

# Natural Resources (BS): Soil, Water and Land Use 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 *Natural Resources* degree with a concentration in *Soil, Water, and Land Use* encompasses the study of soil, water, air, minerals, flora, fauna and people. In this degree, students acquire a solid foundation in resource management with a focus on soil properties and surface and groundwater hydrology. Graduates will use their understanding of earth's systems to help policy makers, government agencies, and private land managers make environmentally responsible decisions related to soil, water, and land use.

## Contact Person

Undergraduate Programs Office  
Crop & Soil Sciences Department  
2234 Williams Hall  
Campus Box 7620  
919-515-5820  
cropsoil-undergraduate-office@ncsu.edu

## Plan Requirements

Code	Title	Hours	Counts towards
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### Orientation

ALS 103	Freshman Transitions and Diversity in Agriculture & Life Sciences	1	
or ALS 303	Transfer Transitions and Diversity in Agriculture & Life Sciences		

### Communication/Advanced

#### Writing

COM 110	Public Speaking	3	
or COM 112	Interpersonal Communication		

Select one of the following  
Advanced Writing courses: 3

AEE 311	Communication Methods and Media		
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ENG 331	Communication for Engineering and Technology		
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ENG 332	Communication for Business and Management		
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ENG 333	Communication for Science and Research		
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### Mathematics & Natural Sciences

MA 131	Calculus for Life and Management Sciences A	3
MA 231	Calculus for Life and Management Sciences B	3
ST 311	Introduction to Statistics	3
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
AEC 360	Ecology	4
MEA 101 & MEA 110	Geology I: Physical and Geology I Laboratory	4
PY 131	Conceptual Physics	4

### Required Courses within Major

ARE 201	Introduction to Agricultural & Resource Economics	3
CSSC 290	Professional Development in Crop & Soil Sciences	1
NR 300	Natural Resource Measurements	4
SSC 200 & SSC 201	Soil Science and Soil Science Laboratory <sup>1</sup>	4
SSC 341	Soil Fertility and Nutrient Management	3
SSC 342	Soil and Plant Nutrient Analysis	1
SSC 452	Soil Classification	4
SSC 461	Soil Physical Properties and Plant Growth	3
CSSC 490	Senior Seminar in Crop Science and Soil Science	1

### Concentration Electives

Foundation Elective (select one):		3
ES 150	Water and the Environment	
FW 221	Conservation of Natural Resources	

SSC 185	Land and Life	
Advanced Chemistry Elective (select one):		3
CH 201 & CH 202	Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory	
CH 220 & CH 222	Introductory Organic Chemistry and Organic Chemistry I Lab	
SSC 442	Soil and Environmental Biogeochemistry	
Economics, Management & Policy Electives (p. 2)		6
Experiential Learning (select one):		3
CSSC 492	Professional Internship Experience in Crop and Soil Sciences	
CSSC 493	Research Experience in Crop and Soil Sciences	
Geospatial Technologies Elective (p. 3)		3
Land Use Electives (p. 3)		6
Plant Science Electives (p. 3)		6
Water, Wetlands & Ecology Electives (p. 3)		6
<b>GEP Courses</b>		
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 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 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 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 Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )	2
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)	4
<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.

**Economics, Management & Policy Electives**

Code	Title	Hours	Counts towards
AEC 380	Water Resources: Global Issues in Ecology, Policy, Management, and Advocacy	3	
ARE 215	Small Business Accounting	3	
ARE 306	Agricultural Law	3	
ARE 309	Environmental Law & Economic Policy	3	
ARE 312	Agribusiness Marketing	3	
ARE 332	Human Resource Management for Agribusiness	3	
ARE 336	Introduction to Resource and Environmental Economics	3	
CE 478	Energy and Climate	3	
CS 418	Introduction to Regulatory Science in Agriculture	3	
CS 428	Advanced Regulatory Science in Agriculture	3	

NR 406	Conservation of Biological Diversity	3
NR 460	Renewable Natural Resource Management and Policy	3
PS 201	American Politics and Government	3
PS 202	State and Local Government	3
PS 320	U.S. Environmental Law and Politics	3
SSC 455	Soils, Environmental Quality and Global Challenges	3

### Geospatial Technologies Electives

Code	Title	Hours	Counts towards
BAE 325	Introductory Geomatics	3	
FOR 353	GIS and Remote Sensing for Environmental Analysis and Assessment	3	
GIS 280	Introduction to GIS	3	
GIS 512	Introduction to Environmental Remote Sensing	3	
SSC 440/540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3	
SSC 545	Remote Sensing Applications in Soil Science and Agriculture	3	

### Land Use Electives

Code	Title	Hours	Counts towards
MEA 300	Environmental Geology	4	
MEA 481	Geomorphology: Earth's Dynamic Surface	3	
NR 400/500	Natural Resource Management	4	
NR 484	Environmental Impact Assessment	4	
NR 510	Military Land Sustainability	3	

SSC 410	Soil Judging for Land Evaluation	1
SSC 421	Role of Soils in Environmental Management	3
SSC 427	Biological Approaches to Sustainable Soil Systems	3
SSC 455	Soils, Environmental Quality and Global Challenges	3
SSC 462	Soil-Crop Management Systems	3

### Plant Science Electives

Code	Title	Hours	Counts towards
CS 213	Crop Science	3	
CS 230	Introduction to Agroecology	3	
CS 251	Production of Forage Crops	3	
PB 200	Plant Life	4	
FOR 252	Introduction to Forest Science	4	
FOR 339	Dendrology	4	
PB 220	Local Flora	3	
PB 321	Introduction to Whole Plant Physiology	3	
PB 421	Plant Physiology	3	

### Water, Wetlands & Ecology Electives

Code	Title	Hours	Counts towards
AEC 400	Applied Ecology	3	
AEC 419	Freshwater Ecology	4	
BAET 323	Water Management	3	
FOR 260	Forest Ecology	4	
NR/FOR 420	Watershed and Wetlands Hydrology	4	
NR 421/521	Wetland Science and Management	3	
SSC 332	Environmental Soil Microbiology	3	
SSC 470/570	Wetland Soils	3	

### Semester Sequence

This is a sample.

**First Year**

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

**Spring Semester**

CH 101	Chemistry - A Molecular Science	3
CH 102	General Chemistry Laboratory	1
MA 231	Calculus for Life and Management Sciences B	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
AEC 360	Ecology	4
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>

**Second Year****Fall Semester**

ARE 201	Introduction to Agricultural & Resource Economics	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
SSC 200	Soil Science	3
SSC 201	Soil Science Laboratory	1
ST 311	Introduction to Statistics	3
Plant Science Elective (p. 3)		3
COM 110 or COM 112	Public Speaking or Interpersonal Communication	3
<b>Hours</b>		<b>17</b>

**Spring Semester**

MEA 101	Geology I: Physical	3
MEA 110	Geology I Laboratory	1
PY 131	Conceptual Physics	4
SSC 341	Soil Fertility and Nutrient Management	3
Economics, Management and Policy Elective (p. 2)		3
GEP Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )		2
<b>Hours</b>		<b>16</b>

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

SSC 342	Soil and Plant Nutrient Analysis	1
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SSC 461	Soil Physical Properties and Plant Growth	3
Advanced Chemistry Elective (p. 1)		3
Land Use Elective (p. 3)		3
Economics, Management and Policy Elective (p. 2)		3

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**Hours** **13**

**Spring Semester**

NR 300	Natural Resource Measurements	4
SSC 452	Soil Classification	4
Geospatial Technologies Elective (p. 3)		3
Water, Wetlands, and Ecology Elective (p. 3)		3

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**Hours** **14**

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

Experiential Learning Elective (p. 1)		3
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	

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 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 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** **15**

**Spring Semester**

Free Elective		4
CSSC 490	Senior Seminar in Crop Science and Soil Science	1
Land Use Elective (p. 3)		3
Water, Wetlands, and Ecology Elective (p. 3)		3
Plant Science Elective (p. 3)		3

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**Hours** **14**

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**Total Hours** **120**

**Career Opportunities**

The breadth and depth of education and experiences you will gain from our department will set you on a path toward a rewarding career in one of the following specialties:

- Conservationist
- Ecologist
- Environmental Scientist and Specialist
- Extension Agent
- Hydrologist
- Nutrient Management/ Waste Management Specialist
- Precision Agriculture Specialist
- Restoration Specialist
- Soil Scientist

Learn more about future job prospects, representative salaries, and major employers for each of the above listed careers at [go.ncsu.edu/careers](http://go.ncsu.edu/careers) (<http://go.ncsu.edu/careers/>)