Agronomy Courses

Undergraduate Level/Lower-Division Courses

AGRY 10500 - Crop Production Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Fall Spring.

AGRY 12000 - Water And Food Security Credit Hours: 3.00. General science introduction to global and regional water resources issues, especially with respect to food security. It will address the role of water in agriculture throughout the world and agriculture's impact on water resources. Students will focus first on developing the scientific underpinnings of water supply and crop water use. With this background, they will explore key issues relating to water scarcity and balancing agricultural and urban demands for water, water quality and soil salinization, water footprints of food and the use of virtual water embedded in food to offset national water deficits, regulation and roles science and policy in solving water problems. Typically offered Fall Spring.

AGRY 12300 - Genetics And Society Credit Hours: 3.00. Introduction to the broad impacts that genetics and genomics have on society, from medicine, genetic testing and DNA evidence to agriculture, genetically modified crops and synthetic life. Background information is provided on a weekly topic followed by extensive in-class discussion. Typically offered Fall.

AGRY 12500 - Environmental Science And Conservation Credit Hours: 3.00. (EAPS 12500, FNR 12500, NRES 12500) Introduction to environmental science and conservation includes topics in ecological principles, conservation and natural resource management, human impacts on the environment, toxic waste disposal, climate change, energy, air and water pollution, environmental geology and geologic hazards. Typically offered Fall Spring.

AGRY 15500 - Introduction To Soil Morphology Credit Hours: 2.00. This course features an introductory field experience in evaluating soil morphology. Students will develop skills determining horizon nomenclature, texture, soil color, structure, consistence and drainage. Basic concepts regarding the impact of soil morphology on use of soils for various purposes will be presented. Collegiate soil judging is a portion of the subject matter discussed. Typically offered Fall.

AGRY 21000 - Fundamentals Of Turfgrass Culture Credit Hours: 3.00. (HORT 21000) An introductory course in turfgrass management emphasizing turfgrass growth and development, species characteristics, their adaptation and basic cultural requirements for ornamental and functional turfgrass areas. The requirements and cultural inputs needed for proper

establishment and maintenance of a high quality, low maintenance lawn will be discussed. Typically offered Spring.

AGRY 21100 - Fundamentals Of Turfgrass Culture Laboratory Credit Hours: 1.00. (HORT 21100) Companion lab to AGRY 21000. Laboratory exercises will focus on turfgrass and seed anatomy, morphology, identification as well as the hands-on basic principles of turfgrass culture. Designed for the student who intends to pursue a career in turfgrass management and plans to enroll in AGRY 51000. Enrollment preference will be given to Turfgrass Science Majors. Typically offered Spring.

AGRY 25100 - Introduction To Soils Credit Hours: 1.00. Characteristics of soils and associated landscapes; soil genesis and classification; relation of soils to land use; soil management relative to erosion, tillage, drainage, moisture supply, and aeration. Credit cannot be given in both AGRY 25100 and AGRY 25500/NRES 25500 or AGRY 27000. Course meets during weeks 1-6. Typically offered Fall Spring.

AGRY 25500 - Soil Science Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring.

AGRY 27000 - Forest Soils Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices; nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring.

AGRY 27500 - Honors Course - Lower Division Credit Hours: 1.00 to 4.00. Utilized to offer a new honors course for a maximum of three years. Variable title, credit, and instructional type. Course may be repeated for credit if content and titles are different. Offered primarily to first- and second-year students. Courses offered must be approved by departmental or program faculty and College of Agriculture Honors Committee. Permission of instructor required. Typically offered Fall Spring Summer.

AGRY 28500 - World Crop Adaptation And Distribution Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of

food crops in agricultural communities and how his intervention has affected the environment. Typically offered Spring.

Undergraduate Level/Upper-Division Courses

AGRY 32000 – Genetics Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring Summer.

AGRY 32100 - Genetics Laboratory Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring.

AGRY 33500 - Weather And Climate Credit Hours: 3.00. An introductory course in meteorology and climatology with applications to daily life. The study of the fundamental physical principles behind weather and climate and how they apply to the homeowner and the world citizen. Emphasis is on how to interpret weather conditions and forecasts, what controls the wide range of climates in the world, and what the future may hold. Typically offered Spring.

AGRY 33700 - Environmental Hydrology Credit Hours: 3.00. This course is designed to provide undergraduate students with both the basics of how water moves through the environment and current theories as to how hydrologic response is modified by environmental change at a variety of temporal and spatial scales. Typically offered Spring.

AGRY 33800 - Environmental Hydrology Laboratory Credit Hours: 1.00. This laboratory course is designed to provide hands-on examples of the hydrologic concepts covered in the AGRY 33700 Environmental Hydrology class and with practical experience in hydrologic field techniques. Typically offered Spring.

AGRY 34900 - Soil Ecology Credit Hours: 3.00. An introductory course that will cover the basic concepts of soil ecology. Biological diversity and the interactions between and within biotic and abiotic components of the soil ecosystem, nutrient cycling, and genetic engineering are introduced. Typically offered Fall.

AGRY 35000 - Global Awareness Credit Hours: 1.00 to 3.00. A seminar-type course about world geography, cultures, and agriculture. Speakers are selected from the many Purdue graduate students and visiting scholars from around the world. Extra credit may be earned through independent study of a global issue. Typically offered Spring. May be repeated for a maximum of 4 credits

AGRY 35500 - Soil Morphology And Geography Credit Hours: 2.00. This course features field experience in advanced techniques in soil morphology including the study of the relationship of soils to landscaped, common parent materials of Midwest and classification of soils in the Soil

Taxonomy. Course material emphasizes the development of detailed descriptions of soil properties and how these properties directly impact the interpretations and recommendations for land use options. Use and management of soils based on landscape position and morphology will be covered including on-site waste disposal, homes with basements as well as road and street construction. Collegiate soil judging is a portion of the subject matter discussed. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall. May be repeated up to 1 times

AGRY 36500 - Soil Fertility Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring.

AGRY 37500 - Crop Production Systems Credit Hours: 3.00. Factors affecting management decisions in crop production systems. Development of small grain and row cropping systems. Interaction of factors affecting efficient production systems, including seed selection, tillage, planting management, pest management, and harvesting and storage considerations. Typically offered Fall Spring.

AGRY 38500 - Environmental Soil Chemistry Credit Hours: 4.00. (NRES 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or math background. (el.5). Typically offered Fall.

AGRY 39000 - Professional Cooperative Programs In Agronomy Credit Hours: 0.00. Supervised professional experiences in agronomy. Programs must be preplanned and conducted under the direction of the departmental coordinator with the cooperation of an employer. Students must submit a summary report. Consent of the departmental cooperative professional program coordinator required. Typically offered Fall Spring Summer. May be repeated an unlimited number of times

AGRY 39800 - Agronomy Seminar Credit Hours: 1.00. Weekly discussions of agronomic topics and other subjects relative to agronomic interest. Students are expected to participate in the discussions. Typically offered Fall.

AGRY 39900 - Individual Study Credit Hours: 1.00 to 3.00. Supervised individual study or research over topics not covered in other courses. Arrange with agronomy faculty before

registering. Permission of instructor required. Typically offered Fall Spring. May be repeated for a maximum of 6 credits

AGRY 40000 - Agronomy Study Abroad Credit Hours: 0.00 to 8.00. Utilized to record credits earned through participation in Purdue study abroad programs with cooperating foreign universities. Typically offered Fall Spring Summer. May be repeated for a maximum of 8 credits

AGRY 43100 - Atmospheric Thermodynamics Credit Hours: 3.00. (EAPS 42100) Structure and composition of the atmosphere. Thermodynamics of dry and moist air, including adiabatic and pseudoadiabatic processes, hydrostatic stability, and air mass determination. Typically offered Fall.

AGRY 43200 - Atmospheric Dynamics I Credit Hours: 3.00. (EAPS 42200) A study of the general system of equations governing mass and momentum changes in the atmosphere; special horizontal wind representations; thermal wind relationships; circulation, vorticity, divergence, and vertical motion. Typically offered Spring.

AGRY 43300 - Atmospheric Dynamics II Credit Hours: 3.00. (EAPS 42300) An extension of AGRY 43200 with the emphasis on perturbation theory and hydrodynamic stability, air mass and frontal theory, barotrophic and baroclinic models, wave cyclone theory, and numerical weather prediction. Typically offered Fall.

AGRY 44100 - Synoptic Laboratory I Credit Hours: 1.00. (EAPS 43100) Analysis of vertical distributions of temperature and moisture with applications to adiabatic and pseudoadiabatic processes, hydrostatic stability, and air mass determination. Typically offered Fall.

AGRY 44200 - Synoptic Laboratory II Credit Hours: 1.00. (EAPS 43200) Analysis of horizontal distributions of pressure, temperature, wind, vorticity, and vertical motions. Applications to synoptic scale wave propagation. Typically offered Spring.

AGRY 44300 - Synoptic Laboratory III Credit Hours: 1.00. (EAPS 43300) Diagnosis of midtropospheric wave propagation and growth. Analysis of surface pressure fields and fronts and their relationships to upper air features. Extensive use is made of teletype and facsimile weather information. Typically offered Fall.

AGRY 44400 - Weather Analysis And Forecasting Credit Hours: 3.00. (EAPS 43400) In-depth study of contemporary weather analysis and forecasting techniques and problems. Extensive use is made of teletype and facsimile data and numerical weather prediction guidance provided by the National Meteorological Center. Typically offered Spring.

AGRY 45000 - Soil Conservation and Water Management Credit Hours: 3.00. (NRES 45000) Principles of soil conservation with emphasis on control of soil erosion by wind and water; impact of soil management decisions on environment; soil-water-plant relations, includes

agronomic aspects of water management for both irrigation and drainage. Typically offered Fall.

AGRY 46500 - Soil Physical Properties Credit Hours: 3.00. Physical properties and processes in soils; water flow, soil structure, chemical movement; principles and methods of physical analysis of soils; the influence of soil physical processes on environmental quality and plant growth. Typically offered Fall.

AGRY 47500 - Honors Course - Upper Division Credit Hours: 1.00 to 4.00. Utilized to offer a new honors course for a maximum of three years. Variable title, credit, and instructional type. Course may be repeated for credit if content and titles are different. Offered primarily to third- and fourth-year students. Courses offered must be approved by departmental or program faculty and College of Agriculture Honors Committee. Permission of instructor required. Typically offered Fall Spring Summer. May be repeated an unlimited number of times

AGRY 48000 - Plant Genetics Credit Hours: 3.00. Principles and recent advances in plant genetics including: genetic segregation, linkage, DNA markers and applications, chromosomes and genomes, variation in chromosome number and structure, mutation, recombination and DNA repair, quantitatively inherited traits, introduction to principles of population genetics, gene expression, gene organization, regulation of gene activity, gene function, identifying important genes, cloning genes, reverse genetics, plant transformation, applications of genetic engineering, genome sequencing, using sequence data. Typically offered Fall.

AGRY 48500 - Precision Crop Management Credit Hours: 3.00. An experiential lecture, discussion and field laboratory course for graduating seniors majoring in Agronomy. Analysis of multi-layer digital georeferenced crop data is used to inform the development and evaluation of zone-specific agronomic input prescriptions. Variables include factors affecting soil productivity, soil fertility and N management (including emerging sensor and crop modeling technologies). Prescriptions for variable crop genetics and seeding rates are also discussed. Sound agronomic use of emerging technologies such as real time soil moisture, organic matter, temperature and moisture sensing to affect variable seeding depth, rate and precision are included. May be used in combination with AGRY 49800 to meet the Agronomy undergraduate capstone requirement; will also meet the GIS/GPS requirement in Agronomy plans of study. Typically offered Fall.

AGRY 49800 - Agronomy Senior Seminar Credit Hours: 1.00. Weekly discussions and presentations on assigned topics in Agronomy, interpersonal interactions, professional ethics, and leadership skills. Student teams will evaluate case studies and present their analysis orally and in writing. Typically offered Fall.

AGRY 49900 - Thesis Research Credit Hours: 1.00 to 6.00. For students doing individualized research on agronomic problems; report required. Arrange with academic advisor and honors

research advisor before registering. Admission to honors program. Permission of instructor required. Typically offered Fall Spring Summer. May be repeated for a maximum of 6 credits

Dual Level/Undergraduate-Graduate

AGRY 50500 - Forage Management Credit Hours: 3.00. The study of the role of economically important crop species in the soil-plant-animal complex. Physiology, utilization, and management of forage species will be emphasized. Typically offered Spring.

AGRY 51000 - Turfgrass Science Credit Hours: 3.00. An advanced course in turfgrass management which focuses on the management requirements of intensively cultured turfgrass areas, with a specific emphasis on golf course and athletic fields. Interrelationships among soil, plant and atmospheric environments, management practices and turfgrass quality will be stressed. Typically offered Fall.

AGRY 51100 - Population Genetics Credit Hours: 3.00. (ANSC 51100, FNR 51100) Basic concepts of population genetics. Characterization of populations using gene frequencies, gametic and zygotic disequilibrium; forces changing gene frequencies (mutation, migration, selection, and random genetic drift) and genotypic frequencies (mating systems: inbreeding, crossbreeding, and phenotypic assortative) and related hypothesis testing; gene trees and the coalescent process; and molecular phylogenies. Typically offered Fall.

AGRY 51200 - Integrated Turfgrass Systems Credit Hours: 3.00. Integration of agronomic principles for professionally managing golf courses, athletic complexes, lawn care companies, and sod production facilities in an efficient and environmentally friendly manner. Emphasizes independent thinking and team cooperation for understanding the social, ethical, and economical aspects underlying the daily agronomic management decisions, including construction, establishment, cultural practices, fertilization, and pest management. Course meets for weeks 1-10. Typically offered Fall.

AGRY 51400 - Environmental Stress Management For Turfgrass Credit Hours: 1.00. Designed for students who desire an understanding of how environmental stresses influence turfgrass growth and how they can be managed with cultural practices. The course covers current research findings in stress management and integrates turfgrass environmental physiology with turfgrass management. Typically offered Fall.

AGRY 51500 - Plant Mineral Nutrition Credit Hours: 3.00. Fundamental principles and concepts of the mineral nutrition of higher plants; processes and mechanisms controlling nutrient bioavailability and acquisition; physiological, genetic, and ecological aspects of plant nutrition including rhizosphere dynamics and interaction with disease. Offered in even-numbered years. Typically offered Fall.

AGRY 51800 - Plant Physiology And Biotechnology Research Techniques Credit Hours: 3.00. This course has two components. The physiology section covers some of the popular

experiments, such as the measurement of water potential, photosynthesis, stomata density, carbohydrate content, enzyme activity, mineral deficiency, drought stress physiology, plant pigment analysis, etc. The biotechnology section guides students through the entire procedure of genetic engineering, culminating in a project that will serve as an example on how to use molecular tools to answer fundamental physiological questions. Typically offered Spring.

AGRY 52000 - Principles And Methods Of Plant Breeding Credit Hours: 3.00. Introduction to methods and techniques of breeding field crops, with emphasis on the application of genetic principles; analysis of and present approach to the solution of specific breeding problems in selected field crops. Typically offered Fall.

AGRY 52500 - Crop Physiology And Ecology Credit Hours: 3.00. Study of the physiological basis for growth, yield, and adaptation of crop plants. Topics emphasized include: carbohydrate assimilation and partitioning, nitrogen metabolism, crop growth and development, water relations, stress tolerance, and crop improvement using physiological genetics. Basic background in college level plant biology is recommended. Typically offered Spring.

AGRY 53000 - Advanced Plant Genetics Credit Hours: 3.00. Advanced treatment of principles and recent advances in plant genetics including: mutagenesis; cell, molecular and direct approaches to genetic analysis and genetic interactions; haploidy; chromosomal organization and aberrations; transposable elements; mutations, para-mutation and epigenetics in higher plants; extra nuclear inheritance; cytogenetic and molecular affinities between crop plants and their wild relatives; genetic manipulations; gene discovery; genetic approaches to understanding agriculturally useful plant traits. ESTs and global gene expression analysis, proteomics, metabolic profiling, comparative genomics and genome evolution. Offered in odd-numbered years. Typically offered Fall.

AGRY 53500 - Boundary Layer Meteorology Credit Hours: 3.00. (EASP 52500) This course has required class trips. Students will pay individual lodging or meal expenses where necessary. A study of the physical nature of the lowest layers of the atmosphere. The energy balance concept and the turbulent transfer of heat, momentum, and water vapor are discussed in detail. Some specific microclimates are studied in this context. Typically offered Spring.

AGRY 53600 - Environmental Biophysics Credit Hours: 3.00. An analysis of the energy fluxes to and from terrestrial plants, insects, mammals, and humans as they exist in their macro and microclimates. Agricultural meteorology methods (both research and operational) will be presented. Labs will be both in-laboratory and in-field with reports required. A special project

will be required of all students and will be presented in class and written as if for publication. Typically offered Spring.

AGRY 54000 - Soil Chemistry Credit Hours: 3.00. Emphasis on processes controlling the gaseous, solution, and solid phases in soils including precipitation, acid-base, oxidation-reduction, complexation, absorption, and ion exchange. Typically offered Spring.

AGRY 54400 - Environmental Organic Chemistry Credit Hours: 3.00. The fundamental properties and processes responsible for the fate of organic chemicals in the environment, with emphasis on soil and water chemistry. Areas to be addressed will include both conceptual and theoretical aspects of processes relevant to environmental fate of contaminants; measurement, estimation, correlation, and application of the parameters most commonly used to assess various chemodynamic properties in soil-water systems. Typically offered in spring semester of even-numbered years.

AGRY 54500 - Remote Sensing Of Land Resources Credit Hours: 3.00. Application of remote sensing and spatial databases for observing and managing land resources within the Earth System; analysis and interpretation of remotely sensed data in combination with field observations and other data sources; conceptualization and design of a global earth resources information system. Typically offered Fall.

AGRY 55000 - Field Crops Breeding Techniques Credit Hours: 2.00. Field nursery experience, including crossing procedures, plant evaluation, selection for pest resistance and for agronomic characters, and field data evaluation. Typically offered Summer.

AGRY 55500 - Soil And Plant Analysis Credit Hours: 3.00. Principles and methods of chemical analysis of plants and soils. Topics include soil carbon analysis, exchangeable cations, soil acidity, salinity, pesticide analysis, and elemental analysis of plant tissue and forage analysis. Quantitative gravimetric and volumetric techniques are reviewed followed by use of instrumental methods of analysis including atomic absorption, UV/Visible spectrometry, HPLC, and gas chromatography. Laboratory safety, quality assurance/quality control, and data reporting are emphasized. Students having at lease one year of chemistry including a quantitative analysis laboratory will be suitably prepared. Typically offered Spring.

AGRY 56000 - Soil Physics Credit Hours: 3.00. Fundamentals of soil physics; transport of chemicals, heat, and gases; field spatial variability; principles and methods of physical analysis of soils; the influence of soil physical processes on environmental quality and agricultural production. Students having an understanding of introductory soil science will be suitably prepared. Typically offered Fall.

AGRY 56500 - Soils And Landscapes Credit Hours: 3.00. Soils as natural components of landscapes, geomorphology and soil characteristics; processes of soil formation; principal soils of Indiana, their adaptations, limitations, productivity and use; global soil distributions;

application of GPS and mobile GIS in the field. This course requires two all-day field trips. Students will pay individual meal expenses when necessary. Typically offered Fall.

AGRY 58000 - Soil Microbiology Credit Hours: 3.00. The soil microbial population and its role in the soil ecosystem; microbial transformations of inorganic and organic compounds; decomposition of residues; and dynamics of soil organic matter. Typically offered Spring.

AGRY 58200 - Environmental Fate Of Pesticides Credit Hours: 3.00. Emphasis is given to developing a fundamental understanding of the processes controlling the fate of organic chemicals, such as pesticides, in the environment. Processes considered include: volatilization, degradation, leaching, and sorption. Typically offered Spring.

AGRY 58500 - Soils And Land Use Credit Hours: 3.00. Soils as a resource in development planning; soil properties affecting land use; use of soil survey, aerial photos, topographic maps, and other resource data in land-use allocation; nonengineering aspects of site selection for various land uses, water conservation, waste disposal, and erosion control. Typically offered Spring.

AGRY 59600 - Professional Presentations Credit Hours: 1.00. Develop confidence and skills in preparing and delivering professional presentations to both peer scientific and student audiences. (el. 7). Typically offered Fall.

AGRY 59700 - Communicating With The Public Credit Hours: 1.00. This course will prepare students being trained as agronomy professionals to enhance their communication skills so they can successfully interact with the public. (el. 7) Offered in alternate years. Typically offered Spring.

AGRY 59800 - Special Problems Credit Hours: 1.00 to 6.00. Research on agronomic problems conducted in laboratory, field, or library; report required; arrange with an agronomy staff member before registering. Permission of instructor required. Typically offered Fall Spring Summer. May be repeated an unlimited number of times

Graduate Level Course

AGRY 60000 – Genomics Credit Hours: 3.00. An introduction to the technologies and analytical methods used in studying genomes, their functions and systems biology. This course prepares graduate students for further study of these techniques in additional courses and in their research. Students with an understanding of introductory genetics and statistics will be suitably prepared for this course. Offered in even-numbered years. Typically offered Fall.

AGRY 60500 - Advanced Plant Breeding Credit Hours: 3.00. Advanced study of genetic principles and their application to plant breeding systems, techniques, and objectives. Offered

in alternate years. Prerequisite: AGRY 52000; a course in statistics covering simple analysis of variance. Typically offered Spring.

AGRY 61100 - Quantitative Genetics Credit Hours: 3.00. Continuation of AGRY (ANSC) 511. Quantitative genetics in animals and plants. Genotypic and environmental variances; covariances between relatives; single- and multiple-trait selection and correlated responses; genotype-environment interaction. Inbreeding and crossbreeding: means, variances, heterosis, intra- and inter-population improvement. Prerequisite: STAT 51200; Prerequisite: AGRY 51100 OR ANSC 51100. Typically offered Fall.

AGRY 62400 - Plant Ecophysiology Credit Hours: 3.00. This course will explore the influence of the environment on growth and development, reproduction, adaptation, survival and evolution of plants. The fundamental study of physiological mechanisms underlying adaptive strategies and their ecological consequences will be included. Prerequisites: Undergraduate or graduate level of Plant Physiology (HORT 30100 or AGRY 52500 or HORT 55100 or FNR 43400 or equivalent). Typically offered Fall.

AGRY 63500 – Micrometeorology Credit Hours: 3.00. A rigorous study of the atmospheric boundary layer with special attention to turbulent diffusion processes in the lower atmosphere. Offered in alternate years. Prerequisite: AGRY 53500. Typically offered Spring.

AGRY 64100 - Statistical Hydrology Credit Hours: 3.00. This course is designed to serve as an advanced graduate course in the statistical analysis of hydrologic data, including time series analysis and modeling, frequency analysis and uncertainty. Prerequisites: AGRY 33700 or CE 54200 or ABE 32500 and STAT 51100 or STAT 50300. Typically offered Fall.

AGRY 64900 - Molecular Microbial Ecology Credit Hours: 3.00. Focuses on the application of various molecular genetic techniques for studying micro-organisms from and in the environment. The method, theoretical basis of each method, and interpretation of results are covered. The major areas discussed are the application of molecular genetic techniques to study: (1) total microbial communities; (2) diversity of micro-organisms in a community; and (3) biotechnological uses of micro-organisms. Prerequisite: AGRY 32000 or 58000 or BCHM 56200 or BIOL 24100 or 43800 or 54900. Typically offered Fall.

AGRY 65000 - Clay Mineralogy Credit Hours: 4.00. Principles of crystal chemistry, survey of clay mineral structures, and identification of clay minerals by X-ray diffraction, chemical methods, differential thermal analysis, infrared spectroscopy, and specific surface area measurements.

Role of clay minerals in the natural environment. Offered in alternate years. Typically offered Spring.

AGRY 69600 - Agronomy Graduate Seminar Credit Hours: 1.00. Weekly discussion of assigned topics in soil and crop science. Typically offered Spring. May be repeated up to 3 times

AGRY 69800 - Research MS Thesis Credit Hours: 1.00 to 18.00. Research MS Thesis. Permission of instructor required. Typically offered Fall Spring Summer. May be repeated an unlimited number of times

AGRY 69900 - Research PhD Thesis Credit Hours: 1.00 to 18.00. Research PhD Thesis. Permission of instructor required. Typically offered Fall Spring Summer. May be repeated an unlimited number of times