

# Agroecology & Sustainable Food Systems (BS): Agroecology Research & Production Concentration

To see more about what you will learn in this program, visit the Learning Outcomes website (<https://apps.oirp.ncsu.edu/pgas/>)!

The Bachelor of Science in Agroecology and Sustainable Food Systems is offered jointly through the Departments of Crop and Soil Sciences and Horticultural Science. This multidisciplinary major offers students diverse courses, hands-on learning, community engagement opportunities, internships, and research experiences to address the grand challenges of agriculture and food systems. Students can choose from three career path concentrations – Agroecology Research and Production, Community Food Systems, and Urban Horticulture.

The Agroecology Research and Production concentration is for students interested in the deeper science of sustainable agriculture production practices, research, and graduate school opportunities in agriculture, entomology, horticulture, soil sciences and related sciences. Students will have the opportunity to learn from a wide diversity of faculty leading cutting edge sustainable agriculture research, many at the Center for Environmental Farming Systems (CEFS), a national recognized sustainable agriculture research, education and extension facility.

Community Food Systems is a broad concentration for students interested in connecting production with issues in the greater food system, such as food security, policy, community education or extension. Students can also participate in social science, agricultural economics, agriculture education research and others with food system with researchers at CEFS and NC State that support this concentration.

The Urban Horticulture concentration integrates horticulture production and agriculture business education for students interested in starting or managing their own sustainable horticultural farm, working with community gardens, and more. There are many focused horticulture classes, research and internship opportunities as well for this concentration.

## Program Highlights:

- Students in our program gain valuable hands-on experience in sustainable and organic production in our hands-on Agroecology Education Farm, a student farm near campus where all the food produced goes back into NC State Dining cafeterias and the food pantry on campus.
- Students interested in Agroecology can also join the Agroecology Student Club at NC State who organize various sustainable agriculture and food system activities each semester.
- As a required part of the curriculum, students will complete either an internship program or research experience to gain practical and professional development experience. Students will have no problems finding an opportunity with the numerous sustainable

agriculture researchers and community stakeholders that collaborate with NC State focused in sustainable agriculture and food systems.

- Seniors will complete a Senior Capstone Project through which they draw on both their major courses and their concentration to address a problem or issue that they identify.
- Agroecology and Sustainable Food System students have the opportunity to student abroad with the various global food and sustainable agriculture focused study abroad programs in Ireland, Scotland, England, Mexico and others.

For more information about our program, visit our website (<https://cals.ncsu.edu/crop-and-soil-sciences/agroecology-and-sustainable-agriculture/>).

## Contact

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## Plan Requirements

Code	Title	Hours	Counts towards
<b>Orientation</b>			
ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences	1	
or ALS 303	Transfer Transitions and Diversity in Agriculture & Life Sciences		
<b>Mathematics &amp; Natural Sciences</b>			
MA 107	Precalculus I	3	
Select one of the following:			3
MA 121	Elements of Calculus		
MA 131	Calculus for Life and Management Sciences A		
MA 141	Calculus I		
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4	
BIO 183	Introductory Biology: Cellular and Molecular Biology	4	
or PB 200	Plant Life		
CH 101	Chemistry - A Molecular Science	3	
CH 102	General Chemistry Laboratory	1	
AEC 360	Ecology	4	

**Communication/Advanced Writing**

COM 110	Public Speaking	3
or COM 112	Interpersonal Communication	
Select one of the following:		3
AEE 311	Communication Methods and Media	
ENG 331	Communication for Engineering and Technology	
ENG 332	Communication for Business and Management	
ENG 333	Communication for Science and Research	
<b>Major Requirements</b>		
CS 230	Introduction to Agroecology	3
CS 415	Integrated Pest Management	3
CS 430	Advanced Agroecology	4
HS 410	Community Food Systems	3
HS 480	Sustainable Food Production (capstone)	1
ARE 201	Introduction to Agricultural & Resource Economics	3
SSC 200	Soil Science	3
SSC 201	Soil Science Laboratory	1
STS 323	World Population and Food Prospects	3
SSC 427	Biological Approaches to Sustainable Soil Systems	3
or SSC 332	Environmental Soil Microbiology	
SOC 241	Sociology of Agriculture and Rural Society	3
SSC 428	Service-Learning in Urban Agriculture Systems	1
Select one of the following:		3
IDS 201	Environmental Ethics	
IDS 211	Eating through American History	

IDS 303 Humans and the Environment

Select one of the following:		3
CSSC 492	Professional Internship Experience in Crop and Soil Sciences	
CSSC 493	Research Experience in Crop and Soil Sciences	
HS 492	Horticulture Internship	
HS 493	Research Experience in Horticultural Science	
CSSC 290	Professional Development in Crop & Soil Sciences	1

**Concentration Electives**

Foundational Electives (p. 3)	11
Restricted Electives (p. 3)	21

**GEP Courses**

ENG 101	Academic Writing and Research <sup>1</sup>	4
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )		6
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )		2
GEP Additional Breadth ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> ) (Humanities/Social Sciences/Visual and Performing Arts)		3
GEP U.S. Diversity ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/</a> ) (verify requirement)		
GEP Global Knowledge ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/</a> ) (verify requirement)		
Foreign Language Proficiency ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/</a> ) (verify requirement)		

**Free Electives**

Free Electives (12 Hr S/U Lmt)	6
<b>Total Hours</b>	<b>120</b>

<sup>1</sup> A grade of C- or higher is required.

<sup>2</sup> Students should consult their academic advisors to determine which courses fill this requirement.

## Foundational Electives

Code	Title	Hours	Counts towards
<b>Group I (Max: 4 Units)</b>			
CH 220	Introductory Organic Chemistry	3	
CH 221	Organic Chemistry I	3	
CH 222	Organic Chemistry I Lab	1	
<b>Group II (Max: 4 Units)</b>			
CS 213	Crop Science	3	
HS 431	Vegetable Production	4	
<b>Group III (Max: 4 Units)</b>			
PY 131	Conceptual Physics	4	
PY 211	College Physics I	4	
ST 311	Introduction to Statistics	3	

## Restricted Electives

Code	Title	Hours	Counts towards
<b>300+ Level Electives</b>			
AEC 380	Water Resources: Global Issues in Ecology, Policy, Management, and Advocacy	3	
AEC 400	Applied Ecology	3	
ANS 408	Small Ruminant Management	3	
CS 312	Grassland Management for Natural Resources Conservation	3	
CS 411	Crop Ecology	3	
ENT 425	General Entomology	3	
ENT 526	Organic Agriculture: Principles and Practices	3	
ES 300	Energy and Environment	3	
FS 462	Postharvest Physiology	3	

FS 520	Pre-Harvest Food Safety	3
FS 530	Post-Harvest Food Safety	3
FS 562	Postharvest Physiology	3
FSA 520	Pre-Harvest Food Safety	3
FSA 530	Post-Harvest Food Safety	3
HS 431	Vegetable Production	4
HS 432	Introduction to Permaculture	3
HS 451	Plant Nutrition	3
HS 462	Postharvest Physiology	3
HS 532	Introduction to Permaculture	3
HS 551	Plant Nutrition	3
HS 562	Postharvest Physiology	3
PB 321	Introduction to Whole Plant Physiology	3
PB 345	Economic Botany	3
PB 346	Economic Botany Lab	1
SSC 341	Soil Fertility and Nutrient Management	3
SSC 342	Soil and Plant Nutrient Analysis	1
SSC 461	Soil Physical Properties and Plant Growth	3
SSC 462	Soil-Crop Management Systems	3
FOR 318	Forest Pathology	3
PP 315	Principles of Plant Pathology	4
or PP 318	Forest Pathology	

## Semester Sequence

### First Year

Fall Semester	Hours	
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
ALS 103 or ALS 303	Freshman Transitions and Diversity in Agriculture & Life Sciences or Transfer Transitions and Diversity in Agriculture & Life Sciences	1
ENG 101	Academic Writing and Research	4
MA 107	Precalculus I	3

Foundation Elective (p. )		3
<b>Hours</b>		<b>15</b>
<b>Spring Semester</b>		
BIO 183 or PB 200	Introductory Biology: Cellular and Molecular Biology or Plant Life	4
Select one of the following:		3-4
MA 121	Elements of Calculus	
MA 131	Calculus for Life and Management Sciences A	
MA 141	Calculus I	
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )		3
COM 110 or COM 112	Public Speaking or Interpersonal Communication	3
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )		1
<b>Hours</b>		<b>14</b>
<b>Second Year</b>		
<b>Fall Semester</b>		
CSSC 290	Professional Development in Crop & Soil Sciences	1
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
CS 230	Introduction to Agroecology	3
Select one of the following:		3
IDS 201	Environmental Ethics	
IDS 211	Eating through American History	
IDS 303	Humans and the Environment	
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )		3
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )		1
<b>Hours</b>		<b>15</b>
<b>Spring Semester</b>		
ARE 201	Introduction to Agricultural & Resource Economics	3
AEC/PB 360	Ecology	4
SSC 200	Soil Science	3
SSC 201	Soil Science Laboratory	1
Foundation Elective (p. )		4
<b>Hours</b>		<b>15</b>
<b>Third Year</b>		
<b>Fall Semester</b>		
SOC 241	Sociology of Agriculture and Rural Society	3
SSC 427 or SSC 332	Biological Approaches to Sustainable Soil Systems or Environmental Soil Microbiology	3
CS/HS 410	Community Food Systems	3
Foundation Elective (p. )		4
Select one of the following:		3

ENG 331	Communication for Engineering and Technology	
ENG 332	Communication for Business and Management	
ENG 333	Communication for Science and Research	
AEE 311	Communication Methods and Media	
<b>Hours</b>		<b>16</b>
<b>Spring Semester</b>		
CS 430	Advanced Agroecology	4
SSC/HS 428	Service-Learning in Urban Agriculture Systems	1
STS 323	World Population and Food Prospects	3
Restricted Elective (p. 3)		3
Restricted Elective (p. 3)		3
<b>Hours</b>		<b>14</b>
<b>Fourth Year</b>		
<b>Fall Semester</b>		
CS/HS 480	Sustainable Food Production (capstone)	1
Restricted Elective (p. 3)		3
Restricted Elective (p. 3)		3
Restricted Elective (p. 3)		3
CSSC 492 or CSSC 493	Professional Internship Experience in Crop and Soil Sciences or Research Experience in Crop and Soil Sciences	3
Free Elective		3
<b>Hours</b>		<b>16</b>
<b>Spring Semester</b>		
CS 415	Integrated Pest Management	3
GEP Additional Breadth ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> )		3
Restricted Elective (p. 3)		3
Restricted Elective (p. 3)		3
Free Elective		3
<b>Hours</b>		<b>15</b>
<b>Total Hours</b>		<b>120</b>

## Career Opportunities

Interested in the deeper science of sustainable agriculture production, research, and graduate school opportunities in agriculture, entomology, horticulture, soil sciences and related sciences? Then Agroecology Research and Production is for you. Career tracks include:

- Agriculture and environmental science research
- Farm management
- Governmental (USDA, NRCS, EPA) research and education
- International agricultural work
- Plant Breeder
- Weed Ecologist
- Environmental Scientist
- Ecologist
- Conservationist
- Community Garden Director

- Agriculture policy and education specialist
- Farmer/farm worker advocacy professional