

## Bachelor of Science in Agriculture Major: Sustainable Plant Systems Specialization: Plant Biosciences

*Plant Biosciences is a broad study of plant biology including plant form and function, diversity, reproduction, evolution, and uses of plants. This specialization is ideal for students wishing to pursue a diverse array of career pathways or pursue graduate study in the field of plant biology and related plant disciplines. Students in this major will complete a minimum of 121 hours outlined as follows.*

General Education Requirements		
Requirement	Course Options	Hours
GE Launch Seminar	<b>GENED 1201</b>	1
Writing and Information Literacy	Major requirement: <b>ENGLISH 1110 *</b> (or <i>Student Choice – see below</i> )	3
Mathematical & Quantitative Reasoning/Data Analysis	Major requirement: <b>MATH 1130, 1148, 1150, 1151, or 1156 *</b> (or <i>Student Choice – see below</i> )	4-5
Literary, Visual and Performing Arts	<b>Student Choice</b>	3
Historical & Cultural Studies	<b>Student Choice</b>	3
Natural Science	Major requirement: <b>BIOLOGY 1113 *</b> (or <i>Student Choice – see below</i> )	4
Social & Behavioral Sciences	Major requirement: <b>AEDECON 2001 or ECON 2001.01 *</b> (or <i>Student Choice – see below</i> )	3
Race, Ethnic and Gender Diversity	<b>Student Choice</b>	3
Theme: <b>Citizenship for a Diverse &amp; Just World<sup>a</sup></b>	<b>Student Choice</b>	4-6
Theme: <b>Student Choice<sup>a</sup></b>	<b>Student Choice</b>	4-6
GE Reflection	<b>GENED 4001</b>	1
<b>Credit Hours:</b>		<b>33-38</b>

\* Indicates a pre/corequisite course for this major that also satisfies this GE category. If a student makes an alternative selection in this GE category, **they must also complete this course.**

B.S. in Agriculture Degree Requirements		
Requirement	Course Options	Hours
College & Department Survey	<b>FAES 1100 (0.5) &amp; HCS 1100 (0.5)</b>	1
Oral Expression	<b>AGRCOMM 3130 or COMM 2110</b>	3
Additional Science	<b>CHEM 1110, 1210, or 1220</b>	5
Internship	<b>FAES 3191 &amp; HCS 4191.01</b>	2
Minor Equiv. <sup>b</sup>	See pg. 2	15-18
<b>Credit Hours:</b>		<b>26-29</b>

General Education	<b>33-38</b>
Degree Requirements	<b>26-29</b>
Major Supporting Courses (see pg. 2)	<b>8</b>
Major	<b>45-46</b>
Open Electives	<b>0-9</b>
<b>Minimum Total Credit Hours</b>	<b>121</b>

<sup>a</sup> Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ♦ symbol.

<sup>b</sup> Students in this program complete a group of courses called a minor equivalent. Declaring an additional minor is not required.

<sup>c</sup> Only up to 6 credits of any combination of 4193, 4998, 4999, or 4999H can count towards major electives.

<sup>d</sup> If not selected as major capstone.

Major Coursework		
Course	Title	Hours
<b>HCS 2202</b>	Form and Function in Cultivated Plants	4
<b>HCS 2201 -or-</b>	Ecology of Managed Plant Systems (prior to AU22)	4
<b>HCS 2204 &amp;</b>	Ecology of Managed Plant Systems ♦ (3)	
<b>HCS 2205</b>	Ecology of Managed Plant Systems Lab (1)	
<b>HCS 2260</b>	Data Analysis and Interpretation for Decision Making	3
<b>HCS 3100 -or- 3200 -or- 3470</b>	Intro to Agronomy -or- Intro to Horticulture -or- Intro to Turfgrass Mgmt.	3
<b>HCS 3220</b>	Crop Origins and Diversity	2
<b>HCS 3310</b>	Crop Responses to the Environment	3
<b>HCS 5325 -or- MOLGEN 4500</b>	Plant Genetics -or- General Genetics	3
<b>HCS 5621</b>	Physiology of Cultivated Plants	3
<b>HCS 5622 -or- BIOCHEM 4511</b>	Biochemical Processes in Cultivated Plants -or- Introduction to Biological Chemistry	3-4
<b>ENR 3000</b>	Soil Science	3
<b>ENR 3001</b>	Soil Science Laboratory	1
<i>Select one capstone course:</i>		3
<b>HCS 5100</b>	Advanced Cropping Systems	
<b>HCS 5200</b>	Advanced Horticultural Principles and Practices	
<b>HCS 5602</b>	The Ecology of Agriculture	
<b>Major Electives: Select 10 credit hours from:</b>		
<b>HCS 2307</b>	Sustainable Agr Practical Exp	2
<b>HCS 3320</b>	Plant Propagation	3
<b>HCS 3420</b>	Seed Science	3
<b>HCS 3521</b>	Greenhouse Systems and Management	2
<b>HCS 4193</b>	Individual Studies	1-3
<b>HCS 4300</b>	Hydroponic Crop Production	2
<b>HCS 4301</b>	Hydroponic Crop Production Lab	1
<b>HCS 4520</b>	Medicinal Plants	2
<b>HCS 4570</b>	Turfgrass Management and Science	3
<b>HCS 4998, 4999, or 4999H<sup>c</sup></b>	Undergraduate Research, Research with Distinction, or Honors Research with Distinction	1-6
<b>HCS 5097.01-.04 &amp; 5797.01-.04</b>	Study Abroad Pre-Departure & Study Abroad	4
<b>HCS 5100<sup>d</sup></b>	Advanced Cropping Systems	3
<b>HCS 5200<sup>d</sup></b>	Advanced Horticultural Systems	3
<b>HCS 5411</b>	Domestication and Utilization of Agronomic Crops	3
<b>HCS 5412</b>	Agroecology of Grasslands and Prairies	3
<b>HCS 5422</b>	Biol & Mgmt. of Weeds and Invasive Plants	3
<b>HCS 5450</b>	Vegetable Crop Production and Physiology	3
<b>HCS 5460</b>	Fruit Crop Physiology and Production	3
<b>HCS 5602<sup>d</sup></b>	Ecology of Agriculture	3
<b>HCS 5625</b>	Applied Plant Biotechnology	2
<b>HCS 5825</b>	Plant Breeding	2
<b>HCS 5887</b>	Introduction to Experimental Design	3
<b>Credit Hours:</b>		<b>45-46</b>

Major Supporting Coursework		
Course	Title	Hours
BIOLOGY 1114	Biological Sciences: Form, Function, Diversity, and Ecology	4
CHEM 2310 or 2510 *	Introductory Organic Chem or Organic Chem I	4
Credit Hours:		8

Minor Equivalent (15-18 hours)*		
EEOB 3310.01 or .02	Evolution	4
EEOB 3410	Ecology	4
Select an additional 7-10 hours from supporting electives below:		
Course	Title	Hours
AGSYSMT 3580	UAS and Remote Sensing in Agriculture	3
HCS/AGSYSMT 3585	Digital Agriculture ❖	3
HCS/AGSYSMT 3586	Digital Agriculture Laboratory ❖	1
CHEM 2520	Organic Chemistry II	4
CHEM 2540	Organic Chemistry Laboratory I	2
CHEM 2550	Organic Chemistry Laboratory II	2
EEOB 3320	Organismal Diversity	3
EEOB 4240	Ecology & Evolution of Plants and People	3
EEOB 5450	Population Ecology	3
ENR 3321	Biology and Identity of Woody Forest Plants	3
ENR 3700	Introduction to Spatial Information for ENR	3
ENR 5261	Environmental Soil Physics	3
ENR 5263	Biology of Soil Ecosystems	3
ENR 5273	Environmental Fate & Impact of Contamination in Soil & Water	3
ENR 5274	Ecosystem Simulation	3
ENTMLGY 4000	General Entomology	3
ENTMLGY 5420	Insect Behavior	3
ENTMLGY 6410	Insect Ecology & Evolution	3
GEOG 5900	Weather, Climate, & Global Warming	3
MOLGEN 4501	General Genetics Laboratory	1
MOLGEN 4502	Expanded General Genetics Laboratory	2
MOLGEN 5623	Genetics and Genomics	2
MOLGEN 5630	Plant Physiology	3
MOLGEN 5643	Plant Anatomy	3
MOLGEN 5701	DNA Transactions and Gene Regulation	3
MOLGEN 5735	Plant Biochemistry	3
PLNTPTH 3001	General Plant Pathology	3
PLNTPTH 3002	General Plant Pathology Lab	2
PLNTPTH 5010	Phytopathology	2
PLNTPTH 5020	Introductory Plant Virology	2
PLNTPTH 5030	Plant Nematology	2
PLNTPTH 5040	Science of Fungi: Mycology Lecture	3

\* Students interested in a chemistry-enriched minor curriculum should plan to take CHEM 1220 and CHEM 2510.

– CHEM 2310 prerequisites: CHEM 1110, 1220 (122), 1250 (125), 1620, or 1920H.

– CHEM 2510 prerequisites: CHEM 1220 (123), 1620 or 1920H (203H).

\* Students interested in a Molecular Genetics enriched minor curriculum should plan to take MOLGEN 4500.

\* Students interested in an advanced plant pathology (5000-level) minor curriculum should plan to take PLNTPTH 3001 and 3002.

#### **Policies and General Requirements for Degree**

- A minimum of 121 total credit hours. Remedial coursework (English 1109; EDUTL 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1010; Mathematics 1040, 1050, 1073, 1074, 1075) do not count toward the 121-hour minimum requirement for the BS degree.
- A minimum of 30 semester hours of credit earned through regular course enrollment at this University, and regular course enrollment in the last semester in the College of Food, Agricultural, and Environmental Sciences.
- A cumulative point-hour ratio of at least 2.00 on all coursework completed at The Ohio State University as well as at least a 2.00 in the major.
- If a major-required course or major elective is a GE Theme course, two 3-4 cr courses (no more than one per theme area) is permitted to double count in the GE and major hours. GE Theme courses are indicated with a ❖ symbol.
- Students are encouraged to participate in education abroad opportunities. Consult with your advisor for how education abroad credit applies to your degree or consider the CFAES Global Option.
- Students must complete a minimum of 40 hours in major/major supporting coursework with at least 12 hours taken from the academic unit(s) offering the major at OSU in the baccalaureate program.
- Courses required in the major (including major supporting courses and major electives) may **not** be taken pass/non-pass.
- Coursework taken as open electives may include a maximum of 4 credit hours of physical activity courses (all 1139-1197 courses), and a maximum of 4 credit hours of campus music organizations.
- A college maximum of six hours of individual studies courses (x193) can be applied toward graduation; some majors may have a lower maximum.
- Students of CFAES must complete an internship of 1-2 hours as a requirement for degree. Any additional internship credit hours may count towards major hours (consult with your advisor). A college maximum of six hours of internship credit can be applied toward graduation; some majors may have a lower maximum.
- A maximum of three credits of 3488 can be applied toward graduation although some majors may have a lower maximum. A cumulative point-hour ratio of 2.0 is required to register for 3488 credit.
- Credit hours for 4999 ("with Research Distinction") and 4999H ("with Honors Research Distinction") are repeatable to maximum of six hours.
- **An application for degree must be submitted online at least two semesters prior to the intended graduation term. Application found at: <https://students.cfaes.ohio-state.edu/academics/undergraduate/graduation>**

#### **Policies and General Requirements for Minors/Minor Equivalent**

- The minor/minor equivalent must contain a minimum of 12 credit hours distinct from the major and/or additional minors (i.e., if a minor requires more than 12 credit hours, a student is permitted to overlap those hours beyond 12 with the major or with another minor).
  - A 2.00 cumulative point-hour ratio is required in the minor/minor equivalent with a minimum C- grade for any course to be listed in the minor or minor equivalent (includes transfer credit).
  - For programs requiring a minor: minors should be declared by the time students complete 60 hours.
  - A student is permitted to count up to 6 credit-hours of transfer and/or EM credit in the minor or minor equivalent.
- Coursework graded Pass/Non-Pass cannot count in the minor. No more than 3 credit-hours of course work graded S/U may count toward the minor. Maximum of 3 credit-hours of xx93 are allowed to count in the minor.

**4-Year Course Plan**  
**B.S. in Agriculture**  
**Major: Sustainable Plant Systems**  
**Specialization: Plant Biosciences**

*This model plan of study is presented as a suggested path to graduate in four years. It is intended to be a useful guide; however, each student is unique and should review the Degree Requirements for their catalog year and work with their advisor to develop an individualized course plan that best fits their personal academic background and goals.*

*NOTE: This sheet should not be used in isolation. To graduate in a timely manner, students must consult their academic advisor on a regular basis.*

<b>Freshman Year</b>	<b>Autumn Semester</b>			<b>Spring Semester</b>		
<b>Benchmarks</b>	<b>Course/Requirement</b>	<b>Course Name</b>	<b>Hours</b>	<b>Course/Requirement</b>	<b>Course Name</b>	<b>Hours</b>
-Complete Math requirement -Complete at least one science -Complete English 1110.01	FAES 1100	College Survey	.5	CHEM 1110, 1210, or 1220	General Chemistry	5
	HCS 1100	Dept Survey	.5	GE Hist. & Cultural Studies		3
	GE Math	See options	4-5	GE WIL: ENGLISH 1110	First-Year English Comp.	3
	HCS 2204 ❖ <sup>b</sup> & 2205 (or HCS 2201)	Ecology of Managed Plant Systems❖ & Lab	4	HCS 2202	Form and Function in Cultivated Plants	4
	GE Lit, Vis and Perf Arts		3	GENED 1201	GE Launch Seminar	1
	Minor Equiv. Elective		3			
<b>Hours: 31</b>		<b>Total:</b>	<b>15</b>		<b>Total:</b>	<b>16</b>
<b>Sophomore Year</b>	<b>Autumn Semester</b>			<b>Spring Semester</b>		
<b>Benchmarks</b>	<b>Course/Requirement</b>	<b>Course Name</b>	<b>Hours</b>	<b>Course/Requirement</b>	<b>Course Name</b>	<b>Hours</b>
-Declare minor -Complete three science courses by the end of this year -Begin to consider an internship location	HCS 3200 <sup>a</sup>	Intro to Horticulture	3	BIOLOGY 1114	Form, Function, Diversity, and Ecology	4
	GE Nat Sci: BIOLOGY 1113	Energy Transfer and Development	4	HCS 2260	Data Analysis	3
	Major Elective		2-3	HCS 3310	Crop Responses to Environ.	3
	GE R.E. & G. Diversity		3	AGRCOMM 3130	Oral Expression	3
	GE Theme Choice #1 <sup>b</sup>		3-4	GE SBS: AEDECON 2001	Prin. of Food & Res. Econ.	3
<b>Hours: 61</b>		<b>Total:</b>	<b>15</b>		<b>Total:</b>	<b>15</b>
<b>Junior Year</b>	<b>Autumn Semester</b>			<b>Spring Semester</b>		
<b>Benchmarks</b>	<b>Course/Requirement</b>	<b>Course Name</b>	<b>Hours</b>	<b>Course/Requirement</b>	<b>Course Name</b>	<b>Hours</b>
-Apply to graduate -Complete internship by end of the summer -Half of major hours to be completed by the end of the year	GE Theme Choice #2 <sup>b</sup> (or Open Elective)		3	Minor Equiv. Elective		3
	EEOB 3310.01 <sup>a</sup>	Evolution	3	ENR 3000 & 3001	Soil Science & Lab	4
	GE Citizenship #1 <sup>b</sup>		3-4	HCS 3220	Crop Origins and Diversity	2
	Major Elective		3	EEOB 3410	Ecology	3
	GE Citizenship #2 <sup>b</sup> (or Open Elective)		3	HCS 5622 <sup>a</sup>	Biochemical Processes in Cult. Plants	3
<b>Hours: 91</b>		<b>Total:</b>	<b>15</b>		<b>Total:</b>	<b>15</b>
<b>Summer</b>	Conduct Internship (Enroll in FAES 3191)					
<b>Senior Year</b>	<b>Autumn Semester</b>			<b>Spring Semester</b>		
<b>Benchmarks</b>	<b>Course/Requirement</b>	<b>Course Name</b>	<b>Hours</b>	<b>Course/Requirement</b>	<b>Course Name</b>	<b>Hours</b>
-Meet graduation requirements -Meet with a Career Services Advisor	HCS 4191	Internship	2	HCS 5200 <sup>a</sup>	Advanced Horticultural Systems (Capstone)	3
	CHEM 2310	Introductory Organic Chem	4	Major Elective		3-4
	HCS 5325	Plant Genetics	3	Minor Equiv. Elective		3
	Open Elective		2	Minor Equiv. Elective		3-4
	Minor Equiv. Elective		3	Open Elective		2-3
	GENED 4001	GE Reflection	1			
		<b>Total:</b>	<b>15</b>		<b>Total:</b>	<b>15</b>
<b>Total credit hours for Bachelor of Science Degree:</b>						<b>121</b>

<sup>a</sup> One possible course from approved GE list or major requirement that has multiple options, as outlined in corresponding Degree Requirements document.

<sup>b</sup> Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

## 4-Year Completion Checklist

Freshman Year	Autumn Semester			Spring Semester		
<b>Benchmarks</b>	<b>Course/Requirement</b>		✓	<b>Course/Requirement</b>		✓
<input type="checkbox"/> Complete Math requirement	FAES 1100					
	HCS 1100					
<input type="checkbox"/> Complete at least one science						
<input type="checkbox"/> Complete English 1110.01						
<b>Hours:</b> _____	<b>Notes:</b>			<b>Notes:</b>		
Sophomore Year	Autumn Semester			Spring Semester		
<b>Benchmarks</b>	<b>Course/Requirement</b>		✓	<b>Course/Requirement</b>		✓
<input type="checkbox"/> Complete three science courses by the end of this year						
<input type="checkbox"/> Begin to consider an internship location						
<b>Hours:</b> _____	<b>Notes:</b>			<b>Notes:</b>		
Junior Year	Autumn Semester			Spring Semester		
<b>Benchmarks</b>	<b>Course/Requirement</b>		✓	<b>Course/Requirement</b>		✓
<input type="checkbox"/> Apply to graduate						
<input type="checkbox"/> Complete internship by end of the summer						
<input type="checkbox"/> Half of major hours to be completed by the end of the year						
<b>Hours:</b> _____	<b>Notes:</b>			<b>Notes:</b>		
Senior Year	Autumn Semester			Spring Semester		
<b>Benchmarks</b>	<b>Course/Requirement</b>		✓	<b>Course/Requirement</b>		✓
<input type="checkbox"/> Meet graduation requirements						
<input type="checkbox"/> Meet with a Career Services Advisor						
<b>Hours:</b> _____	<b>Notes:</b>			<b>Notes:</b>		

**Total credit hours for Bachelor of Science Degree: 121**

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