

Soil Science (SOIL)

SOIL 194. Individual Study. 1-5 Credits.**SOIL 196. Field Experience. 1-15 Credits.****SOIL 199. Special Topics. 1-5 Credits.****SOIL 210. Introduction to Soil Science. 3 Credits.**

Physical, chemical and biological properties of soils, as related to use, conservation and plant growth. 2 lectures, 1 laboratory. F,S.

SOIL 217. Introduction to Meteorology & Climatology. 3 Credits.

Basic meteorology-climatology concepts and their application; includes energy balance, greenhouse effect, temperature, pressure systems, lows, highs, fronts, winds, clouds, storms, humidity, precipitation, and measurements. Lectures, discussions, demonstrations. Prereq: MATH 103. S.

SOIL 264. Natural Resource Management Systems. 3 Credits.

General principles of natural resource management, including soil and water conservation, soil and wind erosion, use of tillage and vegetation for conservation, drainage, irrigation, and soil and water quality. 3 lectures. Prereq: MATH 103, MATH 104 or MATH 107. Cross-listed with ASM 264 and NRM 264.

SOIL 291. Seminar. 1-5 Credits.**SOIL 292. Study Abroad. 1-15 Credits.****SOIL 294. Individual Study. 1-5 Credits.****SOIL 299. Special Topics. 1-5 Credits.****SOIL 322. Soil Fertility and Fertilizers. 3 Credits.**

Principles of plant nutrition and soil nutrient availability; soil testing and fertilizer recommendations and management. Macronutrient emphasis. 2 lectures, 1 two-hour laboratory. Prereq: SOIL 210, CHEM 121, CHEM 121L. S.

SOIL 351. Soil Ecology. 3 Credits.

Principles of soil-plant-animal interactions and their influences on environmental and agricultural issues of global significance (e.g. sustainable agriculture, global climate change, diversity conservation. Prereq: SOIL 210.

SOIL 379. Study Tour Abroad. 1-6 Credits.**SOIL 391. Seminar. 1-5 Credits.****SOIL 392. Study Abroad. 1-15 Credits.****SOIL 394. Individual Study. 1-5 Credits.****SOIL 397. Fe/Coop Ed/Internship. 1-4 Credits.****SOIL 399. Special Topics. 1-5 Credits.****SOIL 410. Soils and Land Use. 3 Credits.**

Principles of chemistry, physics and biology will be used to determine the effects of soil management, agrichemical usage, livestock production, and vegetation on the environment using scales ranging from microsite to watershed. Prereq: SOIL 210, CHEM 121, CHEM 121L. {Also offered for graduate credit - see SOIL 610.}

SOIL 433. Soil Physics. 3 Credits.

Soil as a three-phase system. Application to soil of physical principles and measurements of soil properties, including density, texture, structure, water content, heat capacity, and transport coefficients. Relationship of properties to agricultural and industrial contamination. 2 lectures, 1 laboratory. Prereq: SOIL 210, PHYS 211, MATH 146. F {Also offered for graduate credit - see SOIL 633.}

SOIL 444. Soil Genesis and Survey. 3 Credits.

Introduction to soil genesis, morphology, geography and soil survey, 2 lectures, 1 four-hour laboratory (first 10 weeks only) focuses on soil description and properties in situ. Prereq: SOIL 210. F {Also offered for graduate credit - see SOIL 644.}

SOIL 447. Microclimatology. 3 Credits.

Characteristics and causes of the climate near the ground and its interaction with living organisms. Energy and mass transfer concepts. Lectures, discussions, demonstrations, field trips. Prereq: PHYS 211. F (odd years) {Also offered for graduate credit - see SOIL 647.}

SOIL 454. Wetland Resources Management. 3 Credits.

Principles of wetland systems, wetland management, wetland functions, wetland delineation, wetland assessment, and wetland improvement. Prereq: SOIL 210. Cross-listed with NRM 454 and RNG 454. F (even years) {Also offered for graduate credit - see SOIL 654.}

SOIL 462. Natural Resource and Rangeland Planning. 3 Credits.

Capstone experience for School of Natural Resources Sciences majors: students use advanced planning tools and different management strategies to demonstrate integrated knowledge in managing public and private natural resources. Prereq: at least senior standing and must be a Natural Resources Management, Range Science or Soil Science major. Cross-listed with NRM and RNG. {Also offered for graduate credit - see SOIL 662.}

SOIL 465. Soil And Plant Analysis. 3 Credits.

Laboratory analysis of soil, plant, and environmental materials for constituent elements. 2 lectures, 1 laboratory. Prereq: SOIL 210, CHEM 121, CHEM 122. S (odd years) {Also offered for graduate credit - see SOIL 665.}

SOIL 480. Soils and Pollution. 3 Credits.

To provide the basic physical, chemical, and biological fate and transport processes of pollution in soils and to neighboring water bodies. Also, how to model and apply these processes to the landscape scale. Prereq: MATH 146, CHEM 121, CHEM 121L. {Also offered for graduate credit - see SOIL 680.}

SOIL 491. Seminar. 1-5 Credits.**SOIL 492. Study Abroad. 1-15 Credits.****SOIL 494. Individual Study. 1-5 Credits.****SOIL 496. Field Experience. 1-15 Credits.****SOIL 499. Special Topics. 1-5 Credits.****SOIL 610. Soils and Land Use. 3 Credits.**

Principles of chemistry, physics and biology will be used to determine the effects of soil management, agrichemical usage, livestock production, and vegetation on the environment using scales ranging from microsite to watershed. {Also offered for undergraduate credit - see SOIL 410.}

SOIL 633. Soil Physics. 3 Credits.

Soil as a three-phase system. Application to soil of physical principles and measurements of soil properties, including density, texture, structure, water content, heat capacity, and transport coefficients. Relationship of properties to agricultural and industrial contamination. 2 lectures, 1 laboratory. F {Also offered for undergraduate credit - see SOIL 433.}

SOIL 644. Soil Genesis and Survey. 3 Credits.

Introduction to soil genesis, morphology, geography and soil survey, 2 lectures, 1 four-hour laboratory (first 10 weeks only) focuses on soil description and properties in situ. F {Also offered for undergraduate credit - see SOIL 444.}

SOIL 647. Microclimatology. 3 Credits.

Characteristics and causes of the climate near the ground and its interaction with living organisms. Energy and mass transfer concepts. Lectures, discussions, demonstrations, field trips. F (odd years) {Also offered for undergraduate credit - see SOIL 447.}.

SOIL 654. Wetland Resources Management. 3 Credits.

Principles of wetland systems, wetland management, wetland functions, wetland delineation, wetland assessment, and wetland improvement. Cross-listed with NRM 654 and RNG 654. F (even years) {Also offered for undergraduate credit - see SOIL 454.}.

SOIL 662. Natural Resource and Rangeland Planning. 3 Credits.

Capstone experience for School of Natural Resources Sciences majors: students use advanced planning tools and different management strategies to demonstrate integrated knowledge in managing public and private natural resources. Cross-listed with NRM and RNG. {Also offered for undergraduate credit - see SOIL 462.}.

SOIL 665. Soil And Plant Analysis. 3 Credits.

Laboratory analysis of soil, plant, and environmental materials for constituent elements. 2 lectures, 1 laboratory. S (odd years.) {Also offered for undergraduate credit - see SOIL 465.}.

SOIL 680. Soils and Pollution. 3 Credits.

To provide the basic physical, chemical, and biological fate and transport processes of pollution in soils and to neighboring water bodies. Also, how to model and apply these processes to the landscape scale. {Also offered for undergraduate credit - see SOIL 480.}.

SOIL 690. Graduate Seminar. 1-3 Credits.**SOIL 695. Field Experience. 1-15 Credits.****SOIL 696. Special Topics. 1-5 Credits.****SOIL 721. Environmental Field Instrumentation and Sampling. 2 Credits.**

To provide an overview of the tools (manual and electronic) concepts, and theories used to sample for physical, chemical, and biological parameters. F (odd years) (Two one-hour lectures and one four-hour laboratory per week.).

SOIL 733. Modeling Environmental Fate and Transport. 2 Credits.

To provide the principles of modeling physical, chemical, and biological fate and transport processes for application in current environmental problems. Emphasis placed on mathematically expressing processes and describing observations. Offered spring semester, even years.

SOIL 755. Soil Chemistry. 3 Credits.

Chemical reactions and equilibria, solubility relationships, mineral weathering, cation and anion adsorption, redox reactions, metal chelation, and fixation of nutrients in the soil. 3 lectures. F.

SOIL 763. Advanced Soil Physics. 3 Credits.

Composition of soil in terms of solid, liquid, and gaseous phases. Theory of water, heat, and solute transport processes. Water availability for plant growth. 2 lectures, 1 laboratory. Prereq: SOIL 633. (even years).

SOIL 782. Advanced Soil Fertility. 2 Credits.

Advanced study of soil-plant-nutrient relationships with emphasis on concepts of soil fertility, ion absorption, nutrient transformation, and interpretation of experimental data. 2 lectures. F (even years).

SOIL 784. Advanced Soil Genesis, Morphology and Classification. 2 Credits.

Advanced study of processes of soil development, soil morphology, and principles of soil classification. 2 lectures. Prereq: SOIL 644. F (even years).

SOIL 790. Graduate Seminar. 1-3 Credits.**SOIL 791. Temporary/Trial Topics. 1-5 Credits.****SOIL 793. Individual Study/Tutorial. 1-5 Credits.****SOIL 794. Practicum/Teaching. 1-8 Credits.****SOIL 795. Field Experience. 1-15 Credits.****SOIL 796. Special Topics. 1-5 Credits.****SOIL 797. Master's Paper. 1-3 Credits.****SOIL 798. Master's Thesis. 1-10 Credits.****SOIL 899. Doctoral Dissertation. 1-15 Credits.**