

SCSC - SOIL AND CROP SCIENCES (SCSC)

SCSC 105 World Food and Fiber Crops

Credits 3. 2 Lecture Hours. 2 Lab Hours. (AGRI 1307, AGRI 1407) World Food and Fiber Crops. Plant relationships, structure and development; environmental factors affecting plants; technological aspects of agricultural practices; food production for an increasing population.

SCSC 201 American Agriculture

Credits 3. 3 Lecture Hours. American Indian farming; land settlement and Homestead Act; crops, and livestock; effects of wars; land grant universities; United States Department of Agriculture (USDA); great depression; dust bowl; farm equipment; irrigation; fertilization; pest controls; biotech and genetically modified organisms (GMOs); plant breeding; organic; precision farming; drones; cultural and social aspects of agriculture.

SCSC 205 Problem Solving in Plant and Soil Systems

Credits 3. 2 Lecture Hours. 2 Lab Hours. Problems in management of soils, crops, and natural resources; problem solving skills including collecting, interpreting, using and communicating scientific and nonscientific data.

SCSC 289 Special Topics In...

Credits 0 to 4. 0 to 4 Other Hours. Selected topics in an identified area of soil and crop sciences. May be repeated for credit.

SCSC 291 Research

Credits 1 to 3. 1 to 3 Lecture Hours. Research conducted under the direction of faculty member in agronomy. May be repeated 2 times for credit. **Prerequisites:** Freshman or sophomore classification and approval of instructor.

SCSC 301 Soil Science

Credits 4. 3 Lecture Hours. 2 Lab Hours. Evaluation of the nature and properties of soils; explanation of the various soils, their components and roles in the environment using the scientific methods and technology. **Prerequisite:** Junior or senior classification, or approval of instructor.

SCSC 302 Recreational Turf

Credits 3. 3 Lecture Hours. Principles underlying construction and maintenance practices for turf facilities including athletic fields, golf courses, parks and home lawns; aesthetic, safety and economic aspects of turf varieties, soil conditions, plant protectants and maintenance equipment. **Prerequisite:** Biology or approval of instructor.

SCSC 304 Plant Breeding and Genetics

Credits 3. 3 Lecture Hours. 0 Lab Hours. Genetic improvement of crops by hybridization and selection; special breeding methods and techniques applicable to naturally self-pollinated, cross-pollinated and asexually reproduced plants. **Prerequisite:** SCSC 105, SCSC 205, or HORT 201, or approval of instructor.

SCSC 305 Professional Development in Agronomy

Credit 1. 2 Lab Hours. Enhancement of human relation skills related to a career in soil and crop sciences; field trip to Mississippi to interact with leadership from a global agricultural company; on-campus experiences to improve effective learning practices, job seeking and retention and setting and achieving near-term and long-term professional goals.

Prerequisites: Junior or senior classification or approval of instructor.

SCSC 307 Crop Biology and Physiology

Credits 4. 3 Lecture Hours. 2 Lab Hours. Emphasis on seed biology, germination, development of cells and tissues, anatomy, and growth and development of crop plants; plant hormones and tropisms, membranes and membrane transport, water absorption and transport through plants, photosynthesis, respiration and carbohydrate metabolism, and flowering; environmental effects on crop adaptation, growth, development, and productivity. **Prerequisites:** SCSC 205, junior or senior classification, or approval of instructor.

SCSC 309 Water in Soils and Plants

Credits 3. 3 Lecture Hours. 0 Lab Hours. Fundamentals of plant water use, and water movement and storage in soils; evapotranspiration, plant water requirements and irrigation scheduling; issues impacting irrigation and water quality; techniques for measuring soil and plant water relations. **Prerequisites:** SCSC 301; junior or senior classification; knowledge of college-level algebra; or approval of instructor.

SCSC 310 Soil Morphology and Interpretations

Credits 3. 2 Lecture Hours. 3 Lab Hours. Field study of morphological features of soil profiles and the morphological characterization of soils concerning interpretation for soil use and management. **Prerequisites:** Junior or senior classification or approval of instructor.

SCSC 311 Principles of Crop Production

Credits 3. 3 Lecture Hours. Origin and development of major U.S. agronomic crops; crop and species adaptation; crop management factors such as cultivar selection, planting, pest control, plant nutrition, irrigation, harvesting; organic farming; conservation agriculture; bioenergy crops; influence of markets, government policies, and global economy on cropping strategies; provide an understanding of the major row and drill (agronomic) crops grown in the United States including barley, corn, cotton, grain sorghum, peanuts, rice, soybean and wheat. **Prerequisites:** SCSC 105 or SCSC 205, junior or senior classification, or approval of instructor.

SCSC 312 Professional Development in Turfgrass

Credit 1. 2 Lab Hours. Includes but not limited to fertilizer, pesticide, irrigation calculations; turfgrass, insect and weed identification and management, soils and rootzone construction; irrigation system operation and auditing; sprayer and spreader operation and calibration; builds upon and allows application of information obtained in SCSC 302; designed to better prepare those intending to compete in the GCSAA and STMA Collegiate Turf Bowl competitions. **Prerequisite:** SCSC 302 or registration therein.

SCSC 315 Hemp Production and Utilization

Credits 3. 3 Lecture Hours. Advanced topics in principles and practices of producing hemp and its utilization in industrial, nutritional and therapeutic activities. **Prerequisite:** Junior or senior classification.

SCSC 330 Social and Ethical Aspects of International Cropping Systems

Credits 3. 3 Lecture Hours. 0 Lab Hours. Philosophical basis of ethical decisions; includes slavery, war, population growth, migration, farm workers, chemical inputs, genetically modified organisms, soil and water conservation and protection of wild species. **Prerequisite:** Junior or senior classification.

SCSC 401/FIVS 401 Forensic Soil Science

Credits 3. 2 Lecture Hours. 2 Lab Hours. Examination of soils biology, chemistry and physical attributes to solve crimes; soil and geologic characteristics associated with crime scene examination; physical, biological and chemical characteristics and use of trace evidence.

Prerequisite: Grade of C or better in FIVS 282. **Cross Listing:** FIVS 401/SCSC 401.

SCSC 402 Crop Stress Management

Credits 4. 3 Lecture Hours. 2 Lab Hours. Identification, measurement, biology, physiology and management of crop stress; limitations of specific environments to crop productivity; morphological and physiological crop stress response mechanisms. **Prerequisites:** SCSC 307, junior or senior classification, or approval of instructor.

SCSC 405 Soil and Water Microbiology

Credits 3. 3 Lecture Hours. Roles of soil and water microorganisms in the sustainability and productivity of various ecosystems with specific emphasis on plant-microbial interactions, nutrient cycling, degradation of pesticides and other xenobiotics, generation of trace gases, and soil and water quality; hands-on laboratory experience with current techniques in soil and water microbiology. **Prerequisites:** Junior or senior classification, or approval of instructor.

SCSC 406 Soil and Water Microbiology Laboratory

Credit 1. 2 Lab Hours. Hands-on experience with current techniques for examining the types, numbers, activity and roles of soil and water microorganisms with specific application to the carbon, nitrogen and sulfur cycle; plant-microbial interactions; soil and water quality. **Prerequisites:** SCSC 405 or concurrent enrollment; junior or senior classification or approval of instructor.

SCSC 410 International Agricultural Systems

Credits 3. 3 Lecture Hours. Contrast modern agriculture systems with those in developing countries; emphasis on natural resources and technologies interacting with economic and social development on a global scale. **Prerequisite:** Junior or senior classification, or approval of instructor.

SCSC 411/GENE 411 Biotechnology for Crop Improvement

Credits 3. 3 Lecture Hours. Use of biotechnology to improve agricultural, horticultural and forest crops; techniques and methods used and case studies where biotechnology has been used to alter traits such as pathogen resistance, protein or oil consumption, ripening, fertility and wood properties. **Prerequisite:** BIOL 111 or equivalent, or approval of instructor. **Cross Listing:** GENE 411/SCSC 411.

SCSC 420 Brazilian Agriculture and Food Production Systems

Credits 3 to 6. 3 to 6 Lecture Hours. Comparison and study of Brazilian and U.S. agriculture and culture related to soil, water, and forest conservation and management in Brazil; tour and learn about Amazon River, rain forest, Brasilia, farm, ranch, and floral production systems, agricultural cooperatives and research, sugar and alcohol production, phosphate mining and production; visit points of interest. **Prerequisite:** Junior or senior classification or approval of instructor.

SCSC 421 International Agricultural Research Centers - Mexico

Credits 3. 3 Lecture Hours. International agricultural research; CIMMYT interaction; modern and underdeveloped tropical agricultural systems; introduction to Mexican culture; critical evaluation of complex and international agricultural issues and research programs. **Prerequisites:** Junior or senior classification and approval of instructor.

SCSC 422 Soil Fertility and Plant Nutrient Management

Credits 3. 3 Lecture Hours. Chemical and biological reactions in soils that influence nutrient availability to plants; environmental aspects associated with nutrient availability and fertilization, especially for nitrogen (N) and phosphorus (P). **Prerequisites:** SCSC 301, junior or senior classification, or approval of instructor.

SCSC 424 Soil Chemistry

Credits 3. 3 Lecture Hours. Chemistry of clay minerals, inorganic solid phases, and organic colloids in soil; mass transfer reactions in soils: absorption/desorption, precipitation/dissolution, gas/liquid phase exchange; principles of soil acidity and salinity; introduction to application of equilibrium concepts in soils. **Prerequisites:** SCSC 301 or approval of instructor; completion of introductory or fundamental chemistry is strongly encouraged.

SCSC 427 Sports Field Construction

Credits 4. 3 Lecture Hours. 3 Lab Hours. Development of knowledge, skills, and experiences for the design and construction of a turfgrass-based sports field; case studies and visits to model fields, guest lectures from sports field owners, designers, and construction company managers; hands-on construction of a small-scale sand-based sports field. **Prerequisites:** SCSC 309, junior or senior classification, or approval of instructor.

SCSC 428 Advanced Turf Ecology and Physiology

Credits 3. 3 Lecture Hours. Examination of how environmental stresses, genetics, and cultural management practices influence the growth, development, and physiology of turfgrasses; exploration of how turf communities function within urban landscapes; introduction to environmental, social, and political issues encountered when managing these areas.

SCSC 429 Turf Management Systems

Credits 4. 3 Lecture Hours. 2 Lab Hours. Development of turf management plans for large turfgrass sites including parks, golf courses and sports facilities; use of case studies to critically analyze turf management programs. **Prerequisite:** SCSC 428.

SCSC 430 Turfgrass Maintenance

Credits 3. 3 Lecture Hours. Effective leadership and management strategies, organizational structures, human resource management, employee training and motivational strategies, effective professional communication approaches with clientele, employees and within a leadership team within a turfgrass facility framework; emphases on ethics, professional development and life-long learning. **Prerequisite:** SCSC 429 or approval of instructor.

SCSC 432 Soil Fertility and Plant Nutrient Management Laboratory

Credit 1. 3 Lab Hours. Methods used in soil testing, fertilizer recommendations, chemical and physical properties of soils, and determination of specific characteristics of a collected and analyzed soil sample. **Prerequisites:** SCSC 301; SCSC 422 or registration therein, junior or senior classification, or approval of instructor.

SCSC 436 Industrial Hemp Bioproducts

Credits 3. 3 Lecture Hours. Examination of the relevance and scalability (DIY vs research vs commercial) of renewable, industrial hemp bioproducts within emerging bioeconomies, including biomass production and conversion platforms, potential biopolymer (biocomposite, phytochemical, platform molecule markets), environmental impacts and ecosystem services, and social, policy, and ethical considerations. **Prerequisites:** Junior or senior classification or approval of instructor.

SCSC 441 Advances in Agronomic Sciences

Credits 3. 3 Lecture Hours. Synthesis, integration and extension of agronomic and related concepts for understanding the functioning and management of agricultural cropping systems. **Prerequisite:** Senior classification or approval of instructor.

SCSC 444 Forage Ecology and Management

Credits 3. 3 Lecture Hours. Investigation of multidisciplinary approaches toward the development of integrated forage, livestock, and wildlife production systems that are economically feasible and environmentally sustainable. **Prerequisite:** Junior or senior classification or approval of instructor.

SCSC 446 Weed Management and Ecology

Credits 3. 2 Lecture Hours. 2 Lab Hours. Practical information related to weed management and ecology for various vegetative systems to include turf and agronomic crops; calibration of applicators, herbicide labels, mode of action of herbicides, herbicide-resistant weed management. **Prerequisites:** BIOL 111, BIOL 101 or BIOL 113, junior or senior classification.

SCSC 453 Essentials for Weed Systematic Identification and Management in Agronomy

Credits 3. 3 Lecture Hours. Fundamental understanding and hands-on training on the basics of plant weed identification and management; relevant to agronomy, turf, horticulture and rangeland science and vegetation identification and management. **Prerequisite:** Junior or senior classification.

SCSC 455 Environmental Soil and Water Science

Credits 3. 3 Lecture Hours. Discussion of physical, chemical, and biological properties of soil and water and the impact on productivity and sustainability of various ecosystems; application of the knowledge of properties and soil processes to develop and evaluate strategies for protecting and/or improving soil and water quality. **Prerequisite:** SCSC 301 or approval of instructor.

SCSC 458 Watershed, Water and Soil Quality Management

Credits 3. 3 Lecture Hours. Land use impact on surface and ground water chemistry; legislation impacting water quality; surface and groundwater impairment and restoration. **Prerequisite:** CHEM 119 or equivalent or approval of instructor; junior or senior classification.

SCSC 481 Senior Seminar

Credits 2. 2 Lecture Hours. Capstone course bringing together student experiences, exams, and exercises necessary for completing and assessing curriculum program learning outcomes. **Prerequisite:** Senior classification.

SCSC 484 Internship

Credits 0 to 4. 0 to 4 Other Hours. Practical on-the-job experience in the student's area of specialization. **Prerequisites:** Junior or senior classification; approval of instructor; 2.0 or better GPR in major and overall.

SCSC 485 Directed Studies

Credits 0 to 4. 0 to 4 Other Hours. For advanced undergraduates to permit field or laboratory investigation or study of subject matter not included in established courses. **Prerequisite:** 10 hours of junior and senior agronomy or approval of instructor.

SCSC 489 Special Topics in...

Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours. Selected topics in an identified area of agronomy. May be repeated for credit. **Prerequisite:** Approval of department head.

SCSC 491 Research

Credits 0 to 4. 0 to 4 Other Hours. Research conducted under the direction of faculty member in agronomy. May be repeated 2 times for credit. Registration in multiple sections of this course are possible within a given semester provided that the per semester credit hour limit is not exceeded. **Prerequisites:** Junior or senior classification and approval of instructor.