

# DEPARTMENT OF PLANT SCIENCES

<http://plantsciences.utk.edu/>

G. Neil Rhodes, Head

## Professors

Albrecht, M.L. (Associate Dean), PhD	Ohio State
Allen, F.L., PhD	Minnesota
Augé, R.M., PhD	Washington State
Bates, G.E., PhD	Georgia
Denton, H.P., PhD	North Carolina State
Deyton, D.E., PhD	North Carolina State
Hayes, R.M., PhD	Illinois
Lockwood, D.W., PhD	Purdue
McDaniel, G.L., PhD	Iowa State
Miller, R.D., PhD	Kentucky
Mueller, T.C., PhD	Georgia
Rhodes, G.N., PhD	North Carolina State
Samples, T.J., PhD	Oklahoma State
Sams, C.E. (Austin Distinguished Professor), PhD	Michigan State
Stewart, C.N. (Racheff Chair), PhD	Virginia Tech
West, D.R., PhD	Nebraska

## Associate Professors

Cheng, Z.M., PhD	Cornell
Gwathmay, C.O., PhD	California (Riverside)
Hamilton, S.L., EdD	Tennessee
Klingeman, W.E., PhD	Georgia
Menendez, G.L., MS	Tennessee
Pantalone, V.R., PhD	North Carolina State
Robinson, D.K., PhD	North Carolina State
Rogers, S.M., MLA	Georgia
Stewart, C.E., MLA	Georgia

## Assistant Professors

Bailey, W.A., PhD	Virginia Tech
Chen, F., PhD	California (Davis)
Kopsell, D.A., PhD	Georgia
McElroy, J.S., PhD	North Carolina State
Sorochan, J.C., PhD	Michigan State
Steckel, L.E., PhD	Illinois
Thompson, M.A., PhD	Tennessee
Zale, J.M., PhD	Saskatchewan (Canada)

## Instructors

Flanagan, P.C., MS	Tennessee
Osburn, L.D., MS	Tennessee

## Adjunct Faculty

Airhart, D.L., PhD	Georgia
Ott, R.J., MBA	Tennessee
Pepin, T. MS	Tennessee

## Emeriti Faculty

Coffey, D.L., PhD	Purdue
Reich, V. H., PhD	Iowa State

## Advisors

Hamilton, McDaniel, Menendez, Rogers, Sorochan, C. Stewart

Academic programs in the Department of Plant Sciences span the art, science and technology of plant use in society. Students receive preparation for careers in horticulture and agronomy within four concentrations – landscape design and construction; plant science, biotechnology and horticulture; public horticulture; and turfgrass science and management. With increasing emphasis placed on plants in urban areas, extensive training in landscape horticulture (planning, implementation and management for landscapes, turf and gardens) is offered. Comprehensive programs in plant biotechnology and plant production are also offered.

Upon entering the department, each student is assigned a faculty advisor for guidance in selection of career specialties and elective courses. The curriculum builds upon the University General Education Requirement with critical courses in botany, soils, and business and adds a set of required departmental courses specific to each concentration. Students are able to customize their program by selecting electives. Students in all concentrations are trained to work knowledgeably in general plant culture.

Students are encouraged to earn a minor in a supportive field to further enhance their academic training and professional competitiveness. While firmly grounding students in the knowledge and skills of the plant sciences and arts, our curricula emphasize critical thinking and creative activity. Our students also gain the theoretical education necessary for continuing on for advanced degrees in plant related fields.

Students should declare a concentration early in their undergraduate program and strictly follow the curriculum described for the concentration. Students who transfer into plant sciences from other colleges or programs must meet the same requirements as those entering the department as freshmen.

Internship or undergraduate research participation is required for each concentration. Full-time summer internships are available at selected local, regional, and national companies or institutions. Part-time summer or semester internships and research experiences are available from the Department of Plant Sciences, other university departments and laboratories, and local commercial firms.

Our graduates find employment in a wide variety of professions. In working for others or within their own businesses, graduates of the landscape concentration design residential landscapes, select proper woody and herbaceous plant materials for specific sites, restore native landscapes, specify specialty components dealing with landscape construction (irrigation, lighting, water features), prepare materials lists and cost estimates for landscape installations, and manage landscape crews. Turf majors have career opportunities in the industries involved with lawn management, athletic fields, golf courses, sales, and park and grounds maintenance. The public horticulture concentration prepares students for careers in botanic gardens, zoos and national parks; professional writing, television and radio; urban forestry; teaching; and municipal and university horticulture. Graduates in plant science, biotechnology and horticulture find employment in education, consulting, sales, agricultural extension, and research and development.

## Core Courses

The core courses for the plant sciences concentrations which are required for entry into upper-division courses are as follows.

### LANDSCAPE DESIGN CONCENTRATION

Two courses in English composition (English 101 and 102 or equivalent); Mathematics 113 or 123 or 151 or equivalent; Computer Sciences 100 or 102 or equivalent; general chemistry (Chemistry 100 or 120 or equivalent); two courses in general botany (Biology 111 and 112 or equivalent); soil science (Environmental and Soil Sciences 210 or equivalent); Basic Landscape Plants (Plant Sciences 220 or equivalent); Fundamentals of Landscape Design (Plant Sciences 280 or equivalent).

### PLANT SCIENCE, BIOTECHNOLOGY AND HORTICULTURE CONCENTRATION

Two courses in English composition (English 101 and 102 or equivalent); two courses in mathematics (Mathematics 123 and 125 or Mathematics 151 and 152 or equivalent); two courses in general chemistry (Chemistry 100 and 110 or 120 and 130 or equivalent); two courses in general botany (Biology 111 and 112 or equivalent); soil science (Environmental and Soil Sciences 210 or equivalent); Computer Applications to Problem Solving (Agriculture and Natural Resources 290 or equivalent).

### PUBLIC HORTICULTURE CONCENTRATION

Two courses in English composition (English 101 and 102 or equivalent); Mathematics 113 or 123 or 151 or equivalent; Computer Sciences 100 or 102 or equivalent; general chemistry (Chemistry 100 or 120 or equivalent); two courses in general botany (Biology 111 and 112 or equivalent); soil science (Environmental and Soil Sciences 210 or equivalent); a plant materials course (Plant Sciences 220 or 230 or 290 or equivalent); Public Horticulture (Plant Sciences 226 or equivalent).

### TURFGRASS SCIENCE AND MANAGEMENT CONCENTRATION

Two courses in English composition (English 101 and 102 or equivalent); two courses in mathematics (Mathematics 123 and 125 or equivalent); two courses in general chemistry (Chemistry 100 and 110 or 120 and 130

or equivalent); two courses in general botany (Biology 111 and 112 or equivalent); soil science (Environmental and Soil Sciences 210 or equivalent); Turfgrass Management (Plant Sciences 240 or equivalent); Computer Applications to Problem Solving (Agriculture and Natural Resources 290 or equivalent).

## Technical Electives

### LANDSCAPE DESIGN AND CONSTRUCTION CONCENTRATION

Architecture 111, 180, 211, 232, 421; Art 101, 103, 191, 295; Art Drawing 211, 212; Art Media Arts 231, 331; Art Painting 213, 214, 215, 216; Biochemistry and Cellular and Molecular Biology 306; Biology 250; Biosystems Engineering Technology 202, 212; Ecology and Evolutionary Biology 304, 330, 433; Communication Studies 230, 310; English 360\*; Entomology and Plant Pathology 201, 306, 313, 321, 410; Environmental and Soil Science 324, 334; Forestry 321; Forestry Wildlife and Fisheries 211, 250, 311; Geography 365, 366; Geology 201, 202, 203; Philosophy 243\*, 244, 245\*; Political Science 402, 403, 446; Spanish 211, 212.

### PLANT SCIENCES, BIOTECHNOLOGY AND HORTICULTURE CONCENTRATION

Agricultural Economics 330, 342, 350, 412; Accounting 200; Biochemistry and Cellular and Molecular Biology 310, 330, 401, 402, 404; Biology 240; Biosystems Engineering Technology 326; Business Administration 201; Chemistry 350; Ecology and Evolutionary Biology 304, 410, 414, 433; English 360\*; Entomology and Plant Pathology 451; Environmental and Soil Sciences 355, 442; Finance 301; Management 300; Marketing 300; Microbiology 210.

### PUBLIC HORTICULTURE CONCENTRATION

Accounting 415; Art 481; Agriculture and Extension Education 346; Communication Studies 440; Ecology and Evolutionary Biology 309, 330, 433; Educational Administration and Policy Studies 200; Educational Psychology 210; English 360\*; Human Resource Development 562; Philosophy 245\*; Public Relations 270, 470; Recreation and Leisure Studies 201, 430.

### TURFGRASS SCIENCE AND MANAGEMENT CONCENTRATION

Agricultural Economics 212; Biosystems Engineering Technology 202, 212, 452, 462; Entomology and Plant Pathology 321, 410; Environmental and Soil Science 324.

*Courses marked with an \* meet the University General Education Requirement.*

## PLANT SCIENCES MAJOR LANDSCAPE DESIGN AND CONSTRUCTION CONCENTRATION

Landscape designers create aesthetic concepts and practical designs for improved outdoor living. Students study fundamental and advanced landscape design, landscape design graphics, computer-aided landscape design, surveying, art, socio-economic impact of plants, field botany, professional practices, contracting, basic woody plant identification, landscape construction and maintenance methods. The development of comprehensive design projects helps students prepare for careers in landscape design or advanced studies in landscape architecture. Graduates in design and construction are prepared for employment in several professions in ornamental horticulture. Careful selection of departmental courses and other electives in consultation with the assigned academic advisor will allow graduates to pursue suitable career paths.

### Requirements for the Bachelor of Science in Plant Sciences • Plant Sciences Major • Landscape Design and Construction Concentration

First Year	Hours	Credit
Biology 111*, 112*	8	
Chemistry 100* or 120*	4	
Computer Science 100* or 102*	3	
English 101*, 102*	6	
Mathematics 113*, 123* or 151*	3	
Plant Sciences 120	2	
1Social Sciences Elective*	3	

<b>Second Year</b>	
1Arts and Humanities Elective*	.3
Communication Studies 210* or 240*	.3
Economics 201*	.4
Environmental and Soil Sciences 210	.4
Plant Sciences 210, 220, 280	.8
Technical Electives	.6
Unrestricted Elective	.3
<b>Third Year</b>	
1Cultures and Civilizations Elective*	.3
Plant Sciences 350, 380	.6
Select from Plant Sciences 226, 230, 240, 330, 348, 360, 370	.5-6
Plant Sciences 290 or 291	.3
Technical Electives	.6
Unrestricted Electives	.6-7
<b>Third Year – Summer</b>	
Plant Sciences 492	.3
<b>Fourth Year</b>	
Agricultural Economics 310	.1
1Arts and Humanities Elective*	.3
1Cultures and Civilizations Elective*	.3
Plant Sciences 421, 460, 480, 485	.11
Select from Plant Sciences 348, 410, 427, 429, 430, 434, 441, 446, 459, 493	.5-6
Technical Electives	.7-8
Total 124	

\* Meets University General Education Requirement.  
 1 Choose from the University General Education lists. Selection should be made in conference with academic advisor.  
 Students must meet the University General Education Requirement for Communicating through Writing by selecting a course with a (WC) designation. This course may be in the major or from another discipline.

## PLANT SCIENCE, BIOTECHNOLOGY AND HORTICULTURE CONCENTRATION

The plant science, biotechnology and horticulture concentration is designed for students desiring to pursue professions in biotechnology or commercial production of agronomic and horticultural crops. This concentration also prepares students for graduate studies in plant sciences. Careful selection of departmental courses and other electives in consultation with the assigned academic advisor will prepare graduates for the career of their choice. The concentration consists of two tracks of study – emphasis in production horticulture and emphasis in science and biotechnology.

### Requirements for the Bachelor of Science in Plant Sciences • Plant Sciences Major • Plant Science, Biotechnology and Horticulture Concentration

First Year	Hours Credit
Biology 111*, 112*	.8
Chemistry 100 and 110*, or 120* and 130*	.8
English 101*, 102*	.6
Mathematics 151*, 152*	.6
Plant Sciences 120	.2
<b>Second Year</b>	
Agriculture and Natural Resources 290	.3
Agricultural Economics 212	.3
1Arts and Humanities Elective*	.3
Communication Studies 210* or 240*	.3
1Cultures and Civilizations Elective*	.3
Environmental and Soil Sciences 210	.4
Economics 201*	.4
Plant Sciences 210	.2
1Social Sciences Elective*	.3
Technical Electives	.4
<b>Third Year</b>	
Agricultural Economics 310	.1
Biochemistry and Cellular and Molecular Biology 321 or Forestry 414	.4
1Cultures and Civilizations Elective*	.3

English 360* for Production Horticulture Track; or Chemistry 350 for Science and Biotechnology Track	.3
Environmental and Soil Sciences 334	.3
Plant Sciences 240, 241, 330, 335, 370, 410, 430, 434, 435	.8
Plant Sciences 457-458 or 457-459;	
Entomology and Plant Pathology 313 or 321 or 410	.6
Technical Electives	.3
<b>Fourth Year</b>	
1Arts and Humanities Elective*	.3
Plant Sciences 240, 241, 335, 370, 410, 430, 434, or 435 for Production Horticulture Track; or Plant Sciences 353, 454 for Science and Biotechnology Track	.6
Plant Sciences 470	.3
Plant Sciences 492 or 497	.3
Plant Sciences 331 and Technical Electives for Production Horticulture Track; or Plant Sciences 461 for Science and Biotechnology Track	.3
Technical Electives	.10
Unrestricted Electives	.3
Total 124	

\* Meets University General Education Requirement.  
 1 Choose from the University General Education lists. Selection should be made in conference with academic advisor.  
 Students must meet the University General Education Requirement for Communicating through Writing by selecting a course with a (WC) designation. This course may be in the major or from another discipline.

## PUBLIC HORTICULTURE CONCENTRATION

The public horticulture concentration is intended for students interested in professional careers that promote horticulture and emphasize people, their education and their enjoyment of plants. Such careers include director of a botanical garden or park; city or urban horticulturist; extension agent, teacher, educational director, or program coordinator; professional garden writer/editor or publication manager; horticulture therapist; public garden curator; and plant collections manager. Technical electives allow students to concentrate in specialties of their interest while encouraging the development of strong communication skills. Students are encouraged to earn a minor degree in a supportive field such as education, communications or journalism, or earn a Non-Profit Management Certificate.

### Requirements for the Bachelor of Science in Plant Sciences • Plant Sciences Major • Public Horticulture Concentration

First Year	Hours Credit
1Arts and Humanities Electives*	.3
Biology 111*, 112*	.8
Chemistry 100* or 120*	.4
Computer Science 100* or 102*	.3
English 101*, 102*	.6
Environmental and Soil Sciences 210	.4
Mathematics 113*, 123*, or 151*	.3
<b>Second Year</b>	
1Arts and Humanities Elective*	.3
Communication Studies 240*	.3
1Cultures and Civilizations Elective*	.6
Plant Sciences 210	.2
Plant Sciences 220, 226, 280, 290	.11
1Social Sciences Elective*	.3
Technical Electives	.3
<b>Third Year</b>	
Economics 201*	.4
Plant Sciences 230, 240, 328, 330, 348, 370, 410, 434, 436	.21
Technical Electives	.6
<b>Third Year – Summer</b>	
Plant Sciences 492	.3

**Fourth Year**

Agricultural Economics 310	.1
Entomology and Plant Pathology 313 or 321	.3
Entomology and Plant Pathology 410	.3
Plant Sciences 427, 430, 437, 446, 470	.12
Plant Sciences 448 or 494	.3
Technical Electives	.3
Plant Sciences 421 or Unrestricted Electives	.3
Total 124	

\* Meets University General Education Requirement.

1 Choose from the University General Education lists. Selection should be made in conference with academic advisor.

Students must meet the University General Education Requirement for Communicating through Writing by selecting a course with a (WC) designation. This course may be in the major or from another discipline.

## TURFGRASS SCIENCE AND MANAGEMENT CONCENTRATION

The turfgrass science and management concentration is designed for the student desiring to pursue professions that include growing and managing turfgrasses used for golf courses, parks, athletic fields, sports complexes, and residential and commercial lawns. This concentration also prepares students for graduate studies in turfgrass science. Students are encouraged to earn a minor degree in a supportive field such as agricultural economics or environmental and soil sciences. Careful selection of departmental courses and other electives in consultation with the assigned academic advisor will prepare graduates for the career of their choice.

### *Requirements for the Bachelor of Science in Plant Sciences • Plant Sciences Major • Turfgrass Science and Management Concentration*

First Year	Hours Credit
1Arts and Humanities Elective*	.3
Chemistry 100* and 110*, or 120* and 130*	.8
1Cultures and Civilizations Elective*	.3
English 101*, 102*	.6
Mathematics 123* and 125*, or 151* and 152*	.6
1Social Sciences Elective*	.3
<b>Second Year</b>	
Agriculture and Natural Resources 290	.3
Biology 111*, 112*	.8
Communication Studies 210* or 240*	.3
Economics 201*	.4
Environmental and Soil Sciences 210	.4
Plant Sciences 240, 241	.3
Plant Sciences 210, 220, 280 or 290	.2-3
Unrestricted Electives	.3-4
<b>Third Year</b>	
1Cultures and Civilizations Elective*	.3
Plant Sciences 210, 220, 280 or 290	.2-3
Plant Sciences 330, 331, 341, 343, 348, 442, and 457-458	.13
Technical Electives	.3
Unrestricted Electives	.9-10
<b>Third Year – Summer</b>	
Plant Sciences 492	.3
<b>Fourth Year</b>	
Agricultural Economics 310	.1
1Arts and Humanities Elective*	.3
Biology 250 or Biochemistry and Cellular and Molecular Biology 321	.4
Entomology and Plant Pathology 313	.3
Environmental and Soil Sciences 334	.3
Select from Plant Sciences 353, 360, 410, 421, 427, 429, 430, 434, 435, 436, 437, 446, 448*, 451, 461 or 494	.5
Plant Sciences 441, 470	.5
Technical Electives	.6
Total 124	

\* Meets University General Education Requirement.

1 Choose from the University General Education lists. Selection should be made in conference with academic advisor.

Students must meet the University General Education Requirement Communicating through Writing by selecting a course with a (WC) designation. This course may be in the major or from another discipline. Plant Sciences 448 satisfies the Communicating through Writing requirement.

## Minor in Plant Sciences

Required Courses	Hours Credit
A minimum of 18 semester hours of upper-division plant sciences courses	.18
Total 18	