Biorenewable Resources and Technology

(Interdisciplinary Graduate Program)

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Janice Meyer, BRT Secretary

Over 160 ISU faculty affiliated members, 29 departments in all 7 colleges and 20 research centers and institutes involved in this highly interdisciplinary graduate program. A complete and up-to-date listing is maintained at: http://www.biorenew.iastate.edu

Graduate Study

The graduate program in Biorenewable Resources and Technology (BRT) offers students advanced study in utilizing plant and crop-based resources in the production of biobased products (fuels, chemicals, materials, and energy). The BRT program was the first graduate program in biorenewable resources established in the United States. This multi-disciplinary program offers the degrees of master of science and doctor of philosophy in Biorenewable Resources and Technology, and a minor to students taking major work in other departments. The curriculum is designed to encourage students to obtain co-major degrees in Biorenewable Resources and Technology and a more traditional science or engineering discipline. A thesis is required for the master of science degree.

Prerequisite to major graduate work is a bachelor’s degree or prior graduate training in engineering or a physical or biological discipline, including agricultural sciences.

Core Required Courses: 501, 506B &C, 590, and 591L or BRT 507

The core required courses (6 credits min. required) for the Biorenewable Resources and Technology graduate program include:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRT 501</td>
<td>Fundamentals of Biorenewable Resources</td>
<td>3</td>
</tr>
<tr>
<td>BRT 506A</td>
<td>Biobased Products Seminar: Online (Certificate only)</td>
<td>1</td>
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<tr>
<td>BRT 506B</td>
<td>Biobased Products Seminar: Seminars and Research Symposium Attendance</td>
<td>R</td>
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<tr>
<td>BRT 506C</td>
<td>Biobased Products Seminar: Research Presentations</td>
<td>R</td>
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<tr>
<td>BRT 590</td>
<td>Special Topics</td>
<td>1-3</td>
</tr>
<tr>
<td>BRT 591L</td>
<td>Biorenewable Resources Laboratory (OR)</td>
<td>1</td>
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<tr>
<td>BRT 507</td>
<td>Entrepreneurship in Biorenewables</td>
<td>1</td>
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Total Credits: 8-10

Students must complete "approved" core elective courses from at least three of the four bioeconomic development barrier areas: plant science, production, processing, and utilization. These are selected in consultation with the student's Program of Study (POS) committee. Additionally, students are to complete the determined amount of elective credits required for their degree, and in consultation with their POS committee, as well as research credits.

Graduates of the program will be equipped with skills to design, develop and/or manage cost effective and environmentally attractive technologies and systems for producing fuels, chemicals, materials, foods and energy from biorenewable resources.

Information on application procedures, specific requirements of the major and the online BRT Graduate Certificate can be obtained from the following Internet address: http://www.biorenew.iastate.edu

Courses primarily for graduate students, open to qualified undergraduates:

BRT 501. Fundamentals of Biorenewable Resources.

(Cross-listed with A E). (3-0) Cr. 3. S.

Prereq: Undergraduate training in an engineering or physical or biological discipline or degree in agriculture or economics

Introduction to the science and engineering of converting biorenewable resources into bioenergy and biobased products. Survey of biorenewable resource base and properties; description of biobased products; methods of biorenewable resource production; processing technologies for fuels, chemicals, materials, and energy; environmental impacts; economics of biobased products and bioenergy.
Biorenewable Resources and Technology

BRT 591L. Biorenewable Resources Laboratory. (0-3) Cr. 1. Repeatable, maximum of 2 times. F.S.S.S. Prereq: Permission of student’s major professor and instructor
Special topics laboratory and research experience in biorenewable resources and technology that affords an experience beyond thesis-focused research. To be designed in consultation with the student’s major professor and instructor. A laboratory report is required. For student in the BRT program, BRT 591L may be taken twice. For student in the BRT program, BRT 591L may be taken twice.

Courses for graduate students:

BRT 610. Food & Bioprocessing Enzymology. (Cross-listed with FS HN). (2-3) Cr. 3. Alt. F., offered 2012. Prereq: FS HN 311 or FS HN 411 or FS HN 502 or BBMB 404
Properties of enzymes important in food processing including flavor, texture and color and in biofuels & bioprocessing. Quantitative evaluation of substrates, enzyme inhibitors, pH, pressure and temperature on enzyme activity. Experimental determination of specificity and mechanisms important to food and bioprocessing biochemistry. Techniques to purify food and bioprocessing enzymes.

BRT 699. Research.
Cr. arr. Repeatable. F.S.S.S. Prereq: Permission of student's major professor