DEPARTMENT OF HORTICULTURAL SCIENCES

Head: D. Lineberger
Graduate Advisor: P. Klein

The graduate programs of the Department of Horticultural Sciences are designed to prepare individuals for careers in research, teaching, extension and industry. Research-oriented programs in the areas of fruit/nut/vegetable production and processing; ornamental horticulture/nursery crops; post-harvest physiology; greenhouse/floriculture; marketing and economics; plant-microbe interactions; viticulture/enology; genetics/genomics; and plant physiology are available to students. Supporting work may be required in several related fields such as chemistry, biology, plant pathology, plant physiology, entomology, soils, genetics, nutrition and agricultural engineering. The specific objective of the individual student will guide his or her committee in the choice of courses from the departments mentioned above and others in special cases. More information on specific programs and faculty can be found at http://hortsciences.tamu.edu/graduate-programs/.

Programs of study leading to the Master of Agriculture, Master of Science and Doctor of Philosophy degrees are available.

Masters

- Master of Agriculture in Horticulture (http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/agriculture-life-sciences/horticultural-sciences/magr)
- Master of Science in Horticulture (http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/agriculture-life-sciences/horticultural-sciences/horticulture-ms)
- Master of Science in Plant Breeding (http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/agriculture-life-sciences/horticultural-sciences/plant-breeding-ms)

Doctoral

- Doctor of Philosophy in Horticulture (http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/agriculture-life-sciences/horticultural-sciences/horticulture-phd)
- Doctor of Philosophy in Plant Breeding (http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/agriculture-life-sciences/horticultural-sciences/plant-breeding-phd)

Courses

HORT 604 Applied Physiology of Horticultural Crops
Credits 3.3 Lecture Hours.
Chemical, biological and environmental factors in growth and differentiation and their application to ornamental, fruit and vegetable crops; growth kinetics; source-sink relations; fruit development; seed development and germination; juvenility; apical dominance; growth retardants; pruning; photoperiodism; flowering; sex expression; and senescence.
Prerequisite: MEPS 313 or approval of instructor.

HORT 608 Plants for Landscape Design
Credits 4.3 Lecture Hours. 2 Lab Hours.
Identification and use of indigenous and introduced plants in landscape designs; plants for special uses in commercial and residential developments; emphasis on ornamental attributes, identification, cultural requirements, limitations and adaptability in urban and suburban environments for important taxa; discussion of current issues, research, and trends in selection, marketing, and utilization of plants for landscape design.
Prerequisite: HORT 201 or HORT 308 or BIOL 101, or approval of instructor, not open to students with previous credit for HORT 306.

HORT 609 Plants for Landscape Design II
Credits 4.3 Lecture Hours. 2 Lab Hours.
Identification and use of indigenous and introduced landscape plants; plants for special uses in urban environments; emphasis on plants' ornamental attributes, cultural requirements, and adaptability in urban and suburban environments. Not open to students who have completed HORT 308.
Prerequisites: BOTN 101, HORT 201, HORT 306, HORT 608, or approval of instructor.

HORT 610/MEPS 610 Physiological and Molecular Basis for Plant Stress Response
Credits 3.3 Lecture Hours.
Provide the tools to understand the molecular and physiological consequences caused by environmental factors (abiotic and biotic) on plant growth and development and the mechanisms of stress adaptation to stress.
Prerequisite: MEPS 313 or equivalent.
Cross Listing: MEPS 610/HORT 610.

HORT 611 Ecology of Urban Landscape
Credits 3.3 Lecture Hours.
Basic concepts and current topics in ecology or urban landscapes; role of plants in urban and fragmented ecosystems ranging from individual plant responses to changes in ecosystem function; discuss recent literature in the field of urban plant ecology.
Prerequisite: An undergraduate or graduate class in plant biology or plant ecology is recommended.

HORT 618/MEPS 618 Root Biology
Credits 3.3 Lecture Hours.
Basic concepts and current topics in root-soil ecology; managed and natural ecosystems including grasslands, cropping systems and forests; role of roots in the rhizosphere, the effects of soil, nutrient and water stress and climate change in C and N cycling and carbon sequestration; participate in discussions and critique recent literature.
Prerequisite: Approval of instructor.
Cross Listing: MEPS 618/HORT 618.

HORT 619 Plant-Associated Microorganisms
Credits 3.3 Lecture Hours.
Basic concepts and current topics in plant-microbe interactions including the diversity of plant-associated microorganisms; the plant as a microbial environment; endophytes; microbial roles in plant nutrition and fitness; uses of microorganisms for improved plant health and sustainable agriculture; microbial roles in food safety and future challenges; discussion of current literature.
Prerequisites: Basic plant biology or plant ecology is recommended; microbiology is helpful, but not required. Cross listed with PLPA 619 and MEPS 619.
HORT 626 International Floriculture Marketing  
Credits 3. 2 Lecture Hours. 2 Lab Hours. 
Importance, cost and opportunities in marketing floral products, fresh cut flowers, flowering potted plants, foliage plants, and bedding/garden plants; topics include world production areas, economic value, species grown, marketing channels, retail environments, current/future consumers, postharvest handling, promotion/advertising, perceived/added value, marketing trends and employment opportunities. 
Prerequisite: Graduate classification.

HORT 630 Post-Harvest Biology, Physiology and Genetics of Plants  
Credits 3. 3 Lecture Hours. 
Overview of biological, physiological and genetic mechanisms which impart phenotypes associated with quality and value of plant products; current emphasis in areas of ripening, senescence, fruit and flower development, and relevant applications of biotechnology will be focus of course. 
Prerequisite: Approval of instructor.

HORT 640 Phytochemicals in Fruits and Vegetables to Improve Human Health  
Credits 3. 3 Lecture Hours. 
Current scientific knowledge about the role of phytochemicals in their diet; increased knowledge and awareness of successful, cost effective, public and private integrated approaches to reduce the health and economic burden of chronic diseases; provide instructional curricular resources media for dissemination through conventional and distance education technology. 
Prerequisite: Approval of instructor.

HORT 641 Science of Foods for Health  
Credits 3. 3 Lecture Hours. 
Recent scientific advances on knowledge of foods for health using evidence based research justification; includes interdisciplinary topics emphasizing horticultural science, nutrition and biochemistry. 
Prerequisite: Approval of instructor.

HORT 645/SCSC 645 World Agriculture and International Plant Breeding  
Credit 1. 1 Lecture Hour. 
Evolution of world agriculture; plant breeding and improved varieties; international agricultural research centers and green revolution; population growth; environmental challenges; IPR; role of plant breeding and biotechnology in meeting world food needs. 
Prerequisite: SCSC 304, HORT 404/GENE 404 or approval of instructor. 
Cross Listing: SCSC 645/HORT 645.

HORT 681 Seminar  
Credit 1. 1 Lecture Hour. 
Student and staff participation in review of literature and reporting on current developments in research on production and processing of horticultural crops. Required of all graduate students in horticulture and floriculture. May be taken more than once but not exceed 3 hours of credit. 
Prerequisite: Graduate classification.

HORT 684 Professional Internship  
Credits 1 to 4. 1 to 4 Other Hours. 
Program planned to provide professional training in student’s particular field of interest. Faculty and employer will supervise the activity. Work-study planned as a part of the Master of Agriculture degree program in fruit, ornamentals or vegetable production, processing and handling or landscape or garden design and maintenance. 
Prerequisite: Approval of instructor.

HORT 685 Directed Studies  
Credits 1 to 4. 1 to 4 Other Hours. 
Individual problems of research or scholarly activity not pertaining to thesis or dissertation, or selected instruction not covered by other courses. Final documentation of directed study is required. 
Prerequisite: Approval of instructor.

HORT 689 Special Topics in...  
Credits 1 to 4. 1 to 4 Lecture Hours. 1 to 4 Lab Hours. 
Selected topics in an identified area of horticulture. May be repeated for credit. 
Prerequisite: Approval of department head.

HORT 690 Theory of Research  
Credit 1. 1 Lecture Hour. 
Design of research experiments in various fields of horticulture and floriculture and evaluation of results with the aid of examples taken from the current scientific literature. May be repeated for credit.

HORT 691 Research  
Credits 1 to 23. 1 to 23 Other Hours. 
Research in horticultural problems for thesis or dissertation.

HORT 693 Professional Study  
Credits 1 to 9. 1 to 9 Other Hours. 
Approved professional paper undertaken as the requirement for the Master of Agriculture. May be taken more than once, but not to exceed 3 hours of credit towards a degree. 
Prerequisite: Graduate classification.