

# Horticultural Science (BS): Production Systems and Entrepreneurship in Horticulture Concentration

The Bachelor of Science in Horticultural Science: Production Systems and Entrepreneurship in Horticulture Concentration is one of the four concentrations offered in by the Department of Horticultural Science. Students are offered a unique look at various aspects of Horticulture.

The Production Systems and Entrepreneurship in Horticulture Concentration concentration is a menu driven concentration that allows students to direct their education in either ornamental or edible plant production. Students are required to take two Biology courses, Soil Science, General Chemistry, Introduction to Organic Chemistry, Whole Plant Physiology, and a lower level Genetics. The remaining courses for the major are selected from a series of topical menus: Plant Protection Electives, Business Electives, and Advised Electives.

Students can follow paths toward nursery or greenhouse operations, vegetable or fruit production, and entrepreneurship or pursue a graduate degree.

## Coordinator

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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>Communication</b>		<b>3</b>	
COM 110	Public Speaking		
or COM 112	Interpersonal Communication		
or COM 202	Small Group Communication		
<b>Mathematics &amp; Sciences</b>			
MA 107	Precalculus I	3	

And one of the following:

MA 114	Introduction to Finite Mathematics with Applications	3	
or MA 121	Elements of Calculus		
or MA 131	Calculus for Life and Management Sciences A		
or ST 311	Introduction to Statistics		
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	
CH 220	Introductory Organic Chemistry	3	
CH 222	Organic Chemistry I Lab	1	
or PY 131	Conceptual Physics		
ARE 201	Introduction to Agricultural & Resource Economics	3	
or EC 201	Principles of Microeconomics		
or EC 205	Fundamentals of Economics		
<b>Foundational Courses</b>			
HS 201	The World of Horticulture: Principles and Practices	3	
HS 290	Horticulture: Careers and Opportunities	1	
ANS/HS 215	Agricultural Genetics	3	
or CS 211	Plant Genetics		
SSC 200	Soil Science	3	
SSC 201	Soil Science Laboratory	1	
HS 301	Plant Propagation	4	
PB 321	Introduction to Whole Plant Physiology	3	
HS 451	Plant Nutrition	3	
AEC 360	Ecology	4	
or PB 360	Ecology		

Select one of the following Career Experience courses:	3
HS 492 Horticulture Internship	
or HS 493 Research Experience in Horticultural Science	
or HS 494 Teaching Experience in Horticultural Science	

**Electives**

Environmental Elective (p. )	3
Plant Protective Elective (p. 2)	6
Business Electives (must choose at least one Entrepreneurship and one Management Elective) (p. 2)	9
Broad-Scope Electives (p. )	3
Advised Electives (p. 3) <sup>3</sup>	16

**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 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 Elective ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</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)	
World Language Proficiency ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/</a> ) (verify requirement)	

**Free Electives**

Free Electives (12 Hr S/U Lmt) <sup>2</sup>	6
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**Total Hours** **120**

<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.

<sup>3</sup> 19 credits minimum; At least 3 credits from Broad Scope; Remaining 16 credits from can be from Broad-Scope, Ornamental, or Edible Plant Electives

**Environmental Electives**

Code	Title	Hours	Counts towards
AEC 380	Water Resources: Global Issues in Ecology, Policy, Management, and Advocacy	3	
or CS 224	Seeds, Biotechnology and Societies		
or ES 200	Climate Change and Sustainability		
or IDS 201	Environmental Ethics		

**Plant Protective Electives**

Code	Title	Hours	Counts towards
CS 414	Weed Science	4	
CS 415	Integrated Pest Management	3	
ENT 425	General Entomology	3	
or FOR 402	Forest Entomology		
PP 315	Principles of Plant Pathology	4	
or FOR 318	Forest Pathology		
or PP 318	Forest Pathology		

**Business Electives**

Code	Title	Hours	Counts towards
<b>Entrepreneurship Electives</b>			
ACC 280	Survey of Financial and Managerial Accounting	3	
ARE 215	Small Business Accounting	3	
ARE 321	Agricultural Financial Management	3	
BUS 370	Operations and Supply Chain Management	3	
MIE 201	Introduction to Business Processes	3	
MIE 310	Introduction to Entrepreneurship	3	
MIE 413	New Venture Planning	3	
<b>Management Electives</b>			
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
ARE 312	Agribusiness Marketing	3
ARE 332	Human Resource Management for Agribusiness	3
BUS 360	Marketing Methods	3

**Broad-Scope Electives**

Code	Title	Hours	Counts towards
AEC 203	An Introduction to the Honey Bee and Beekeeping	3	
ENT 401	Honey Bee Biology and Management	3	
HS 242	Introduction to Small Scale Landscape Design	3	
HS 280	Hands-On-Horticulture	3	
HS 440	Greenhouse Management	3	
HS 471	Landscape Ecosystem Management	4	
HS 476	Crop Physiology and Production in Controlled Environments	3	
HS 491	Sustainable Agriculture Entrepreneurship Study Abroad	3	
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	

**Advised Electives**

Code	Title	Hours	Counts towards
<b>Ornamental Plant Electives</b>			
CS 200	Introduction to Turfgrass Management	4	
HS 302	Gardening with Herbaceous Perennials	3	
HS 303	Ornamental Plant Identification I	3	
HS 304	Ornamental Plant Identification II	3	
HS 411	Nursery Management	3	
HS 442	Floriculture Crop Production	3	
PB 220	Local Flora	3	
<b>Edible Plant Electives</b>			
BAE 435	Precision Agriculture Technology	3	
CS 230	Introduction to Agroecology	3	
CS 430	Advanced Agroecology	4	
FS 250	Basics of Food Safety & Quality	3	
FS 462	Postharvest Physiology	3	
HS 421	Temperate-Zone Tree Fruits: Physiology and Culture	3	
HS 422	Small Fruit Production	3	
HS 431	Vegetable Production	4	
HS 462	Postharvest Physiology	3	
PB 215	Medicinal Plants	3	
PB 325	Culinary Botany	3	
PB 345	Economic Botany	3	
PB 346	Economic Botany Lab	1	

**Semester Sequence**

This is a sample.

**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

BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
ENG 101	Academic Writing and Research	4
HS 201	The World of Horticulture: Principles and Practices	3
HS 290	Horticulture: Careers and Opportunities	1
MA 107	Precalculus I	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 or COM 202	Public Speaking or Interpersonal Communication or Small Group Communication	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
MA 114 or MA 121 or MA 131 or ST 311	Introduction to Finite Mathematics with Applications or Elements of Calculus or Calculus for Life and Management Sciences A or Introduction to Statistics	3
<b>Hours</b>		<b>14</b>

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

Advised Elective (p. 3) <sup>1</sup>		3
Environmental Elective (p. )		3
ANS/HS 215 or CS 211	Agricultural Genetics or Plant Genetics	3
CH 101	Chemistry - A Molecular Science	3
CH 102	General Chemistry Laboratory	1
<b>Hours</b>		<b>13</b>

**Spring Semester**

Advised Elective (p. 3)		3
ARE 201 or EC 201 or EC 205	Introduction to Agricultural & Resource Economics or Principles of Microeconomics or Fundamentals of Economics	3
CH 220	Introductory Organic Chemistry	3
CH 222 or PY 131	Organic Chemistry I Lab or Conceptual Physics	1
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
<b>Hours</b>		<b>15</b>

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

Advised Elective (p. 3)		3
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GEP Elective ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> )		3
HS 301	Plant Propagation	4
HS 492 or HS 493 or HS 494	Horticulture Internship (Select one of the following:) or Research Experience in Horticultural Science or Teaching Experience in Horticultural Science	3

Plant Protection Elective (p. 2)		3
<b>Hours</b>		<b>16</b>

**Spring Semester**

Advised Elective (p. 3)		3
ARE/BUS Elective (p. 2)		3
HS 451	Plant Nutrition	3
PB 321	Introduction to Whole Plant Physiology	3
Plant Protection Elective (p. 2)		3
<b>Hours</b>		<b>15</b>

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

Advised Elective (p. 3)		3
ARE/BUS Elective (p. 2)		3
Free Elective		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
PB/AEC 360	Ecology	4
<b>Hours</b>		<b>16</b>

**Spring Semester**

Advised Elective (p. 3)		3
ARE/BUS Elective (p. 2)		3
Free 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 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> )		3
<b>Hours</b>		<b>15</b>

**Total Hours****120**

## Career Opportunities

Horticulture graduates fill positions in production, processing, sales, service, and outreach. Among these are:

- County extension agents
- Vocational agriculture teachers
- Plant breeders
- Landscape designers and landscape contractors
- Floral crop grower or floral designer
- Fruit and vegetable growers
- Business owners
- Orchard, nursery, greenhouse, and garden center managers
- Research, production, and promotional specialists with commercial seed, fertilizer chemical, and food companies
- Urban horticulture specialists

- Garden writers
- Quality control technologists
- USDA specialists
- County and state government planners
- Leaders in other phases of agricultural and industrial developments
- Students also prepare for careers in research, teaching or extension in horticulture

## Career Titles

- Agricultural Engineer
- Agricultural Inspector
- Agricultural Sciences Professor
- Agricultural Technician
- Botanist
- Crop Workers Supervisor
- Farm and Ranch Manager
- Farm Management Advisor
- Farm Products Purchasing Agent
- Farmers and Ranchers
- Food & Drug Inspector
- Food Science Technicians
- Golf Course Manager
- Greenhouse and Nursery Manager
- Horticultural Worker Supervisor
- Horticulture Therapist
- Horticulturist
- Irrigation Engineer
- Landscape Architect
- Landscape Contractor
- Plant Breeder
- Sales Representative (Agricultural Products)
- Winemaker / Vinter

## Learn More About Careers

NCcareers.org (<https://nccareers.org/>)

Explore North Carolina's central online resource for students, parents, educators, job seekers and career counselors looking for high quality job and career information.

Occupational Outlook Handbook (<https://www.bls.gov/ooh/>)

Browse the Occupational Outlook Handbook published by the Bureau of Labor Statistics to view state and area employment and wage statistics. You can also identify and compare similar occupations based on your interests.

Career One Stop Videos (<https://www.careeronestop.org/>)

View videos that provide career details and information on wages, employment trends, skills needed, and more for any occupation. Sponsored by the U.S. Department of Labor.

Focus 2 Career Assessment (<https://careers.dasa.ncsu.edu/explore-careers/career-assessments/>) (NC State student email address required)

This career, major and education planning system is available to current NC State students to learn about how your values, interests, competencies, and personality fit into the NC State majors and your future career. An NC State email address is required to create an

account. Make an appointment with your career counselor (<https://careers.dasa.ncsu.edu/about/hours-appointments/>) to discuss the results.

Focus 2 Apply Assessment (<https://www.focus2career.com/Portal/Register.cfm?SID=1929>) (Available to prospective students)

A career assessment tool designed to support prospective students in exploring and choosing the right major and career path based on your unique personality, interests, skills and values. Get started with Focus 2 Apply and see how it can guide your journey at NC State.