

# 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 4. 3 Lecture Hours. 2 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. **Prerequisite:** SCSC 301; Junior or senior classification, or approval of instructor.

## SCSC 310 Soil Morphology and Interpretations

**Credits 2. 1 Lecture Hour. 3 Lab Hours.** Field study of morphological features of soil profiles and the morphological characterization of important soils of Texas in relation to soil use and management. **Prerequisite:** SCSC 301 or registration therein.

## 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 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 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.