BIORENEWABLE SYSTEMS, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Degree Requirements

For the Bachelor of Science degree in BioRenewable Systems, a minimum of 121 credits is required for the BioProducts Option and the Agricultural Systems Management Option:

Requirement	Credits
General Education	45
Requirements for the Major	106-109

30 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses; 6 credits of GS courses; 9 credits of GWS courses.

Requirements for the Major

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
ACCTG 211	Financial and Managerial Accounting for Decision Making	4
BRS 350	Introduction to Life Cycle Assessment	3
BRS 422	Energy Analysis in Agricultural and Biorenewable Systems	3
BRS 426	Safety and Health in Agriculture and Biorenewable Industries	3
BRS 428	Electric Power and Instrumentation	3
BRS 429W	Agricultural and Biorenewable Systems Analysis and Management	3
BRS 430W	Agricultural and Biorenewable Systems Management Capstone 1	1
BRS 431W	Agricultural and Biorenewable Systems Management Capstone 2	2
BRS 490	Agricultural and Biorenewable Systems Management Colloquium	1
CHEM 110	Chemical Principles I	3
CHEM 111	Experimental Chemistry I	1
Prescribed Courses: Require a grade of C or better		
AGBM 106	Agribusiness Problem Solving	3
BRS 221	Engineering Principles of Agricultural and Biorenewable Systems	3
BRS 391	Communication Skills for BE and ABSM Students	2
BRS 392	Leadership and Ethics for BE and ABSM Students	2
EDSGN 100	Cornerstone Engineering Design	3
ENGL 15	Rhetoric and Composition	3
Additional Courses		
AGBM 101	Economic Principles of Agribusiness Decision Making	3
or ECON 102	Introductory Microeconomic Analysis and Policy	
BA 303	Marketing	3
or AGBM 302	Food Product Marketing	
BIOL 11 & BIOL 12	Introductory Biology I and Introductory Biology II	4
or BIOL 110	Biology: Basic Concepts and Biodiversity	
EBF 200	Introduction to Energy and Earth Sciences Economics	3
or ECON 104	Introductory Macroeconomic Analysis and Policy	
PHYS 211	General Physics: Mechanics	4
or PHYS 250	Introductory Physics I	
Select one of the following:		3-4
BA 241 & BA 242	Legal Environment of Business and Social and Ethical Environment of Business	
BA 243	Social, Legal, and Ethical Environment of Business	
BLAW 243	Legal Environment of Business	
Additional Courses: Require a grade of C or better		
CAS 100A	Effective Speech	3
or CAS 100B	Effective Speech	
MATH 110	Techniques of Calculus I	4
or MATH 140	Calculus With Analytic Geometry I	
STAT 200	Elementary Statistics	3-4
or STAT 240	Introduction to Biometry	
or STAT 250	Introduction to Biostatistics	
Requirements for the Option		
Select an option		33-34

Requirements for the Option

Agricultural Systems Management Option (33-34 credits)

Code	Title	Credits
Prescribed Courses		
SOILS 101	Introductory Soil Science	3
Prescribed Courses: Require a grade of C or better		
ASM 310	Power Transmission in Agriculture	3
ASM 327	Soil and Water Resource Management	3
Additional Courses		
AGRO 28	Principles of Crop Management	3
or HORT 101	Horticultural Science	
Select 3-4 credits of the following:		3-4
ANSC 100	Introduction to Animal Industries	
ANSC 201	Animal Science	
ANSC 207/FDSC 207 and ANSC 208/FDSC 208		
Supporting Courses and Related Areas		
Select 18 credits of specialization courses in consultation with an adviser. At least 12 credits must be at 200-400 level.		18

Bioproducts Option (33 credits)

Code	Title	Credits
Prescribed Courses		
BRS 300	Introduction to Agricultural and Biorenewable Products	3

BRS 411	Bioproducts Science and Technology	3
BRS 417	Processing and Manufacturing Systems for Bioproducts	3
BRS 423	Deterioration and Protection of Bioproducts	3
Prescribed Courses: Require a grade of C or better		
BRS 402	Foundations of Sustainable Business	3
Supporting Courses and Related Areas		
Select 3 credits in leadership/entrepreneurship		3
Select 15 credits of specialization courses in consultation with an adviser. At least 9 credits must be at 200-400 level.		15

General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required and Inter-Domain courses do not meet this requirement.)

- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)

- **Arts (GA):** 3 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 3 credits
- **Social and Behavioral Sciences (GS):** 3 credits
- **Natural Sciences (GN):** 3 credits

Integrative Studies

- **Inter-Domain Courses (Inter-Domain):** 6 credits

Exploration

- **GN,** may be completed with Inter-Domain courses: 3 credits
- **GA, GH, GN, GS, Inter-Domain courses.** This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher**:** 6 credits

University Degree Requirements

First Year Engagement

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80)). For more information, check the Suggested Academic Plan for your intended program.