

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 |
|-----------------------------------|--|----------|
| Orientation | | |
| ALS 103 | First-year Success in Agriculture and Life Sciences | 1 |
| or ALS 303 | Transfer Success in Agriculture and Life Sciences | |
| Communication | | 3 |
| COM 110 | Public Speaking | |
| or COM 112 | Interpersonal Communication | |
| or COM 202 | Small Group Communication | |
| Mathematics & Sciences | | |
| 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 | |

Foundational Courses

| | | |
|--|---|---|
| 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. 2) ³ | 16 |

GEP Courses

| | | |
|--|--|---|
| ENG 101 | Academic Writing and Research ¹ | 4 |
| GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | | 6 |
| GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/) | | 3 |
| GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) | | 2 |
| GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | | 3 |
| GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) | | 2 |
| GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement) | | |

GEP Foundations of American Democracy (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-fad/>) (verify requirement)

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

Free Electives

Free Electives (12 Hr S/U Lmt) ² 6

Total Hours 120

¹ A grade of C- or higher is required.

² Students should consult their academic advisors to determine which courses fill this requirement.

³ 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 |
|------------|---|-------|
| 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 |
|------------|-------------------------------|-------|
| 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 |
|-----------------------------------|---|-------|
| Entrepreneurship Electives | | |
| 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 | 3 |
| MIE 310 | Introduction to Entrepreneurship | 3 |
| MIE 413 | New Venture Planning | 3 |
| Management Electives | | |
| 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 |

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| ARE 332 | Human Resource Management for Agribusiness | 3 |
| BUS 360 | Marketing Methods | 3 |

Broad-Scope Electives

| Code | Title | Hours |
|---------|---|-------|
| AEC 203 | An Introduction to the Honey Bee and Beekeeping | 3 |
| ENT 401 | Honey Bee Biology and Management | 3 |
| HS 242 | Landscape Design Introduction | 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 |
|-----------------------------------|--------------------------------------|-------|
| Ornamental Plant Electives | | |
| 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 |

Edible Plant Electives

| | | |
|---------|--|---|
| 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 | First-year Success in Agriculture and Life Sciences or Transfer Success in Agriculture and 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 |
| Hours | | 16 |

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 (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | | 3 |
| GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) | | 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 |
| Hours | | 14 |

Second Year**Fall Semester**

| | | |
|--------------------------------------|--|-----------|
| Advised Elective (p. 2) ¹ | | 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 |
| Hours | | 13 |

Spring Semester

| | | |
|---|--|---|
| Advised Elective (p. 2) | | 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 (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) | | 1 |
| SSC 200 | Soil Science | 3 |

| | | |
|--------------|-------------------------|-----------|
| SSC 201 | Soil Science Laboratory | 1 |
| Hours | | 15 |

Third Year**Fall Semester**

| | | |
|--|--|-----------|
| Advised Elective (p. 2) | | 3 |
| GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | | 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 |
| Hours | | 16 |

Spring Semester

| | | |
|----------------------------------|--|-----------|
| Advised Elective (p. 2) | | 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 |
| Hours | | 15 |

Fourth Year**Fall Semester**

| | | |
|---|---------|-----------|
| Advised Elective (p. 2) | | 3 |
| ARE/BUS Elective (p. 2) | | 3 |
| Free Elective | | 3 |
| GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/) | | 3 |
| PB/AEC 360 | Ecology | 4 |
| Hours | | 16 |

Spring Semester

| | | |
|--|--|------------|
| Advised Elective (p. 2) | | 3 |
| ARE/BUS Elective (p. 2) | | 3 |
| Free Elective | | 3 |
| GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | | 3 |
| GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) | | 3 |
| Hours | | 15 |
| 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 / Vintner

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.