

Plant Science (PLNT_S)

PLNT_S 1002: Topics In Plant Science - Biological/Physical/Mathematics

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

Credit Hour: 1-4

PLNT_S 1010: Plant Science Orientation

Introduction to perspectives, comprehensiveness, and current issues in the plant sciences. Involves independent learning, faculty interviews, and oral and written communication about agronomy, horticulture, entomology, and plant pathology.

Credit Hour: 1

PLNT_S 1020: World Food and You

(same as F_S 1020). Basic scientific principles involved in production agriculture, food processing, marketing and consumption. Evaluation and understanding of current agriculture issues that affect human foods and required nutrients.

Credit Hours: 3

PLNT_S 1120: Career Development

Introductory course for students planning a career in plant sciences. Includes an overview of each emphasis area, as well as development of professional skills required for a successful career. Graded on A-F basis only.

Credit Hour: 1

Prerequisites: Plant Science majors only

PLNT_S 1125: People, Plants and the Environment

Exploration of the science and niche relationships that exist between people, plants, animals, and the environment. Emphasis placed on urban vs. rural culture, the impact on production agriculture and the world food supply.

Credit Hours: 3

Prerequisites: restricted to freshmen and sophomores

PLNT_S 2002: Topics in Plant Science - Biological/Physical/Mathematics

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

Credit Hour: 1-4

PLNT_S 2075: Environmental Horticulture

Investigate interrelationships between plants and the environment. Special emphasis placed on improving homeowners' environmental stewardship and their knowledge of sustainable practices. Graded on A-F basis only.

Credit Hours: 3

PLNT_S 2100: Introduction to Soils

(same as SOIL 2100). Introduction to soil sciences with emphasis placed on physical, biological, and chemical properties and application to land use, plant growth and environmental problems.

Credit Hours: 3

Recommended: 3 hrs of Chemistry

PLNT_S 2110: Plants and their Cultivation

Principles of plant growth with emphasis on anatomy, physiology, and response to environmental factors. Production and protection of economically important crop and horticulture species.

Credit Hours: 3

PLNT_S 2125: Plant Structure and Function

Introduction to plant anatomy; physiology; how plant structures and processes are involved in growth/development. Labs explore photosynthesis, mineral nutrition, water relations, growth, and hormonal regulation.

Credit Hours: 3

Prerequisites: BIO_SC 1200 and CHEM 1100 or CHEM 1320

PLNT_S 2150: Plants for Interior Design

Identification, culture and uses of plants adaptable to or capable of becoming acclimated to interior environments.

Credit Hours: 2

PLNT_S 2195: Grapes and Wines of the World

(same as F_S 2195). Explores the world of wine through study of viticultural principles and practices, wine styles, classifying wine, the winemaking process and New World and Old World wine regions. Learn wine tasting skills and experience wines from around the world. World wine consumption, social and physical health benefits of moderate wine consumption.

Credit Hours: 3

PLNT_S 2210: Ornamental Woody Plants

Identification and evaluation of trees and shrubs for landscape use.

Credit Hours: 3

Prerequisites: BIO_SC 1200 or instructor's consent

PLNT_S 2215: Ornamental Herbaceous Plants

Annuals, biennials, perennials, ground covers, and bulbs; their identification, nomenclature classification, culture and use.

Credit Hours: 3

Prerequisites: BIO_SC 1010 or BIO_SC 1500 or BIO_SC 1200

PLNT_S 2220: Introduction to Floral Design

Introduction to the basics of floral design with special emphasis on design mechanics, flower processing, care and handling. Graded on A-F basis only.

Credit Hours: 2

Prerequisites: Some sections of this course may be restricted to Plant Science Majors Only and/or students with 75 credit hours or less

PLNT_S 2221: Everyday Floral Design

Intermediate floral design course expanding skills from introductory floral design with emphasis on the elements and principles of design. Graded on A-F basis only.

Credit Hours: 3

Prerequisites: PLNT_S 2220

PLNT_S 2240: Landscape Graphic Communication

Landscape design is a blend of art and science. This course is designed to help students expand their artistic skills, including graphic communications. Topics included to achieve this goal are drawing mediums and techniques, coloring mediums and techniques, symbol usage, and elevation drawings. Graded on A-F basis only.

Credit Hours: 2

Recommended: ART_DRAW 1050

PLNT_S 2250: Landscape Site Analysis

In order to effectively design what a site can become a landscape designer must first be able to accurately see what it is. This course presents a detailed look at obtaining, calculating, and manipulating a site's topography and features while offering a glimpse into the methods and means required for implementation of the final landscape design. Graded on A-F basis only.

Credit Hours: 2

Recommended: MATH 1100 or equivalent

PLNT_S 2254: Landscape Design

An introduction into the processes, principles, and practices of landscape design, this course begins with site analysis and moves through the drawing and presentation of your landscape concepts.

Credit Hours: 3

Prerequisites: Completion of 30 hours

PLNT_S 2710: Insects in the Environment

Ways in which insects are adapted for life in particular environments, basics of morphology, taxonomy; how important insect pests affect food and crop production, and principles of control.

Credit Hours: 3

PLNT_S 3002: Topics in Plant Science - Biological/Physical/Mathematics

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

Credit Hour: 1-4

PLNT_S 3110: Horticultural Drainage and Irrigation Systems

This course is designed to provide practical knowledge of drainage and irrigation systems for golf courses, sports fields, lawns, landscapes, greenhouses, nurseries and vineyards. Graded on A-F basis only.

Credit Hours: 2

PLNT_S 3130: Undergraduate Seminar in Plant Science

Discussion of assigned or selected topics in Plant Science, including participation in a panel debate and individual seminar oral presentations.

Credit Hour: 1

Prerequisites: Completion of 60 credit hours

PLNT_S 3210: Principles of Weed Science

Introduction to principles of weed growth, reproduction, and impact on human activities. Discussion of weed control techniques and technology, weed identification, and developing weed management strategies.

Credit Hours: 4

Prerequisites: PLNT_S 2110 or BIO_SC 1200

PLNT_S 3213: Genetics of Agricultural Plants and Animals

(same as AN_SCI 3213). Concepts of molecular, transmission, and population and quantitative genetics. Emphasis given to breeding and biotechnological applications in plant and animal agriculture. Prerequisites: MATH 1100 and one of the following: BIO_SC 1100 (or F_W 1100) or BIO_SC 1200 or BIO_SC 1500.

Credit Hours: 3

PLNT_S 3220: Special Occasion Floral Design

Advanced floral design course with emphasis in silk décor, sympathy design and public ceremony design. Graded on A-F basis only.

Credit Hours: 3

Prerequisites: PLNT_S 2220 and PLNT_S 2221 with grade of B or above in both

PLNT_S 3221: Wedding Floral Design

Advanced floral design course with emphasis in wedding floral design and personal pieces design. Graded on A-F basis only.

Credit Hours: 3

Prerequisites: PLNT_S 2220 and PLNT_S 2221 with grade of B or above in both

PLNT_S 3222: Retail Floral Management

Course focusing on all areas of retail floral management: business finance, marketing, products and services, employee management, and customer service. Graded on A-F basis only.

Credit Hours: 3

Prerequisites: PLNT_S 2220 and PLNT_S 2221

PLNT_S 3225: Plant Breeding and Genetics

Mendelian genetic principles and related genetic developments applicable in plant breeding. Discussion of established and new plant breeding procedures applicable to cultivar development.

Credit Hours: 3

Prerequisites: PLNT_S 2110 or equivalent

PLNT_S 3230: Plant Propagation

Principles and practices of propagation of horticultural plants. Prerequisites: One of the following: PLNT_S 2075, BIO_SC 1200, or BIO_SC 1500 or Instructor's consent.

Credit Hours: 3

PLNT_S 3230W: Plant Propagation - Writing Intensive

Principles and practices of propagation of horticultural plants.

Prerequisites: One of the following: PLNT_S 2075, BIO_SC 1200, or BIO_SC 1500 or Instructor's consent.

Credit Hours: 3

PLNT_S 3240: Principles of Viticulture I

(same as F_S 3240). Grapevine growth, development, selection, propagation, training systems, pruning, and harvesting; vineyard site selection, design, and development. Graded on A-F basis only.

Credit Hours: 4

Prerequisites: F_S 1010 and F_S 2195 or PLNT_S 2195; or PLNT_S 2100; or PLNT_S 2110; or PLNT_S 2125

PLNT_S 3250: Green Industry Bidding

Principles of interpreting drawings, estimating labor, equipment, materials and other costs and recordkeeping for preparation of competitive green industry bids. Graded on A-F basis only.

Credit Hours: 2

Prerequisites: Plant Science major and completion of 30 credit hours

PLNT_S 3252: Arboriculture and Pruning

Concepts for establishment and management of urban trees. Emphasis on planting, fertilization, pruning, disease, hazard assessment and components of a municipal trees ordinance.

Credit Hour: 1

Prerequisites: PLNT_S 2210 or instructor's consent

PLNT_S 3254: Landscape AutoCAD

AutoCAD is the most widely utilized computer aided drafting software program in the professional landscape design industry. This course will teach students how to utilize AutoCAD to transform their landscape design skills into a digital format and investigate the benefits of utilizing technology as a design tool. We will also explore other industry utilized software, and their functionality, with focus on landscape design and presentation. Additional software will include, but not be limited to, AutoDesk Revit; Adobe Photoshop; and Sketchup. Graded on A-F basis only.

Credit Hours: 3

Recommended: PLNT_S 2250 and PLNT_S 2254

PLNT_S 3260: Greenhouse Management

Greenhouse design, environmental control and equipment. Practices associated with plant nutrition management, greenhouse pest control, postproduction handling and marketing of greenhouse crops, and greenhouse management are also covered.

Credit Hours: 4

Prerequisites: PLNT_S 2075 or instructor's consent

PLNT_S 3270: Forage Crops

An introduction to principle forage crops, including identification, anatomy, physiology, and growth characteristics. Pasture production and management, grazing systems, and forage preservation and utilization will also be covered.

Credit Hours: 3

Prerequisites: PLNT_S 2125 or AN_SCI 3232 or instructor's consent

PLNT_S 3275: Grain Crops

Lecture and discussion covering production and utilization, plus growth and development of a wide range of grain crops, including Missouri crops. Problem solving tasks include agronomics, economics and environmental factors.

Credit Hours: 3

Prerequisites: PLNT_S 2110 or PLNT_S 2125

PLNT_S 3355: Introductory Turfgrass Management

Characteristics of turf materials, principles of establishment and maintenance.

Credit Hours: 3

Prerequisites: PLNT_S 2100 or instructor's consent

PLNT_S 3385: Problems in Plant Science

Not accepted as a substitute for any regularly scheduled course.

Problems arranged with individual faculty member in specific matter area.

Credit Hour: 1-4

Prerequisites: consent required

PLNT_S 3500: Forest Pathology

Provides basic understanding of biotic and abiotic agents which cause forest diseases, and current approaches to disease control.

Credit Hours: 3

Recommended: 5 hours Biological Sciences or equivalent

PLNT_S 3510: Biology of Fungi

(same as BIO_SC 3510). The diverse roles of fungi in the biosphere will be explored by considering fungi we eat, fungi which destroy our food, fungi in folklore and fungi as global nutrient recyclers.

Credit Hours: 3

Prerequisites: BIO_SC 1200 or BIO_SC 1500 or equivalent

PLNT_S 3710: Introductory Entomology

(same as BIO_SC 3710). Emphasizes the role insects play in the scheme of life. Topics include insect structure, development, diversity, ecology, communication and behavior, and management. Prerequisites: Completion of 60 credit hours and one of the following: BIO_SC 1100 (or F_W 1100) or BIO_SC 1200, or BIO_SC 1500.

Credit Hours: 3

PLNT_S 3715: Insect Diversity

(same as BIO_SC 3715). Laboratory exercises emphasizing external insect anatomy, classification, and identification (to family level). Preparation of an insect collection is required.

Credit Hours: 2

Prerequisites or Corequisites: PLNT_S 3710 (or BIO_SC 3710)

PLNT_S 4002: Topics in Plant Science - Biological/Physical/Mathematics

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

Credit Hour: 1-4

PLNT_S 4313: Soil Fertility and Plant Nutrition

(same as SOIL 4313; cross-leveled with PLNT_S 7313, SOIL 7313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of soil amendments.

Credit Hours: 3

Prerequisites: SOIL 2100 or instructor's consent

PLNT_S 4314: Soil Fertility and Plant Nutrition Laboratory

(same as SOIL 4314; cross-leveled with PLNT_S 7314, SOIL 7314). The application of elementary analytical procedures to the evaluation of the nutrient status of soils and crop plants.

Credit Hours: 2

Prerequisites or Corequisites: SOIL 4313

PLNT_S 4315: Crop Physiology

(cross-leveled with PLNT_S 7315). Basic course on crop growth and development. Emphasis is on physiological processes and morphology of crop plants, and their application to crop breeding and management decisions.

Credit Hours: 3

Prerequisites: PLNT_S 2125 or equivalent

PLNT_S 4320: Molecular Plant Physiology

(same as BIO_SC 4320; cross-leveled with PLNT_S 7320, BIO_SC 7320). Modern physiology of higher plants using common cultivated plants as examples. Prerequisites: CHEM 1320 or CHEM 1330 and one of the following: BIO_SC 1500 or BIO_SC 1200.

Credit Hours: 3

PLNT_S 4325: Field Crop Breeding

(cross-leveled with PLNT_S 7325). Will introduce students to the application of genetics and the plant sciences to the breeding and improvement of self-pollinated field crops. Classical, current and innovative plant breeding techniques will be addressed.

Credit Hours: 3

Prerequisites: PLNT_S 2110 or PLNT_S 2125, and PLNT_S 3213 (or equivalent), and PLNT_S 3225 (or equivalent)

PLNT_S 4330: Plant Breeding Theory

(cross-leveled with PLNT_S 7330). Designed to provide a logical application of genetic concepts to mating and selection theory in general improvement of cross pollinated crops.

Credit Hours: 3

Prerequisites: PLNT_S 3225 or equivalent

PLNT_S 4340: Principles of Viticulture II

(same as F_S 4340). Environmental and biological factors influencing vine physiology and winegrape quality. Irrigation, canopy management, pest and disease control, budgets and current trends in viticulture. Graded on A-F basis only.

Credit Hours: 4

Prerequisites: F_S 3240 or PLNT_S 3240

PLNT_S 4345: Principles of Viticulture and Winemaking

(same as F_S 4345; cross-leveled with PLNT_S 7345, F_S 7345). This course will cover the basics needed by viticulturists and winemakers to understand grape vine growth and vineyard considerations along with winemaking principles. Viticultural topics will include grapevine growth and development, vineyard design and development, cultivar selection, grapevine propagation, training systems, and harvest and pruning. Winemaking topics will include sensory analysis of grapes, chemical, microbiological and technological aspects of winemaking, and the analytical methods used for juice and wine analysis. Graded on A-F basis only.

Credit Hours: 3

Prerequisites: BIO_SC 1010 or BIO_SC 1020 or BIO_SC 1030

PLNT_S 4350: Nursery Crop Production and Management

Operations, methods used by wholesale, retail, landscape nurseries. Field problems, observational trips.

Credit Hours: 4

Recommended: PLNT_S 3230 and PLNT_S 3235

PLNT_S 4355: Advanced Turfgrass Management

(cross-leveled with PLNT_S 7355). Provides turfgrass majors a more informative and applicable look at mathematics of turfgrass management, application techniques, cultural practices, and soil/water relationships applicable to careers in golf course and sports turf management, lawn care, and professional grounds maintenance.

Credit Hours: 3

Prerequisites: PLNT_S 3355 or instructor's consent

PLNT_S 4360: Precision Agriculture Science and Technology

(same as AG_S_M 4360, SOIL 4360; cross-leveled with PLNT_S 7360, AG_S_M 7360, SOIL 7360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating decisions and management.

Credit Hours: 3

Prerequisites: PLNT_S 2100 or SOIL 2100, or PLNT_S 2110, or instructor's consent

PLNT_S 4365: Greenhouse Crops Production

(cross-leveled with PLNT_S 7365). Production management decision and commercial culture of the major floriculture crops.

Credit Hours: 4

Prerequisites: PLNT_S 3260 or instructor's consent

PLNT_S 4385: Problems in Plant Science

Special problem in plant pathology designed for the minor program in Plant Pathology. Problems arranged on an individual student basis.

Credit Hours: 3

PLNT_S 4400: Plant Anatomy

(same as BIO_SC 4400; cross-leveled with PLNT_S 7400, BIO_SC 7400). Comparative structure, growth of meristems; development, structure of important cell types, tissues systems; comparative anatomy of stem, root, leaf. Emphasizes anatomy of gymnosperms, angiosperms. Includes lab. Graded on A-F basis only.

Credit Hours: 4

Prerequisites: BIO_SC 1200 or equivalent

PLNT_S 4500: Biology and Pathogenesis of Plant-Associated Microbes

(cross-leveled with PLNT_S 7500). Diagnosis of diseases of plants caused by fungi, nematodes, viruses and bacteria Environmental and genetic factors leading to disease development and strategies for disease management, including biotechnology. Prerequisites: 5 hours from the following courses: BIO_SC 1010, BIO_SC 1020, BIO_SC 1030, BIO_SC 1100, BIO_SC 1200 or BIO_SC 1500; and completion of 60 credit hours.

Credit Hours: 4

PLNT_S 4520: Environmental Microbiology

Fundamental knowledge of selected microbial processes that are important in agriculture, environmental detoxification, and microbial biotechnology. Emphasis is on molecular, genetic and physiological aspects of nitrogen metabolism, bioconversions, antibiosis and biocontrol.

Credit Hours: 3

PLNT_S 4550: Plant Biotechnology

(cross-leveled with PLNT_S 7550). Principles of gene expression, metabolic pathway analysis and data mining, plant tissue culture and transformation, transgene integration and expression analysis, plant epigenome, emerging transgenic technologies, etc. Prerequisites: PLNT_S 2125 and one of the following: PLNT_S 3213, or BIO_SC 2200 or BIO_SC 2300.

Credit Hours: 4

PLNT_S 4710: Systematic Entomology

(cross-leveled with PLNT_S 7710). Taxonomy of insects: emphasizes biology and classification of orders and suborders in lecture, and major families in lab. Insect collection required. Prerequisites: PLNT_S 3715 and one of the following: BIO_SC 1100 or BIO_SC 1500.

Credit Hours: 5

PLNT_S 4720: Aquatic Entomology

(cross-leveled with PLNT_S 7720). Identification, life histories, ecology of aquatic insects. Grading is based on lecture, lab, and a collection. For students of wildlife, fisheries management, aquatic biology, advanced entomology.

Credit Hours: 3

Prerequisites: PLNT_S 3710 or PLNT_S 3715 or equivalent, or instructor's consent

PLNT_S 4730: Insect Pest Management for Plant Protection

(cross-leveled with PLNT_S 7730). History and concepts of Integrated Pest Management of insect pests, emphasizing complementary use of

biological control, plant resistance, environmental manipulations, genetic manipulations, and selective use of insecticides.

Credit Hours: 3

Prerequisites: PLNT_S 3710 or instructor's consent

PLNT_S 4940: Internship in Plant Science

Combines study, observation, and employment with an industry or government agency in area of agronomy or horticulture. Written and oral reports and faculty evaluation.

Credit Hours: 3

Prerequisites: Completion of 75 hours including two courses in department and instructor's consent

PLNT_S 4950: Undergraduate Research in Plant Science

Capstone experience consisting of investigations in Plant Science in support of an undergraduate thesis or special project portfolio.

Credit Hour: 1-3

Prerequisites: Completion of 75 credit hours and Plant Science Majors only

PLNT_S 4965: Special Readings in Plant Pathology

Independent readings and discussions of topics in entomology selected in consultation with supervising faculty member. Paper required.

Credit Hour: 1-99

PLNT_S 4970: Readings in Molecular Ecology of Herbivory

(cross-leveled with PLNT_S 7970). The application of molecular biology tools to the rich history of chemical, physiological, population, and multi-trophic ecology studies on plant herbivore interactions has made for an exciting, fast-paced field at the forefront of ecology, 'functional biology' and 'systems biology'. Graded on S/U basis only.

Credit Hour: 1

PLNT_S 4975: Advanced Landscape Design

(cross-leveled with PLNT_S 7975). Development of project presentation techniques by analysis of the social, cultural, historical and ecological aspects of landscape design.

Credit Hours: 4

Prerequisites: PLNT_S 2254 or instructor's consent

PLNT_S 7001: Topics

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

Credit Hour: 1-4

PLNT_S 7085: Problems

Advanced studies not expected to terminate in thesis. Problems arranged with individual faculty member in specific matter area.

Credit Hour: 1-3

Prerequisites: instructor's consent

PLNT_S 7087: Seminar

In-depth development of advanced aspects of plant, insect, or microbial sciences through reviews of results of research in progress and current scientific publications. Graded on S/U basis only.

Credit Hour: 1

PLNT_S 7090: Nonthesis Research

Original investigation not leading to preparation of thesis.

Credit Hour: 1-9

PLNT_S 7313: Soil Fertility and Plant Nutrition

(same as SOIL 7313; cross-leveled with PLNT_S 4313, SOIL 4313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of soil amendments.

Credit Hours: 3

Prerequisites: SOIL 2110 or instructor's consent

PLNT_S 7314: Soil Fertility and Plant Nutrition Laboratory

(same as SOIL 7314; cross-leveled PLNT_S 4314, SOIL 4314). The application of elementary analytical procedures to the evaluation of the nutrient status of soils and crop plants.

Credit Hours: 2

Prerequisites: concurrent enrollment or previous completion of SOIL 4313 SOIL 7313

PLNT_S 7315: Crop Physiology

(cross-leveled with PLNT_S 4315). Basic course on crop growth and development. Emphasis is on physiological processes and morphology of crop plants, and their application to crop breeding and management decisions.

Credit Hours: 3

Prerequisites: PLNT_S 2125 or equivalent

PLNT_S 7320: Molecular Plant Physiology

(same as BIO_SC 7320; cross-leveled with PLNT_S 4320, BIO_SC 4320). Modern physiology of higher plants using common cultivated plants as examples. May be taken with or without laboratory.

Credit Hours: 3

Prerequisites: BIO_SC 1500 or BIO_SC 1200 and five hours of chemistry

PLNT_S 7325: Field Crop Breeding

(cross-leveled with PLNT_S 4325). Will introduce students to the application of genetics and the plant sciences to the breeding and improvement of self-pollinated field crops. Classical, current and innovative plant breeding techniques will be addressed.

Credit Hours: 3

Prerequisites: PLNT_S 2110 or PLNT_S 2125, and PLNT_S 3213 (or equivalent), and PLNT_S 3225 (or equivalent)

PLNT_S 7330: Plant Breeding Theory

(cross-leveled with PLNT_S 4330). Designed to provide a logical application of genetic concepts to mating and selection theory in general improvement of cross pollinated crops.

Credit Hours: 3

Prerequisites: PLNT_S 3225 or equivalent

PLNT_S 7345: Principles of Viticulture and Winemaking

(same as F_S 7345; cross-leveled with PLNT_S 4345, F_S 4345). This course will cover the basics needed by viticulturists and winemakers to understand grape vine growth and vineyard considerations along with winemaking principles. Viticultural topics will include grapevine growth and development, vineyard design and development, cultivar selection, grapevine propagation, training systems, and harvest and pruning. Winemaking topics will include sensory analysis of grapes, chemical, microbiological and technological aspects of winemaking, and the analytical methods used for juice and wine analysis. Graded on A-F basis only.

Credit Hours: 3

PLNT_S 7350: Readings

Individual study of assigned topics.

Credit Hour: 1-3

Prerequisites: instructor's consent

PLNT_S 7355: Advanced Turfgrass Management

(cross-leveled with PLNT_S 4355). Provides turfgrass majors a more informative and applicable look at mathematics of turfgrass management, application techniques, cultural practices, and soil/water relationships applicable to careers in golf course and sports turf management, lawn care, and professional grounds maintenance. Graded on A-F basis only.

Credit Hours: 3

Prerequisites: PLNT_S 3355 or instructor's consent

PLNT_S 7360: Precision Agriculture Science and Technology

(same as AG_S_M 7360 and SOIL 7360; cross-leveled with PLNT_S 4360, AG_S_M 4360, SOIL 7360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating decisions and management.

Credit Hours: 3

Prerequisites: SOIL 2100, PLNT_S 2110 or instructor's consent

PLNT_S 7365: Greenhouse Crops Production

(cross-leveled with PLNT_S 4365). Production management decision and commercial culture of the major floriculture crops.

Credit Hours: 4

Prerequisites: PLNT_S 3260 or instructor's consent

PLNT_S 7370: Small Fruit and Vegetable Production

Emphasizes production, management and marketing practices for small fruit and vegetable crops.

Credit Hours: 3

Prerequisites: PLNT_S 2100, PLNT_S 3230, and PLNT_S 3235

PLNT_S 7400: Plant Anatomy

(same as BIO_SC 7400; cross-leveled with PLNT_S 4400, BIO_SCI 4400). Comparative structure, growth of meristems; development, structure of important cell types, tissue systems; comparative anatomy of stem, root, leaf. Emphasized anatomy of gymnosperms, angiosperms. Includes lab. Graded on A-F basis only.

Credit Hours: 4

Prerequisites: BIO_SC 1200 or equivalent

PLNT_S 7500: Biology and Pathogenesis of Plant-Associated Microbes

(cross-leveled with PLNT_S 4500). Diagnosis of disease of plants caused by fungi, nematodes, viruses and bacteria. Environmental and genetic factors leading to disease development and strategies for disease management, including biotechnology.

Credit Hours: 4

Prerequisites: 5 hours BIO_SC

PLNT_S 7550: Plant Biotechnology

(cross-leveled with PLNT_S 4550). Principles of gene expression, metabolic pathway analysis and data mining, plant tissue culture and transformation, transgene integration and expression analysis, plant epigenome, emerging transgenic technologies, etc.

Credit Hours: 4

Prerequisites: BIO_SC 2960 or equivalent; BIO_SC 2200 or equivalent; BIO_SCI 2300 or equivalent; PLNT_S 2125

PLNT_S 7710: Systematic Entomology

(cross-leveled with PLNT_S 4710). Taxonomy of insects: emphasizes biology and classification of orders and suborders in lecture, and major families in lab. Insect collection required.

Credit Hours: 5

Prerequisites: PLNT_S 3710 and PLNT_S 3715 or 10 hours Biological Sciences

PLNT_S 7720: Aquatic Entomology

(cross-leveled with PLNT_S 4720). Identification, life histories, ecology of aquatic insects. Grading is based on lecture, lab, and a collection. For students of wildlife, fisheries management, aquatic biology, advanced entomology.

Credit Hours: 3

Prerequisites: PLNT_S 3710, PLNT_S 3715 or equivalent or instructor's consent

PLNT_S 7730: Insect Pest Management for Plant Protection

(cross-leveled with PLNT_S 4730). History and concepts of Integrated Pest Management for insects pests, emphasizing complementary use of biological control, plant resistance, environmental manipulations, genetic manipulations, and selective use of insecticides.

Credit Hours: 3

Prerequisites: PLNT_S 3710 or instructor's consent

PLNT_S 7820: Principles of Insect Physiology

Major concepts of insect physiology emphasizing functions of organ-systems sensory physiology hormones in development, nutrition.

Credit Hours: 4

Prerequisites: PLNT_S 3710, PLNT_S 3715 and PLNT_S 7810 or equivalent

PLNT_S 7965: Readings in Plant Stress Biology

Independent readings and discussion of recent research publications. Topics selected in consultation with supervisory faculty member.

Credit Hour: 1-9

Prerequisites: instructor's consent

PLNT_S 7970: Readings in Molecular Ecology of Herbivory

(cross-leveled with PLNT_S 4970). The application of molecular biology tools to the rich history of chemical, physiological, population, and multi-trophic ecology studies on plant herbivore interactions has made for an exciting, fast-paced field at the forefront of ecology, 'functional biology' and 'systems biology'. Graded on S/U basis only.

Credit Hour: 1

Prerequisites: Instructor's consent

PLNT_S 7975: Advanced Landscape Design

(cross-leveled with PLNT_S 4975). Development of project presentation techniques by analysis of the social, cultural, historical and ecological aspects of landscape design.

Credit Hours: 4

Prerequisites: PLNT_S 2254, instructor's consent

PLNT_S 8001: Topics

Instruction in specific subject matter areas in plant, insect or microbial sciences.

Credit Hour: 1-4

Prerequisites: instructor's consent

PLNT_S 8010: Professionalism and Ethics

Ethical issues in the conduct of scientific research including data integrity, plagiarism, and intellectual property. Scientific writing, lab management, peer review and other professional skills for the life sciences. Graded on A-F basis only.

Credit Hours: 2

PLNT_S 8090: Thesis Research

Original investigations in plant, insect or microbial science in support of thesis for master's candidates. Graded on S/U basis only.

Credit Hour: 1-10

PLNT_S 8330: Molecular Breeding

Development of Molecular Breeding, Evolution of Transgenics, Transformation and Gene Transfer Methods, Transgenics in the Food Supply Genetics and Marker Technology, Genotyping Methods for Marker Assisted Selection (MAS, and Emerging Transgenic and Genotyping Technologies. Graded on A-F basis only. Prerequisites: PLNT_S 3225

Credit Hours: 3

PLNT_S 8362: Introduction to Plant Metabolism

(same as BIO_SC 8362 and BIOCHM 8362). This course is part of a series that aims to provide a solid conceptual foundation in interdisciplinary plant biology for graduate students with a research emphasis in plant biology. This course examines the basic concepts and techniques used to understand plant metabolism. Graded on A-F basis only.

Credit Hours: 2

PLNT_S 8365: Introduction to Molecular Cell Biology

(same as BIOCHM 8365 and BIO_SC 8365). This course is part of a series that aims to provide a solid conceptual foundation in interdisciplinary plant biology for graduate students with a research emphasis on plant biology. This course examines the basic concepts and techniques used to understand molecular cell biology. Graded on A-F basis only.

Credit Hours: 2

PLNT_S 8410: Advanced Weed Science

Discussion of herbicide physiology and fate in the environment, current development in weed science theory and methodology, and application of analytical procedures in weed research.

Credit Hours: 3

Prerequisites: PLNT_S 3210

PLNT_S 8420: Herbicide Mode of Action and Symptomology

Designed for graduate students to gain an understanding of the in-depth processes by which herbicides interrupt normal plant growth and development at a tissue, cellular, and enzymatic level while learning to diagnose visual symptoms associated with herbicide injury. Course maybe repeated for credit. Graded on A-F basis.

Credit Hours: 2

Prerequisites: PLNT_S 3210; instructor's consent

PLNT_S 8430: Introduction to Bioinformatics Programming

(same as AN_SCI 8430). This course provides the basics of programming and database development to students in the life sciences who have little prior programming experience. It covers Unix/Linux, Perl, MySQL, the relational database design process, and common data formats used in genome informatics. Students will learn how programming skills can enhance their ability to analyze large biological datasets, and will gain hands on experience with examples focused on genomics and bioinformatics. Graded on A-F basis only.

Credit Hours: 4

Prerequisites: Instructor's consent

Recommended: Undergraduate or graduate course in Genetics

PLNT_S 8505: Introduction to Plant Stress Biology

(same as BIO_SC 8505) This course is part of a series that aims to provide a solid conceptual foundation to interdisciplinary plant biology for graduate students with a research emphasis in plant biology. This course examines the basic concepts and techniques used to understand plant stress biology. Graded on A-F basis only.

Credit Hours: 2

PLNT_S 8530: Research with Plant Stress Agents

Students will learn key research strategies for abiotic and biotic plant stress agents. Students will complete two focused hands-on projects. Graded on A-F basis only.

Credit Hours: 3

Prerequisites: PLNT_S 7500 and PLNT_S 7510 or PLNT_S 7315, or PLNT_S 7320, or equivalent

PLNT_S 8650: Ecological and Evolutionary Genomics

(same as BIO_SC 8650). This course is designed to give a background in evolution and then explore an exciting new field: Ecological and evolutionary genomics. We will study genes that affect fitness and how whole genomes evolve. Graded on A-F basis only.

Credit Hours: 2

PLNT_S 8720: Insect Behavior

An examination of the breadth of behaviors found in insects, such as orientation mechanisms, communication, dispersal and migration, defensive mechanisms, lost location, feeding strategies, pollination, courtship and reproduction, and social behavior.

Credit Hours: 3

Prerequisites: PLNT_S 3710 and PLNT_S 3715 or 10 hours of Biological Sciences

PLNT_S 9001: Topics

Instruction in specific subject matter areas in plant, insect or microbial sciences.

Credit Hour: 1-4

Prerequisites: instructor's consent

PLNT_S 9087: Seminar in Plant Science

In-depth development of advanced aspects of plant, insect and microbial sciences through reviews of results of research in progress and current scientific publications. Graded on A-F or S/U basis dependent on section.

Credit Hour: 1

PLNT_S 9090: Dissertation Research

Original investigations in plant, insect or microbial science in support of dissertation for doctoral candidates. Graded on a S/U basis only.

Credit Hour: 1-10

PLNT_S 9310: Ecology of Grazing Lands Systems

Students travel to grazing lands ecosystems to learn: the components and function of grazing lands; research techniques in soil-plant-animal research; forage-livestock ecology; and the role of forages in conservation practices, wildlife habitat, and sustainable agriculture.

Credit Hours: 3

Prerequisites: instructor's consent

PLNT_S 9415: Advanced Plant Physiology

Advanced course in the physiology of plant growth and development. Discussion of current and classical studies in plant physiology with emphasis on responses to environmental variation.

Credit Hour: 1-3

Prerequisites: PLNT_S 4315 or PLNT_S 4320 or equivalent. Instructor's consent required

PLNT_S 9440: Applied Quantitative and Statistical Genetics

Estimation of genetic effects using means and variances, diallel analysis, environmental stability responses, index selection, and gain from selection.

Credit Hours: 3

Prerequisites: PLNT_S 4330, STAT 4510, STAT 4530, AN_SCI 9423, or equivalent

PLNT_S 9540: Genetics of Plant-Microorganism Interaction

Molecular and general genetics of the interactions between plants and pathogenic or symbiotic microorganisms.

Credit Hours: 3

Prerequisites: PLNT_S 7500 and PLNT_S 7510, one course each in Biochemistry and Genetics

PLNT_S 9810: Insect Ecology

Ecological aspects of insect populations and communities including population dynamics, predator-prey interactions, competition, diversity and stability. Quantitative methods are emphasized.

Credit Hours: 3

Prerequisites: PLNT_S 3710 and PLNT_S 3715, STAT 1400 and BIO_SC 3650 or instructor's consent
