



DEGREE PROGRAMS IN

The College of Agriculture and Life Sciences

Soil science deals with understanding and managing of our vital soil resources. Activities may be as basic as improving crop yields through fertilizer application, drainage and irrigation or as complex as studying the

principles of soil formation, soil water movement or biological nitrogen fixation.

In their natural state, soils exhibit tremendous variability. It is the job of the soil scientist to understand how and why soils differ and to evaluate and interpret soil properties to determine suitable uses and limitations.

Soil resource management requires the integration of physics, chemistry and biology. Specific soil physical properties include water retention, oxygen movement, density, porosity, particle size and heat transfer. Chemical properties of concern involve acidity, ion exchange, fertility, trace element content and pesticide interaction. Biological properties encompass organic matter decomposition, nitrogen fixation, nutrient release, soil-root interactions and soil-borne pathogens. Soil science is multidisciplinary in nature and requires a multidisciplinary approach to study and find solutions for land management problems.

While the role of soils in food and fiber production is crucial, the soil is also instrumental in most other land uses. Designing residential and commercial developments, disposing of wastes by subsurface soil absorption, applying industrial and municipal wastes to the soil surface, designing roadways, planning recreation areas or managing storm water runoff all require an understanding of soil properties and capabilities.

Career Opportunities

Soil scientists are actively involved in solving many of society's most pressing problems. They play a role in maximizing food production, planning efficient urban development, safely disposing of wastes, conserving prime farm land, reducing the impact of soil erosion, conserving the world's energy resources and many other activities.

Graduates from North Carolina State University with a background in soil science pursue professions in a wide variety of interesting areas. Some pursue careers with state and federal agencies in soil conservation, soil survey or other

fields of land management. Many apply their soil management expertise to crop production in a farming operation or as consultants to large commercial agricultural producers. An increasing number of opportunities are available in waste management through land application and septic system design as well as other engineering aspects of soils. Extension, research and educational organizations have traditionally been active employers of soil scientists.

Soil science also plays an important role in forest fertilization and management, water quality protection, agricultural chemical sales, farm management,

landscape design and land use planning. An education in soil science can be tailored to prepare students for graduate study and pursuit of an exciting career in research. Many students further their education at the masters or doctorate level.

Course Work/Curriculum

Soil scientists receive a broad education in the basic sciences. Chemistry, mathematics, physics and biology are essential parts of the curriculum. In addition to courses in soil fertility, soil classification, soil physical properties and soil-crop management, students can study water

management, forestry, crop management, geology, resource management, plant diseases and turf management. The curriculum is strengthened with courses to improve speaking and writing skills along with economics, statistics and computer science.

The study of soil science at NC State University can take several forms. A student may select the soil science option within the agronomy curriculum. Since agronomy deals with both soil and crop sciences, a student will receive a strong background in both areas while emphasizing the soils discipline. A second opportunity is in the natural resources curriculum, where a concentration in soil resources or soil and water systems can be selected. The environmental sciences curriculum offers a third opportunity to specialize in soil science. This curriculum has a stronger core of basic sciences. A student may also choose to strengthen another academic major, such as forestry, horticulture, geology or engineering, with a minor concentration in soil science. By carefully choosing elective courses, students may tailor their academic training to specific backgrounds and interests.

Graduate Study

The Department of Soil Science offers graduate programs leading to the master of science and doctoral degrees. A master of natural resource administration degree with a soil science option is also available. Students may specialize in soil physics; soil chemistry; soil microbiology and biochemistry; soil fertility and plant nutrition; soil genesis, morphology and classification; soil and water management and conservation; forest soils; soil mineralogy; or tropical soils. An advisory committee will assist the student in designing an individualized program of study and research. Supporting course work can be taken in ecology, engineering, biochemistry, microbiology, chemistry, political science, economics, statistics, geology, crop science, forestry or botany. Excellent facilities are available to support both field and laboratory research. Greenhouses and a

phytotron are located on campus, and field studies may be carried out on research stations throughout the state.

Research

Soil science offers a diverse array of applied and basic research. Areas of study include soil fertility levels for various row crops, forests, fruits and vegetables. Several researchers are studying tillage and water relationships as well as irrigation scheduling improvements. Basic research is under way in areas of soil formation, clay mineral chemistry, microbial nitrogen fixation, and nutrient movement at the soil-root interface.

Co-Curricular Activities

Students can expand their classroom education by taking advantage of co-curricular activities. Participation in the Agronomy Club affords an opportunity to develop leadership skills and cultivate lifelong professional friendships. Club activities include a variety of work and service projects, guest speakers, programs for interacting with faculty, and opportunities to participate in essay and speech contests to improve communication skills. Activities extend beyond the campus to regional and national collegiate soil judging contests and meetings with students from other universities.

In addition, students may pursue

special internships and part-time employment to add a wealth of experience to their classroom study. Such activities provide a valuable contribution to the professional and social development of the student.

Career Services

In addition to faculty advisers who are available to provide information about career and employment opportunities, the College of Agriculture and Life Sciences Career Services Office is available to assist students and alumni. The Career Services Office provides students with information about summer internships and co-op opportunities in their career fields and assists them in applying for such positions. The Career Services Office also helps students write resumes and polish interview skills. The office arranges on-campus interviews for prospective graduates and publicizes employment opportunities through e-mail and the Web. Alumni are also able to take advantage of these services and are informed about employment prospects through a web site.

For more information:

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