The graduate certificate in Bioenergy is designed specifically for current and aspiring practitioners who seek advanced skills for growing the bioenergy industry. To accommodate participation by working professionals the program is offered through Penn State’s World Campus by Renewable Energy and Sustainability Systems (RESS) graduate program.

Effective Semester: Fall 2017  
Expiration Semester: Summer 2022

Admission Requirements

Applicants apply for admission to the program via the Graduate School application for admission (http://gradschool.psu.edu/prospective-students/how-to-apply/). Requirements listed here are in addition to Graduate Council policies listed under GCAC-300 Admissions Policies (http://gradschool.psu.edu/graduate-education-policies/). International applicants may be required to satisfy an English proficiency requirement; see GCAC-305 Admission Requirements for International Students (http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-305-admission-requirements-international-students/) for more information.

A background in chemistry and thermodynamics is recommended.

Certificate Requirements

Requirements listed here are in addition to requirements listed in Graduate Council policy GCAC-212 Postbaccalaureate Credit Certificate Programs (http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-212-postbaccalaureate-credit-certificate-programs/).

Bioenergy certificate students earn the certificate and 12 graduate credits by earning a grade of ‘C’ or better in four prescribed online courses (note that grade requirements for using these courses in other graduate programs may be different). Students who are subsequently admitted to the Renewable Energy and Sustainability Systems (RESS) degree program may count credits earned in the certificate program toward the RESS degree, subject to restrictions outlined in GCAC-309 Transfer Credit (http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/transfer-credit/). Certificate students who wish to have certificate courses applied towards a graduate degree in RESS must apply and be admitted to that degree program. Admission into the RESS degree program is a separate step and is not guaranteed.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABE 884</td>
<td>Biomass Energy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ABE 885</td>
<td>Biomass Harvesting and Logistics</td>
<td>3</td>
</tr>
<tr>
<td>ABE 888</td>
<td>Conversion Technologies for Bioenergy Production</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses

Graduate courses carry numbers from 500 to 699 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

Learning Outcomes

1. **APPL TECH**: Students will be able to demonstrate knowledge for applied technologies used in production and conversion of biomass into transportation fuels, heat, power, electricity, chemicals, and other value-added products.
2. **LOGISTICS**: Students will be able to identify and select suitable machine systems for a specific biomass harvesting and handling scenarios based on quantitative evaluations and cost analysis.
3. **CONVERSION**: Students will be able to demonstrate knowledge for conversions of raw agricultural materials into bioenergy with a focus on liquid biofuels.
4. **FEEDSTOCKS**: Students will be able to assess characteristics, production, and improvement of the major types of plant biomass feedstocks that are used to produce biomass energy.

Contact

| Campus          | World Campus  
|-----------------|--------------|
| Graduate Program Head | Ali Demirci  
| Program Contact       | Daniel Edward Ciolkosz  
|                   | John A Dutton e-Education Institute  
|                   | 2217 Earth Engineering Sciences Bldg.  
|                   | University Park PA 16802  
|                   | dec109@psu.edu  
|                   | (814) 863-3484  

Program Website

View (https://www.ress.psu.edu/certificates/)