HORT-HORTICULTURE

HORT 1115G. Introductory Plant Science
4 Credits (3+2P)
Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as AGRO 1110G.
Learning Outcomes
1. Describe the role plants play in everyday lives
2. Introduce career opportunities in plant and soil sciences, and related fields
3. Define plants through the concepts of plant structure and anatomy
4. Introduce the wide variety of plants cultivated throughout the world
5. Describe how plants work (growth, reproduction, physiology, and soil)
6. Describe how plants are manipulated to feed, clothe and entertain the world

HORT 2110. Ornamental Plants I
4 Credits (2+3P)
Covers identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on deciduous trees, native shrubs, and evergreens.
Learning Outcomes
1. Identify landscape plants by scientific names, including family, genus and specific epithet.
2. Use scientific terminology to accurately describe landscape plant morphology.
3. Illustrate plant family relationships at the family and genus level.
4. Apply landscape design principles and knowledge of plant requirements to arrange plants in a landscape.

HORT 2120. Ornamental Plants II
4 Credits (2+3P)
Identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on flowering trees, cacti, and members of the pea and rose families.
Learning Outcomes
1. Identify landscape plants by scientific names, including family, genus and specific epithet.
2. Use scientific terminology to accurately describe landscape plant morphology.
3. Illustrate plant family relationships at the family and genus level.
4. Apply landscape design principles and knowledge of plant requirements to arrange plants in a landscape.

HORT 2130. Floral Quality Evaluation and Design
2 Credits (1+2P)
Critical hands-on evaluation of the quality of cut and potted floral and tropical foliage crops, their specific merits and faults, and fundamentals of floral design.
Learning Outcomes
1. Identify common floriculture crops, or know resourcing to help identify the crop.
2. Evaluate quality (merit and fault) of common floriculture crops, based on industry standards and merit. Pi Alpha Xi and American Floral Endowment standards will be used for the purpose of this class.
3. Have a basic understanding of the floriculture industry, and identify career pathways within the industry.
4. Know, understand, creatively interpret, and execute basic principles of design in regards to floral design.
5. Use interpersonal communication, problem solving, basic math, and marketing during cash and carry "lab" time (flower sales) in developing job ready skills in floristry.
6. Layer principles of design, marketing, sales, and time management to create floral art in real-world scenarios.

HORT 2160. Plant Propagation
3 Credits (2+2P)
Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Same as AGRO 2160.
Learning Outcomes
1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, “hands-on” laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

HORT 2990. Floriculture Field Practicum
1 Credit (1)
Participation as team member in the National Intercollegiate Floral Quality Evaluation and Design Competition. Intensive week-long travel for competition, networking with industry, academia, and floriculture tours. May be repeated for a maximum of 3 credits.
Prerequisite(s): HORT 2130 or consent of instructor.
Learning Outcomes
1. Varies

HORT 2996. Special Topics
1-4 Credits
Specific subjects and credits as announced. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.
Learning Outcomes
1. Varies

HORT 300. Special Topics
1-4 Credits
Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

HORT 302V. Forestry and Society
3 Credits (3)
Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as RGSC 302V.
Learning Outcomes
1. Demonstrate comprehension of basic plant physiology.
2. Analyze various inputs and environmental factors that affect trees and forests.

3. Identify forest biomes based on plant morphology and environmental characteristics.
4. Categorize different types of forest products and harvesting methods.
5. Compare and contrast various forest management practices in the US and worldwide.
6. Evaluate climate and ecological issues as they relate to society.
7. Develop an awareness of the interconnection of nature and society.

HORT 304. Hydroponics
4 Credits (4)
This course will introduce students to the basics of the different soil-less growing systems: hydroponics, aeroponics and aquaponics. Topics will include growing systems and environments, crop management, business aspects of hydroponic growing, integrated pest management, commercial and restaurant systems, and plant nutrition. Labs will reinforce lecture topics and give students practical experience growing different types of crops in different types of systems.
Prerequisite: AGRO 1110G or HORT 1115G.
Learning Outcomes
1. Discuss the benefits and constraints of different hydroponic systems.
2. Evaluate different crops for each type of system.
3. Identify the components and calculate costs of different systems.
4. Demonstrate how to build and maintain each type of system.
5. Discuss how soilless growing relates to sustainability and local food production.

HORT 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

HORT 307. Landscape Design
4 Credits (3+3P)
Design elements, the design process, and contemporary planting design used in the design of residential and small commercial landscapes. Basic drafting, drawing, and landscape plan presentation techniques.
Prerequisite: HORT 2110 or HORT 2120 or consent of instructor.
Learning Outcomes
1. Access a residential site for landscape design.
2. Create a landscape plan that addresses and solves a client's needs and wishes.
3. Incorporate ideas into the landscape plan that reflects the region.
4. Incorporate sustainable ideas into a landscape plan.
5. Analyze a landscape plan for aesthetics and functionality.
6. Verbally and visually present a landscape plan in a professional manner.

HORT 310. Medicinal Herbs
3 Credits (3)
Introduction to ethnobotany, including plant cultivation, extraction methods, and analysis of active chemistries.
Learning Outcomes
1. Describe relationships between people and plants.
2. Identify cultural uses of plants by peoples across the world.
3. Discuss the westernized use of plants and regulations associated with medicinal plant products.
4. Discuss the scientific methods employed to study medicinal plant compounds.
5. Identify medicinal plant chemical structures.
6. List medicinal plant tincture preparation methods.
7. Discuss analytical chemistry instrumentation used to identify plant compounds.

HORT 318V. Urban Water Issues and Society
3 Credits (3)
Global study of water science, development, law, and use for agriculture, manufacturing, landscaping, home use, and other urban uses. This course allows students to become familiar with important issues concerning the interaction between water use and humans. Topics include the water cycle, water chemistry, human-water relations, plant-water relations, water users, water-dependent population placement and growth, water regulation, and the future of water.
Learning Outcomes
1. Define and describe Earth's water sources and the water cycle.
2. Describe the chemical processes associated with water and analyze the composition of several water sources.
3. Summarize the interactions of water with the human body.
4. Explain the use of water in agricultural and other plants on both a regional scale and cellular level.
5. Identify, explain, and compare all water users and categorize their demand and availability for water.
6. Analyze the interconnection of the human societies and water while discussing locations of civilizations and communities.
7. Analyze, from a historical perspective, the interrelationships of all water users and all water decision makers. Describe the history of US and world water regulation and analyze its success rate.
8. Predict and recommend how water will be used and distributed in the future.

HORT 340. Greenhouse Retailing
2 Credits (1+1P)
A hands-on experience in weekly organizing, management, propagation and sale of greenhouse crops. This course is to learn how to propagate crops to achieve the fastest finished products, maintain the stock plant, and create opportunities for sales. Students will work 2 hours a week in the greenhouse with instructor, and choose one day a week to maintain and check on the greenhouse throughout the semester. May be repeated up to 4 credits.
Learning Outcomes
1. Identification and propagation of common greenhouse plants.
2. Create care sheets and propagation manuals for potential buyers of greenhouse crops.
3. Propagate, maintain, water, schedule and sell greenhouse products.

4. Practice team communication and support to create an equitable division of labor during the semester.
5. Learn to maintain labor and sales records.

HORT 365. Principles of Crop Production
4 Credits (3+3P)
Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Taught with AGRO 365. May be repeated up to 4 credits.
Prerequisite: AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.
Learning Outcomes
1. Analyze and apply core principles of crop production, including environmental, physiological, and climatic factors, to optimize plant growth, yield, and overall production efficiency.
2. Demonstrate understanding of plant biology by identifying structures, growth stages, and functions across the plant life cycle.
3. Evaluate plant propagation and reproduction methods by distinguishing between sexual and asexual techniques, explaining pollination and fertilization processes, and discussing their impact on genetic improvement and crop uniformity.
4. Demonstrate proficiency in seed and equipment technologies, including identification and calibration of farm implements, calculation of seed rates, and evaluation of certified seed quality and planting operations.
5. Apply experiential learning methods to design, manage, and assess crop production systems using real-world data and reflection-based decision-making models (Kolb's learning cycle).

HORT 377. Introduction to Turfgrass Management
4 Credits (3+3P)
Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with: AGRO 377
Learning Outcomes
1. Identify the general morphology of grass plants and the characteristics of cool- and warm-season grasses.
2. Explain various turf establishment techniques and procedures.
3. Demonstrate understanding of basic soil science, soil testing, amendments, and fertilization regarding cultural and maintenance procedures as well as seasonal projects to maintain healthy turf.
4. Recognize and identify common turf disturbances including weed, pest, and disease identification.
5. Communicate turf conditions and the rationale for different maintenance processes on the course or field.

HORT 378. Turfgrass Science
4 Credits (3+3P)
Introduction to the scientific fundamentals for turfgrass management cultural practices, pest management, rootzone construction and ecology. May be repeated up to 4 credits.
Prerequisite: HORT 377 or consent of instructor.
Learning Outcomes
1. Explain the benefits and history of turfgrass.
2. Apply basic plant physiological knowledge to turfgrass adaptation, growth and function.
3. Demonstrate ability to identify known and unknown turfgrasses and appraise how, when and why specific turfgrasses are used in certain environments.
4. Examine the basic principles of turfgrass soils, turfgrass establishment and major turfgrass management practices (mowing, fertility, irrigation, cultivation, secondary cultural practices).
5. Examine basic turfgrass pest management principles and practices in order to be able to identify, analyze and implement solutions.
6. Calculate common turfgrass math calculations and perform equipment calibrations.
7. Analyze how the environment influences turfgrass growth and management.
8. Prepare a consulting appraisal and specific turfgrass management plan using learned turfgrass knowledge.

HORT 391. Internship
1-6 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of instructor required. Graded: S/U. Crosslisted with: AGRO 391 and SOIL 391

HORT 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, SOIL 447 and ENVS 447.
Learning Outcomes
1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

HORT 449. Special Problems
1-3 Credits
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

HORT 450. Special Topics
1-4 Credits
Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

HORT 462. Plant Breeding
3 Credits (3)
Principles and practices involved with the genetic improvement of plants.
Prerequisite: ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 320.
Learning Outcomes
1. Learn the principles and practices involved in plant genetic improvement.
2. Be able to apply principles and practices in real life scenarios.

HORT 471. Plant Mineral Nutrition
3 Credits (3)
Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as AGRO/EPWS 471.

Prerequisite/Corequisite: EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.

Learning Outcomes

1. Describe how minerals function in plants, including uptake, transport and heritability factors.
2. Explain how plants regulate internal mineral content.
3. Compare different crop nutrient management practices.
4. Identify plant mineral disorders and stressors.
5. Prepare and present information on crop mineral nutrition.

HORT 479. Advanced Turfgrass Science
3 Credits (3)

Extensive reviews of turfgrass sciences including ecology, physiology, entomology, pathology, weed science, and soil science.

Prerequisite: HORT 378 or consent of instructor.

Learning Outcomes

1. Discuss the fundamentals of turfgrass management practices including mowing, fertilization, irrigation, cultural practices and pest management, and use these practices to plan an integrated turfgrass management plan.
2. Identify common and unique turfgrass problems and situations and formulate a solution based on prior knowledge learned.
3. Analyze how stresses, construction and turfgrass management practices affect growth, development, and physiology of turfgrasses.
4. Ascertain how environmentally sound management practices can be modified to promote optimal turfgrass health under stress conditions.
5. Critically evaluate scientifically based literature on turfgrass management.

HORT 483. Advanced Sustainable Crop Production
4 Credits (3+3P)

Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of agronomic and vegetable crops.

Prerequisite: AGRO 365 or HORT 365.

Learning Outcomes

1. Design and evaluate sustainable cropping systems by integrating principles of crop diversification, crop rotation, no-till, and organic practices, and assessing their advantages, challenges, and impact on long-term agricultural sustainability.
2. Analyze and apply crop and soil management strategies using holistic and integrated approaches, including mycorrhizal fungi use in arid environments, IPM (Integrated Pest Management), and the "many little hammers" approach to weed control.
3. Select and recommend crop cultivars and management practices for specific agronomic and horticultural crops using tools such as growing degree days, variety test reports, and region-specific criteria (for New Mexico).
4. Critically review and communicate sustainable agricultural research and practices by analyzing case studies, scientific literature, and peer presentations to evaluate the effectiveness of sustainability-focused strategies.
5. Identify and engage with agricultural support systems and sustainability networks, including agencies like Western SARE, to explore resources for funding, research, and application of sustainable agriculture practices.

HORT 488. Greenhouse Management
4 Credits (3+3P)

Principles and practices involved in greenhouse structures and construction, site considerations, heating and cooling systems, greenhouse crop production techniques, sustainability practices. May be repeated up to 4 credits.

Prerequisite: HORT/AGRO 365 or consent of instructor.

Learning Outcomes

1. Establish, operate, and maintain a greenhouse.
2. Demonstrate greenhouse business and marketing skills, horticulture techniques.
3. Practice "hands-on" greenhouse production.
4. Describe greenhouse sustainability issues.
5. Identify emerging trends in the greenhouse industry.

HORT 492. Diagnosing Plant Disorders
3 Credits (2+3P)

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and AGRO 492.

Prerequisites: EPWS 303 and EPWS 310.

HORT 500. Special Topics
1-4 Credits

Specific subjects and credits to be announced in the Schedule of Classes . Maximum of 4 credits per semester. No more than 9 credits toward a degree.

HORT 505. Research Orientation
4 Credits (3+2P)

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505, SOIL 505 and ENVS 505.

Learning Outcomes

1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

HORT 513. Introduction to Scientific Writing
3 Credits (3)

Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.

Learning Outcomes

1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.

5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

HORT 525. Scientific Writing How to be a Productive and Effective Writer
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, EPWS 525, SOIL 625 and SOIL 525.

HORT 590. Graduate Seminar
1 Credit (1)
Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as AGRO/SOIL 590. Crosslisted with: AGRO 590 and SOIL 590.

HORT 595. Internship
1-6 Credits
Supervised professional on-the-job learning experience. Limited to Master of Horticulture or Plant & Environmental Science candidates. Not more than 6 credits toward the degree.

HORT 596. Master's Proposal
1 Credit (1)
Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.
Prerequisite: Master level graduate students.
Learning Outcomes
1. Student will review academic literature and draft a research proposal.

HORT 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.
Prerequisite: consent of instructor.

HORT 599. Master's Thesis
15 Credits
Thesis.