Soil Science (SOIL)

Credits

SOIL 210 - Intro To Soil Science **3**
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**
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 322 - Soil Fertility and Fertilizers **3**
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, 121L. S

SOIL 351 - Soil Ecology **3**
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 410 - Soils and Land Use **3**
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, 121L.

SOIL 433 - Soil Physics **3**
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

SOIL 444 - Soil Genesis And Survey **4**
Introduction to soil genesis, morphology, geography, techniques of soil survey; field studies and description of soils. 3 lectures, 1 three-hour laboratory. One or more Saturday field trips. Prereq: SOIL 210. F

SOIL 447 - Microclimatology **3**
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)

SOIL 465 - Soil And Plant Analysis **3**
Laboratory analysis of soil, plant, and environmental materials for constituent elements. 2 lectures, 1 laboratory. Prereq: SOIL 210, CHEM 330, 331. S (odd years)

SOIL 480 - Soils and Pollution **3**
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, 121L.

SOIL 610 - Soils and Land Use **3**
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, 121L.

SOIL 633 - Soil Physics **3**
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

SOIL 644 - Soil Genesis And Survey **4**
Introduction to soil genesis, morphology, geography, techniques of soil survey; field studies and description of soils. 3 lectures, 1 three-hour laboratory. One or more Saturday field trips. Prereq: SOIL 210. F

SOIL 647 - Microclimatology **3**
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)

SOIL 665 - Soil And Plant Analysis **3**
Laboratory analysis of soil, plant, and environmental materials for constituent elements. 2 lectures, 1 laboratory. Prereq: SOIL 210, CHEM 330, 331. S (odd years)

SOIL 680 - Soils and Pollution **3**
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, 121L.

Credits

SOIL 721 - Environmental Field Instrumentation and Sampling **2**

To provide an overview of the tools (manual and electronic) concepts, and theories used to sample for physical, chemical, and biological parameters. Offered fall semester, odd years. 8-week course. (Two one-hour lectures and one four-hour laboratory per week.)

SOIL 733 - Modeling Environmental Fate and Transport **2**

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. Prereq: MATH 146 and CHEM 121 and CHEM 121L.

SOIL 755 - Soil Chemistry **3**

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. Prereq: SOIL 332, CHEM 122, 122L. F

SOIL 763 - Advanced Soil Physics **3**

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 433 or SOIL 633, PHYS 211, MATH 146 or 165. (even years)

SOIL 782 - Advanced Soil Fertility **2**

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. Prereq: SOIL 322. F (even years)

SOIL 784 - Advanced Soil Genesis, Morphology and Classification **2**

Advanced study of processes of soil development, soil morphology, and principles of soil classification. 2 lectures. Prereq: SOIL 444/644. F (even years)