31 January 2008

To: Sandra Williams  
Assoc. Director-Curricula Services

Thru: Gene Nelson  
Exec. Associate Dean-COALS

Thru: David Reed  
Professor-Chair of GPC

Thru: David Baltensperger  
Professor and Head-SCSC

From: Wayne Smith  
Professor and Associate Head-SCSC

Subject: Graduate course prefix change

The Department of Soil and Crop Sciences request that the prefix for all graduate courses (see attached and to include the proposed courses listed below) within the Department be changed from AGRO to SCSC. The reason for the change is so that our course prefix will reflect our Department name. We request that this action be effective with the immediate catalog following approval.

New graduate courses:

- AGRO 613 Ethics International Agri Systems Approved 08C
- AGRO 620 Brazil Agri & Food Prod Approved 08C
- AGRO 637 Environmental Microbiology IP
- AGRO 657 Environmental Soil Science Approved 08C
- AGRO 660 Experimental Designs in Agri IP
- AGRO 671 Plant Growth & Development IP
Course Descriptions

Department of Soil and Crop Sciences

J. Aitkenhead-Peterson, D. H. Bade, D. D. Baltensperger (Head),
T. A. Baughman, P. A. Baumann, F. J. Betran, J. M. Blumenthal, N. E. Borlaug,
J. T. Cothren, H. T. Cralle, J. B. Dixon, K. C. Donnelly, M. C. Dozier, R. L. Duble,
M. C. Engelke, G. W. Evers, S. Feagley, C. J. Fernandez, S. A. Finlayson,
J. R. Gannaway, T. J. Gentry, T. J. Gerik, V. A. Haby, S. Hague, C. T. Hallmark,
B. L. Harris, G. E. Hart, D. B. Hays, J. L. Heilman, F. M. Hons, L. R. Hossner,
M. A. Hussey, W. R. Jordan, R. J. Kohel, R. J. Lascano, R. H. Loeffert, Jr.,
J. E. Matocha, G. N. McCauley, M. L. McFarland, K. J. McInnes, M. Menz,
M. H. Milford, S. Miyamoto, J. Moore, C. L. Morgan, G. D. Morgan, P. W. Morgan,
L. R. Nelson, W. R. Ocupmaugh, G. C. Peterson, K. S. Rathore, J. C. Read,
E. C. A. Runge, A. M. Schubert, S. A. Senseman, J. W. Sij, Jr., C. E. Simpson,
D. M. Stelly, L. Tarpley, F. T. Turner, D. M. Vietor, R. W. Weaver, R. H. White,
R. P. Wiedenfeld, L. P. Wilding, H. Zhang, D. A. Zuberer

* Graduate Advisor

The graduate programs of the Department of Soil and Crop Sciences are designed to prepare individuals for careers in research, teaching, extension and industry, and management of agronomic enterprises. Agronomy, food science and technology, genetics, molecular and environmental plant sciences, plant breeding and soil science are majors available to students.

Programs of study leading to a Master of Agriculture degree in Agronomy prepare students for professional careers in the agricultural industry. Research oriented programs in agronomy, food science and technology, genetics, plant breeding, molecular and environmental plant sciences and soil science lead to the MS or PhD degree in these fields. There is no language requirement at the MS or PhD level. Members of the faculty have expertise in cereal chemistry, crop breeding, crop physiology, environmental agronomy, cytogenetics, plant physiology, protein chemistry, environmental soil science, soil chemistry, soil fertility, soil genesis and classification, soil microbiology, soil mineralogy, soil physics, soil-plant-water relations, turfgrass science and weed science. Recipients of the MS and PhD degrees may obtain a research-, teaching- or extension-oriented position upon graduation.

Multidisciplinary programs can be arranged with other academic departments in the University. The facilities of the Electron Microscopy and Real Estate Research Centers are accessible, as are those of the Texas Water Resources Institute and the Department of Statistics.

Agronomy
(AGRO)

Modern concepts and recent developments for advanced students in plant and soil sciences and related fields employing microscopic evaluation; specimen preparation, stain technology, theory and use of microscopes, micromanipulators. microtomes. the microtome crvostat. use of equipmnet in
605. Pedology. (3-0). Credit 3.
Soil genesis, morphology and classification; development of a working knowledge of soil taxonomy and diagnostic horizons used in placement of soils. Prerequisites: AGRO 301 or equivalent; or approval of instructor. Two 2-day field trips for which departmental fees may be assessed to cover costs.

Mineralogical methods suitable for soil genesis, micromorphology and reconstruction analysis; application of thin section analysis and x-ray spectroscopy to soil reconstruction; soil variability, sample collection, fractionation and pretreatment of samples for soil matrices. Offered in alternate years. Prerequisites: AGRO 301 and 310.

607. Crop Physiology. (3-0). Credit 3.
Growth and productivity of major agronomic crops as related to plant physiological processes and environmental parameters, including manipulation of crop growth for enhanced production. Prerequisites: AGRO 303; MEPS 313.

608. International Agronomic Development. (2-0). Credit 2.
Overview of world food situation; role of assistance programs and international and national research centers in the development of viable agronomic research and outreach programs for the Third World; roles and importance in training programs for institutional development and service.

609. Integrated Farming Systems. (3-0). Credit 3.
System-oriented course that stimulates critical thinking and debate regarding the strength and weakness of modern crop and livestock production systems within the context of ecological and economic sustainability; evaluates conservation tillage, integrated nutrient and pest management and multiple cropping systems. Prerequisite: Approval of instructor.

610. Host Plant Resistance. (3-0). Credit 3.
Host plant resistance programs from the standpoint of the plant breeder, plant pathologist and entomologist; team taught with each discipline represented; roundtable discussion of assigned readings and lectures. Prerequisite: Approval of instructor. Cross-listed with ENTO 610 and PLPA 610.

611. Introduction to Environmental Biophysics. (3-2). Credit 4.
Theoretical and experimental analysis of interactions between living organisms and their environments; measurement and modeling of the physical environment; measurement and modeling of energy and mass transfer between organisms and their environments, and of organism response to fluxes of mass and energy. Prerequisites: Graduate classification and approval of instructor.

612. Forage Crops Management. (3-0). Credit 3.
Forage plant development, population dynamics and growth behavior patterns; applications of ecological and physiological principles to forage management; principles and practices of forage crops investigations; current literature and concepts. Prerequisite: AGRO 308 or approval of instructor.

614. Biodegradation and Bioremediation. (3-0). Credit 3.
Processes affecting the biodegradation of organic chemicals in the environment; assessment of the utility of various remedial procedures, including biodegradation and bioremediation; in site specific situations. Prerequisite: Organic chemistry. Cross-listed with VIBS 614.

615. Reclamation of Drastically Disturbed Lands. (3-0). Credit 3.
Theoretical and practical aspects of reclamation of lands disturbed during mining of lignite, uranium, phosphorous, oil shale and other minerals and disturbances due to industrial activities; emphasis on physical and chemical characteristics of disturbed materials and their impact on establishment of permanent vegetation. Prerequisite: AGRO 301 or approval of instructor.
616. Land Disposal of Waste. (3-0). Credit 3.
Theoretical, regulatory and practical aspects of disposal of municipal garbage, 
sewage effluent, sewage sludge, industrial and hazardous wastes by land 
treatment and landfilling; clean up of soil resources contaminated by past waste 
disposal activities will be considered. Prerequisite: Two courses in soils or 
approval of instructor.

Physical properties of soil; dynamics of soil, water and ion movement, soil 
aeration and soil thermal relationships. Prerequisites: AGRO 445 or equivalent, a 
two-semester course in physics, and one semester of calculus. (Offered in 
alternate years.)

Fundamental procedures for analysis of soils and sediments including chemical, 
spectrophotometric, electrophoretic, chromatographic and sample handling; 
methods important to the soils researcher and analyst. Prerequisite: AGRO 422 
or approval or instructor.

Underlying principles of molecular methods for microbial detection and 
characterization in natural and man-made ecosystems; emphasis on method 
application and data interpretation; emphasis on microbial pathogens and 
indicator organisms in foods and environment; laboratory covers select 
protocols. Prerequisites: AGRO 405; FSTC 326; POSC 429; approval of 
instructor. Cross-listed with FSTC 619, POSC 619, VTMI 619.

624. Physical Chemistry of Soils. (3-3). Credit 4.
Physical chemistry of clay minerals and inorganic and organic soil colloids; 
specific and non-specific absorption; kinetic processes and chemical equilibria in 
soils. Prerequisites: AGRO 626; CHEM 324 or approval of instructor.

626. Soil Mineralogy. (3-4). Credit 5.
Crystal structures and properties of important minerals in soils and sediments 
especially clay minerals and oxides combined with identification techniques 
involving theory and practice with x-ray diffraction, electron microscopy, infrared 
and chemical methods.

Behavior of nitrogen, phosphorous and potassium in soils; secondary nutrients, 
micronutrients and soil acidity and liming; interpretation of fertility data from 
current laboratory, greenhouse and field experiments. Prerequisites: AGRO 422; 
MEPS 313.

Fundamental concepts of dry milling, wet milling, oil extraction, baking, malting, 
brewing, storage, sanitation, and quality evaluation and control interrelated with 
physical and biochemical properties of cereals and their products; use of 
instrumentation and techniques to evaluate cereal quality. Prerequisite: Approval of 
instructor. Cross-listed with FSTC 630.

Theoretical and practical aspects of plant breeding including genetic basis; 
application of breeding methods and interdisciplinary considerations in breeding 
problems. Prerequisites: AGRO 304 or HORT 404; GENE 301; STAT 651.

642. Plant Breeding II. (3-0). Credit 3.
Expectations of genetic improvement for different plant breeding methods; 
relative efficiency for crops of different reproductive mechanisms; genetic 
variances, covariances and genotype-environment interaction components of 
variance used in planning selection procedures. Prerequisites: AGRO 641; GENE 
613; STAT 619.

643. Quantitative Genetics and Plant Breeding. (3-0). Credit 3.
Applied aspects of quantitative genetics in plant breeding; examination of
methodologies to analyze quantitative variation in crop species; genetic phenomena (inbreeding, heterosis and epistasis); quantitative trait loci (QTL) mapping and marker-assisted selection (MAS); genotype by environment interaction, heritability multiple traits and selection theory with implications in plant breeding. Prerequisites: AGRO 641; GENE 613; STAT 619 and 652. Cross-listed with GENE 643.

650. Mode of Action and Environmental Fate of Herbicides. (2-3). Credit 3. 
Relationships between physical-chemical characteristics of herbicides and their biological activity, selectivity, environmental fate in soil, water, and plants. Laboratory includes practical applications of gas and liquid chromatography, liquid scintillation counting and plant bioassays. Prerequisite: AGRO 450 or approval of instructor.

Fundamentals of weed invasion, development, persistence and competition with agronomic crops; consideration of ecological concepts important to weed-crop relationships as influenced by weed control and other cultural practices. Practical consideration of integrated weed management systems and weed identification. Prerequisites: AGRO 303; MEPS 313.

654. Genome Analysis. (3-0). Credit 3. 
Genome structure, organization and function of model organisms and higher eukaryotes; theory and methodology of genetic and physical mapping, comparative genomics, sequencing, sequence analysis and annotation; emphasis on understanding the function of complex genomes, genome-wide expression analysis, genetic and epigenetic mechanisms; X-inactivation, imprinting, gene silencing, transposons, genome duplication and evaluation. Prerequisite: GENE 603 or GENE 431. Cross-listed with GENE 654 and MEPS 654.

655. Analysis of Complex Genomes—Lab. (0-7). Credit 3. 
Laboratory methods in molecular genetic techniques for genetic mapping, physical mapping, and map-based cloning of both qualitative and quantitative phenotypes. Prerequisites: Concurrent registration in AGRO 654 and approval of instructor. Cross-listed with GENE 655 and MEPS 655.

An introduction to the theory and practice of spatial statistics as applied to the natural resources. Spatial analyses focusing primarily on ordinary kriging, point processes, and lattice data. Prerequisites: Math 141, 142, STAT 651, or equivalents; FRSC 651 preferred. Cross-listed with FRSC 663.

681. Seminar. Credit 1 each semester. 
For graduate students and staff members in soils and crops; presentation and discussion of special topics and research data; participation required of all graduate students in agronomy.

684. Professional Internship. Credit 1 or more each semester. 
Program planned to provide professional training in student's particular field of interest. Faculty and employer will supervise the activity. Work-study will be planned as a part of the Master of Agriculture degree program in agricultural chemistry, crops and soils. Prerequisite: Approval of instructor.

685. Directed Studies. Credit 1 to 4 each semester. 
Advanced problems in some phase of agronomy not directly related to thesis or dissertation.

689. Special Topics in... Credit 1 to 4. 
Selected topics in an identified area of agronomy. May be repeated for credit. Prerequisite: Approval of department head.

691. Research. Credit 1 or more each semester. 
Investigations leading to thesis or dissertation.