
<tr>
<td>ACCY 202</td>
<td>Accounting and Accountancy II</td>
<td>3</td>
</tr>
<tr>
<td>ACCY 211</td>
<td>Understanding Financial Statements</td>
<td>3</td>
</tr>
</tbody>
</table>

Information listed in this catalog is current as of 10/2023
## Concentration Requirements

### Code | Title | Hours
--- | --- | ---
ACE 210 | Environmental Economics | 3
ACE 240 | Personal Financial Planning | 3
ACE 310 | Natural Resource Economics | 3
ACE 345 | Finan Decision Indlv Sm Bus | 3
ACE 346 | Tax Policy and Finan Planning | 3
ACE 432 | Advanced Farm Management | 3 or 4
ACE 435 | Global Agribusiness Management | 3
AGCM 270 | Ag Sales and Persuasive Communication | 3
BADM 300 | The Legal Environment of Bus | 3
BADM 310 | Mgmt and Organizational Beh | 3
BADM 311 | Leading Individuals and Teams | 3
BADM 312 | Designing and Managing Orgs | 3
BADM 313 | Strategic Human Resource Management | 3
BADM 314 | Leading Negotiations | 3
BADM 320 | Principles of Marketing | 3
BADM 322 | Marketing Research | 3
BADM 323 | Marketing Communications | 3
BADM 326 | Pricing Strategy | 3
FIN 221 | Corporate Finance | 3
FIN 230 | Introduction to Insurance | 3
LER 290 | Introduction to Employment Law | 3
LEAD 140 | Harnessing Your Interpersonal Intelligence | 2
LEAD 260 | Foundations of Leadership | 3
LEAD 340 | Leadership Ethics & Society: Addressing Contemporary Challenges | 3
LEAD 380 | Leadership in Groups and Teams | 3
LEAD 440 | Interpersonal Intelligence for Professional Success | 2
SE 361 | Emotional Intelligence Skills | 3
SE 400 | Engineering Law | 3 or 4
TE 230 | Design Thinking/Need-Finding | 3
TE 250 | From Idea to Enterprise | 2
TE 333 | Creativity, Innovation, Vision | 4
TE 360 | Lectures in Engineering Entrepreneurship | 1
TE 450 | Startups: Incorporation, Funding, Contracts, & Intellectual Property | 3

### Introductory Related Courses

Select two courses from this list.

- ASES 102: Intro Sustainable Food Systems
- CPSC 112: Introduction to Crop Sciences
- ENVS 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 Mgt 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 Sys
- ETMA 233: Metallurgy & Welding Processes
- ETMA 234: Wiring, Motors and Control Sys
- ETMA 295: Undergrad Research or Thesis
- ETMA 371: Residential Housing Design
- ETMA 372: Environ Control & HVAC Systems
- ETMA 396: UG Honors Research or Thesis
- ETMA 425: Managing Industrial and Agricultural Safety Risks
- ETMA 435: Elec Computer Ctrl Sys
- 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

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NRES 488  Soil Fertility and Fertilizers

At least one of:

- UP 405  Watershed Ecology and Planning
- UP 406  Urban Ecology
- UP 446  Sustainable Planning Seminar
- UP 466  Energy & the Built Environment
- UP 480  Sustainable Design Principles

May select from the below list to achieve 18 hours:

- AGCM 330  Environmental Communications
- CEE 320  Construction Engineering
- CEE 330  Environmental Engineering
- CPSC 215  The Prairie and Bioenergy
- CPSC 336  Tomorrow's Environment
- CPSC 415  Bioenergy Crops
- CPSC 416  Native Plants, Pollinators, & Food Ecosystems
- CPSC 431  Plants and Global Change
- CPSC 437  Principles of Agroecology
- ESE 465  Transportation & Sustainability
- ESE 482  Challenges of Sustainability
- GLBL 201  Energy Systems

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/).

First Year

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

17 14

Second Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 104</td>
<td>3 PHYS 101</td>
<td>5 ETMA Elective</td>
</tr>
</tbody>
</table>

18 16

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

Information listed in this catalog is current as of 10/2023
College of Agricultural, Consumer & Environmental Sciences Website
(https://aces.illinois.edu/)

ACES Office of Academic Programs
128 Mumford Hall
1301 West Gregory Drive
Urbana, IL 61801

Advising
Phone: 217-333-3570
Email: tsm-etm-abe-advising@rt.aces.illinois.edu
Advising Website (https://abe.illinois.edu/academics/advising/)

Admissions
ACES Undergraduate Admissions (https://aces.illinois.edu/admissions/)
visitACES@illinois.edu
217-333-3380
University of Illinois Undergrad Admissions (https://
www.admissions.illinois.edu/)

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