

# 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 (<http://catalog.ncsu.edu/undergraduate/agriculture-life-sciences/crop-soil-sciences/agroecology-sustainable-food-systems-bs-community-food-systems-concentration/>) 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 (<http://catalog.ncsu.edu/undergraduate/agriculture-life-sciences/horticultural-science/agroecology-sustainable-food-systems-bs-urban-horticulture-concentration/>) 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.

## Contact Person

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

## 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		
CSSC 290	Professional Development in Crop & Soil Sciences	1	
<b>Mathematics &amp; Natural Sciences</b>			
MA 121	Elements of Calculus	3	
or MA 131	Calculus for Life and Management Sciences A		
ST 311	Introduction to Statistics	3	
AEC 360	Ecology	4	
or PB 360	Ecology		
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
PY 131	Conceptual Physics	4

**Advanced Chemistry**

Select one of the following:		4
CH 201 & CH 202	Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory	
CH 220 & CH 222	Introductory Organic Chemistry and Organic Chemistry I Lab	

**Communication/Advanced Writing**

COM 110 or COM 112	Public Speaking Interpersonal Communication	3
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	

**Major Requirements**

ARE 201	Introduction to Agricultural & Resource Economics	3
CS 230	Introduction to Agroecology <sup>1</sup>	3
CS 415	Integrated Pest Management	3
CS 430	Advanced Agroecology	4
HS/CS 410	Community Food Systems	3

HS/CS 480	Sustainable Food Production (capstone)	1
SSC 200	Soil Science <sup>1</sup>	3
SSC 201	Soil Science Laboratory	1
STS 323	World Population and Food Prospects	3
SSC 427	Biological Approaches to Sustainable Soil Systems	3
SSC 428	Service-Learning in Urban Agriculture Systems	1

**Experiential Learning**

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	
ALS 494	International Learning Experience in Agriculture and Life Sciences	
HS 494	Teaching Experience in Horticultural Science	

**Concentration Electives**

Foundational Elective	3
Agricultural Sciences Electives	6
Advanced Agricultural Sciences Elective	9
Socio-Economic and Food System Electives	6
Advanced Socio-Economic and Food System Electives	3

**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 Social Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/</a> )	3
GEP US Diversity, Equity, and Inclusion ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/</a> )	3
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)	
<b>Free Electives</b>	
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
CS 224	Seeds, Biotechnology and Societies	3	
ES 200	Climate Change and Sustainability	3	
FW 221	Conservation of Natural Resources	3	
IDS 203	Humans and the Environment	3	
SSC 185	Land and Life	3	

## Agricultural Sciences

Code	Title	Hours	Counts towards
AEC 203	An Introduction to the Honey Bee and Beekeeping	3	
CS 213	Crop Science	3	
CS 214	Crop Science Laboratory	1	
CS 216	Southern Row Crop Production - Cotton, Peanuts, and Tobacco	3	

CS 218	Southern Row Crop Production - Corn, Small Grains and Soybeans	3
CS 251	Production of Forage Crops	3
CS 411	Crop Ecology	3
CS 424	Seed Physiology	3
ENT 425	General Entomology	3
PB 215	Medicinal Plants	3
PB 250	Plant Biology	4
PP 315	Principles of Plant Pathology	4

## Advanced Agricultural Sciences Electives

Code	Title	Hours	Counts towards
AEC 400	Applied Ecology	3	
ANS 215	Agricultural Genetics	3	
CS 211	Plant Genetics	3	
CS 411	Crop Ecology	3	
ENT 401	Honey Bee Biology and Management	3	
ENT 526	Organic Agriculture: Principles and Practices	3	
HS 431	Vegetable Production	4	
HS 432	Introduction to Permaculture	3	
HS 451	Plant Nutrition	3	
HS 462	Postharvest Physiology	3	
HS 476	Crop Physiology and Production in Controlled Environments	3	
PB 321	Introduction to Whole Plant Physiology	3	
PB 345	Economic Botany	3	
PB 346	Economic Botany Lab	1	
PB 450	Plant Ecology	3	
SSC 332	Environmental Soil Microbiology	3	
SSC 341	Soil Fertility and Nutrient Management	3	
SSC 342	Soil and Plant Nutrient Analysis	1	

SSC 455	Soils, Environmental Quality and Global Challenges	3
SSC 461	Soil Physical Properties and Plant Growth	3

## Socio-Economic and Food System Electives

Code	Title	Hours	Counts towards
ARE 215	Small Business Accounting	3	
ARE 270	Principles of Agribusiness Entrepreneurship	3	
ARE 303	Farm Management	3	
ARE 304	Agribusiness Management	3	
ARE 306	Agricultural Law	3	
ARE 309	Environmental Law & Economic Policy	3	
ARE 311	Agricultural Markets	3	
FS/NTR 301	Introduction to Human Nutrition	3	
IDS 211	Eating through American History	3	
NTR 210	Introduction to Community Food Security	3	
NTR 310	Food Insecurity and Federal Nutrition Programs	3	
NTR 330	Public Health Nutrition	3	

## Advanced Socio-Economic and Food System Electives

Code	Title	Hours	Counts towards
AEC 470	Urban Ecology	3	
ARE 433	U.S. Agricultural Policy	3	
ARE 448	International Agricultural Trade	3	
IDS 303	Humans and the Environment	3	
NTR 330	Public Health Nutrition	3	
PRT 430	Tourism, Poverty, and Health	3	
SOC 311	Community Relationships	3	

SOC 342	International Development	3
SOC 350	Food and Society	3

## Semester Sequence

### First Year

Fall Semester	Hours	
ALS 103 or ALS 303	Freshman Transitions and Diversity in Agriculture & Life Sciences or Transfer Transitions and Diversity in Agriculture & Life Sciences	1
CSSC 290	Professional Development in Crop & Soil Sciences	1
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
ENG 101	Academic Writing and Research	4
MA 121 or MA 131	Elements of Calculus or Calculus for Life and Management Sciences A	3
Foundation Elective (p. )		3
<b>Hours</b>		<b>16</b>

### Spring Semester

BIO 183 or PB 200	Introductory Biology: Cellular and Molecular Biology or Plant Life	4
COM 110 or COM 112	Public Speaking or Interpersonal Communication	3
ST 311	Introduction to Statistics	3
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>14</b>

### Second Year

#### Fall Semester

CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
CS 230	Introduction to Agroecology	3
Agricultural Sciences Elective		3
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>14</b>

#### Spring Semester

ARE 201	Introduction to Agricultural & Resource Economics	3
AEC/PB 360	Ecology	4
SSC 200	Soil Science	3
SSC 201	Soil Science Laboratory	1
Agricultural Sciences Elective		3
<b>Hours</b>		<b>14</b>

**Third Year**
**Fall Semester**

SSC 427	Biological Approaches to Sustainable Soil Systems	3
SSC 428	Service-Learning in Urban Agriculture Systems	1
CS/HS 410	Community Food Systems	3
Select one of the following:		4
CH 201 & CH 202	Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory	
CH 220 & CH 222	Introductory Organic Chemistry and Organic Chemistry I Lab	
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	

**Hours 14**

**Spring Semester**

CS 430	Advanced Agroecology	4
STS 323	World Population and Food Prospects	3
Advanced Agricultural Sciences Elective		3
Advanced Agricultural Sciences Elective		3
Socio-Economic and Food Systems Elective		3

**Hours 16**

**Fourth Year**
**Fall Semester**

CS/HS 480	Sustainable Food Production (capstone)	1
PY 131	Conceptual Physics	4
Advanced Agricultural Sciences Elective		3
Socio-Economic and Food Systems Elective		3
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	
ALS 494	International Learning Experience in Agriculture and Life Sciences	

GEP Social Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/</a> )	3
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**Hours 17**

**Spring Semester**

CS 415	Integrated Pest Management	3
GEP US Diversity, Equity, and Inclusion ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/</a> )		3
Advanced Socio-Economic and Food Systems Elective		3
Free Electives		6

**Hours 15**

**Total Hours 120**

## 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