Soil Science (SOIL)

SOIL 2100: Introduction to Soils
Introduction to soil sciences with emphasis placed on physical, biological, and chemical properties and application to land use, plant growth and environmental problems.

Credit Hours: 3
Recommended: 3 hours of Chemistry

SOIL 2106: Soil Science Laboratory
Laboratory application of fundamental soil science concepts.

Credit Hours: 2
Corequisites: SOIL 2100

SOIL 3001: Topics in Soil Science
Organized study of selected topics in soil science.

Credit Hour: 1-99

SOIL 3085: Problems in Soil Science
Special individualized research projects or readings in soil science.

Credit Hour: 1-99

SOIL 3290: Soils and the Environment
(same as ENV_SC 3290). Addresses the role of soils and soil properties on environmental pollution and management. Emphasis will be placed on carbon, nitrogen, phosphorus, and sulfur transformations and transport in natural and disturbed ecosystems and soil management practices and technology to prevent or remediate environmental pollution.

Credit Hours: 3
Prerequisites: SOIL 2100 and ENGLSH 1000
Recommended: 3 hours of chemistry

SOIL 3290W: Soils and the Environment - Writing Intensive
(same as ENV_SC 3290W). Addresses the role of soils and soil properties on environmental pollution and management. Emphasis will be placed on carbon, nitrogen, phosphorus, and sulfur transformations and transport in natural and disturbed ecosystems and soil management practices and technology to prevent or remediate environmental pollution.

Credit Hours: 3
Prerequisites: SOIL 2100 and ENGLSH 1000
Recommended: 3 hours of chemistry

SOIL 3500: Soil Morphology
This course will support and complement the undergraduate soil judging team and provide valuable field morphology experience for students. The specific conditions by which a soil is formed cause the soil to exhibit unique physical, chemical, and biological properties which impact how soil can be used by humans. Soil judging competitions take place around the country and provide students a hands-on experience to evaluate soil morphology and interpretations. This course will cover the basic principles of soil formation, how to complete basic field descriptions of soils, and how to use soil descriptions to evaluate implications of various land uses. Graded on A-F basis only.

Credit Hours: 2

SOIL 4085: Problems in Soil Science
Special individualized non-thesis research projects or readings in soil science.

Credit Hour: 1-99

SOIL 4305: Environmental Soil Physics
(same as ENV_SC 4305; cross-leveled with ENV_SC 7305, SOIL 7305). Study of soil physical properties and processes important in solving environmental problems. Topics include soil solids, water content and energy, and transport of water, solutes, gas and heat.

Credit Hours: 3
Prerequisites: SOIL 2100

SOIL 4306: Environmental Soil Physics Laboratory
(same as ENV_SC 4306; cross-leveled with ENV_SC 7306, SOIL 7306). Introduction to the methodology and equipment for measurement of soil physical properties and processes.

Credit Hours: 2
Prerequisites or Corequisites: SOIL 4305

SOIL 4308: Soil Conservation
(cross-leveled with SOIL 7308). Conservation of soil with respect to topsoil, soil productivity, and fertility.

Credit Hours: 3
Prerequisites: SOIL 2100
Recommended: AG_S_M 4420

SOIL 4312: Environmental Soil Microbiology
(same as ENV_SC 4312; cross-leveled with SOIL 7312, ENV_SC 7312). Microbiology/ecology of life in the soil ecosystem. Emphasis is placed on the role of microbes in nutrient cycling, microbial pesticide/xenobiotic transformation bioremediation, etc.

Credit Hours: 3
Prerequisites: SOIL 2100
Recommended: general microbiology

SOIL 4313: Soil Fertility and Plant Nutrition
(same as PLNT_SCI 4313; cross-leveled with SOIL 7313, PLNT_SCI 7313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of soil amendments.

Credit Hours: 3
Prerequisites: SOIL 2100 or instructor's consent

SOIL 4318: Environmental Soil Chemistry
(same as ENV_SC 4318, GEOL 4318; cross-leveled with ENV_SC 7318, GEOL 7318, SOIL 7318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals, and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes.

Credit Hours: 3
Prerequisites: SOIL 2100 or GEOL 2400, CHEM 1320 and CHEM 1330; junior standing or instructor's consent

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SOIL 4320: Genesis of Soil Landscapes
(cross-leveled with SOIL 7320). The co-evolution of soil landscapes. The role of water in the accumulation of parent materials and development of soil horizons. Factors and processes of soil genesis. Distribution of soil in their natural settings.

Credit Hours: 4
Recommended: introductory soil science or introductory geology course

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SOIL 4360: Precision Agriculture Basics
(same as AG_S_TCH 4360, PLNT_SCI 4360; cross-leveled with SOIL 7360, AG_S_TCH 7360, PLNT_SCI 7360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GNSS, remote sensing), mapping methods, and case studies illustrating decisions and management.

Credit Hours: 3
Prerequisites: SOIL 2100, or PLNT_SCI 2110; MATH 1100; AG_S_TCH 1040

SOIL 4940: Soil Science Internship
Supervised professional experience with an approved public or private organization. Course may be repeated for credit. Graded on S/U basis only.

Credit Hour: 1-12
Prerequisites: Soil and Atmospheric Sciences majors only, instructor's consent

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SOIL 4945: Experiential Learning in Industry Internship in Soil Science
Learning experience combining observation, application, and reflection in a discipline-based industry internship. Course appears on transcript for zero credit and does not count toward full-time enrollment. No tuition or fees are charged. Graded on S/U basis only.

Credit Hours: 0
Prerequisites: instructor's consent

SOIL 7001: Topics in Soil Science
Organized study of selected topics in soil science. Intended for graduate students.

Credit Hour: 1-99

SOIL 7085: Problems in Soil Science
Special individualized non-thesis research projects or readings in soil science.

Credit Hour: 1-99
Prerequisites: graduate standing

SOIL 7305: Environmental Soil Physics
(same as ENV_SC 7305; cross-leveled with SOIL 4305, ENV_SC 4305). Study of soil physical properties and processes important in solving environmental problems. Topics include soil solids, water content and energy, and transport of water, solutes, gas and heat.

Credit Hours: 3
Prerequisites: SOIL 2100, PHYSCS 1210 or equivalent

SOIL 7306: Environmental Soil Physics Laboratory
(same as ENV_SC 7306; cross-leveled with ENV_SC 4306, SOIL 4306). Introduction to the methodology and equipment for measurement of soil physical properties and properties and processes.

Credit Hours: 2
Prerequisites or Corequisites: SOIL 4305

SOIL 7308: Soil Conservation
(cross-leveled with SOIL 4308). Conservation of soil with respect to topsoil, soil productivity, and fertility.

Credit Hours: 3

Prerequisites: SOIL 2100
Recommended: AG_S_M 4420

SOIL 7312: Environmental Soil Microbiology
(same as ENV_SC 7312; cross-leveled with SOIL 4312, ENV_SC 4312). Microbiology/ecology of life in the soil ecosystem. Emphasis is placed on the role of microbes in nutrient cycling, microbial pesticide/xenobiotic transformations bioremediation, etc.

Credit Hours: 3
Prerequisites: general microbiology, SOIL 2100, or instructor's consent

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SOIL 7313: Soil Fertility and Plant Nutrition
(same as PLNT_SCI 7313; cross-leveled with SOIL 4313, PLNT_SCI 4313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of soil amendments.

Credit Hours: 3
Prerequisites: SOIL 2100 or instructor's consent

SOIL 7314: Soil Fertility and Plant Nutrition Laboratory
(same as PLNT_SCI 7314; cross-leveled with SOIL 4314, PLNT_SCI 4314). The application of elementary analytical procedures to the evaluation of the nutrient status of soils and crop plants.

Credit Hours: 2
Prerequisites or Corequisites: SOIL 7313

SOIL 7318: Environmental Soil Chemistry
(same as GEOL 7318, ENV_SC 7318; cross-leveled with ENV_SC 4318, GEOL 4318, SOIL 4318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals, and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes.

Credit Hours: 3
Prerequisites: SOIL 2100 or GEOL 2400, CHEM 1320 and CHEM 1330; junior standing or instructor's consent

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SOIL 7320: Genesis of Soil Landscape
(cross-leveled with SOIL 4320). The co-evolution of soil landscapes. The role of water in the accumulation of parent materials and development of soil horizons. Factors and processes of soil genesis. Distribution of soil in their natural settings.

Credit Hours: 4
Prerequisites: introductory soil science or introductory geology or permission of instructor

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SOIL 7360: Precision Agriculture Basics
(same as AG_S_TCH 7360, PLNT_SCI 7360; cross-leveled with SOIL 4360, AG_S_TCH 4360, PLNT_SCI 4360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GNSS, remote sensing), mapping methods, and case studies illustrating decisions and management.

Credit Hours: 3
Prerequisites: SOIL 2100, or PLNT_SCI 2110; MATH 1100; AG_S_TCH 1040

SOIL 8001: Topics in Soil Science
Organized study of selected topics in soil science. Intended for graduate students.

Credit Hour: 1-99

SOIL 8085: Problems in Soil Science
Special individualized non-thesis research projects or readings in soil science.

Credit Hour: 1-99

SOIL 8090: Masters Research in Soil Science
Original investigations in soil science for presentation in a thesis. Graded on S/U basis only.

Credit Hour: 1-10

SOIL 8400: Solute Transport in the Vadose Zone
(same as ENV_SC 8400). Transport of water and solutes in geomedia with emphasis on development of the equations of flow. Evaluation of analytical and numeral solutions to equations describing transport phenomena.

Credit Hours: 3
Prerequisites: ENV_SC 7305 or SOIL 7305

SOIL 8500: Ecosystem Biogeochemistry
Study of the patterns and processes of energy and nutrient transfers within and between ecosystems. Topics will focus on the cycling and interaction of elements between biotic and abiotic components of terrestrial and aquatic ecosystems. The role human activities play on biogeochemical dynamics will be explored through lectures, discussions, and a course project.

Credit Hours: 3
Prerequisites or Corequisites: SOIL 7318 or instructor consent

SOIL 9085: Problems in Soil Science
Special individualized non-thesis research projects or readings in soil science.

Credit Hour: 1-99

SOIL 9087: Seminar in Soil Science
In-depth development of advanced aspects of soil science through reviews of results of research in progress and current scientific publications.

Credit Hour: 1

SOIL 9090: Doctoral Research in Soil Science
Original investigations in soil science for presentation in a dissertation. Graded on S/U basis only.

Credit Hour: 1-10

SOIL 9422: Pedology
Three one-hour lectures. Detailed study of processes of soil horizonization and current topics in soil genesis including quantitative assessment of spatial and temporal variability and application of GIS in landuse planning.

Credit Hours: 3
Prerequisites: SOIL 7320, one statistics course beyond ANOVA