

SOIL AND WATER SCIENCES

Course Search

Not all courses are offered every semester. Refer to the schedule of courses for each term's specific offerings.

[More Info](#)

Courses at the University of Florida, with the exception of specific foreign language courses and courses in the online Master of Arts in Mass Communication program, are taught in English.

Courses

AGG 4502 Nanotechnology in Food, Agriculture, and Environment

3 Credits

Application of nanotechnology in crop production, food processing and preservation, and environmental remediation; behavior of engineered nanoparticles in plant, soil and the environment, and environmental toxicology and regulations of engineered nanoparticles.

ALS 3133 Agricultural and Environmental Quality

3 Credits

Analysis of effects of agriculture on environmental quality; emphasis on agricultural wastes and practices; potential for using agricultural systems for disposal of other wastes; effects of pollution on the agricultural environment. (P)

General Education - Physical Science

ALS 4154 Global Agroecosystems

3 Credits

Focuses on the principles of agroecology and presentation of topics that integrate ecological with agricultural principles to optimize resource conservation, productivity, societal benefit, and profitability.

Prereq: SWS 3022, ALS 3153 and AGR 4214C or the equivalent

SWS 2007 The World of Water

3 Credits

The full range of water issues including abundance and quality of water in the environment, water policy and conflict. (P)

General Education - Physical Science

SWS 2008 Land and Life

3 Credits

Relationships between human activities and soil and environmental quality. Lectures concentrate on the fundamentals of soil and environmental science using case studies to illustrate basic principles. Intended for non-majors. (B)

General Education - Biological Science

SWS 3022 Introduction to Soils in the Environment

3 Credits

Fundamentals of soil science emphasizing the physical, chemical and biological properties of soils in relation to growth of native and agricultural plants and environmental uses. (P)

General Education - Physical Science

SWS 3022L Introduction to Soils in the Environment Laboratory

1 Credit

Hands-on exposure to soils-related properties and processes.

SWS 3023L Soil Judging

2 Credits

Students learn to inventory soil properties and record them on a standard form used by USDA soil scientists. Students travel locally to the field and also attend a 3-day regional soil judging contest where they learn to classify soils using soil taxonomy and to interpret soil quality and behavior from soil properties.

SWS 4116 Environmental Nutrient Management

3 Credits

Consumption, existing reserves, formulation, chemical and physical properties, and manufacture of commercial fertilizers; basic chemical reactions of fertilizer materials with the soil and the fate of the nutritional elements whether it be loss by leaching, plant uptake, fixation or soil retention. (P)

Prereq: SWS 3022

General Education - Physical Science

SWS 4180 Earth System Analysis

3 Credits

Analysis of global-scale interdependences between climate, biogeochemical cycles and humans using a systems approach.

Prereq: MAC 2233 or PHY 2048

SWS 4204 Urban Soil and Water Systems

3 Credits

Issues and opportunities related to soil and water quality in urban systems. Students will learn and discuss consequences of human population growth on soil and water systems in urban areas.

Prereq: SWS 3022

SWS 4207 Sustainable Agricultural and Urban Land Management

3 Credits

Agricultural and urban water quality issues in Florida, their bases, land and nutrient management strategies and the science and policy behind Best Management Practices (BMPs). Students will learn to evaluate BMP research and analyze its role in determining practices and policies that protect water quality.

Prereq: SWS 3022 or instructor permission

SWS 4223 Environmental Biogeochemistry

3 Credits

To gain understanding of the earth as a biogeochemistry system in the context of global change.

Prereq: BSC 2005 and BSC 2005L or BSC 2010 and BSC 2010L and CHM 2045 and 2045L

SWS 4231C Soil, Water and Land Use

3 Credits

Suitabilities/limitations of soils for different uses; using soil surveys and related information to plan use/management of land; behavior of water in soils/landscapes; policies for and implications of water allocation among urban, agricultural and natural resource uses. (P)

General Education - Physical Science

SWS 4233 Soil and Water Conservation

3 Credits

Soil/water resources, historical erosions and sediment problems, geologic vs. accelerated erosion, erosion prediction equations and government conservation programs; water conservation, irrigation, drainage and salinity; stormwater management; and case studies in erosion and sedimentation.

SWS 4244 Wetlands

3 Credits

Introduces wetland ecosystems with emphasis on principles and problems associated with their functions and values as related to water quality. Students become familiar with basic and applied concepts in hydrology, soils and vegetation of both constructed and natural wetlands.

SWS 4245 Water Resource Sustainability

3 Credits

The quantitative effects of human impacts on hydrologic ecosystems (aquifers, watersheds, coastal zones, lakes and wetlands). Case studies illustrate detrimental effects of unsustainable resource utilization and beneficial management strategies.

SWS 4303C Soil Microbial Ecology

3 Credits

Occurrence and activities of soil microorganisms and their influence on soil productivity and environmental quality.

Prereq: BSC 2005 and BSC 2005L or BSC 2010 and BSC 2010L

- SWS 4307 Ecology of Waterborne Pathogens** **3 Credits**
Survival strategies, gene regulation and metabolism of waterborne pathogens. Methods for microbe detection and control.
Prereq: MCB 3020, MCB 3023 or MCB 4203, or equivalent
- SWS 4451 Soil and Water Chemistry** **3 Credits**
Physico-chemical processes such as mineral weathering and formation, sorption and ion exchange. Also includes introduction to diffuse double-layer theory.
- SWS 4550 Soils, Water and Public Health** **3 Credits**
Important instances where soil and water science and public health overlap. Students develop skills required for competency in both disciplines.
Prereq: CHM 2045, CHM 2046 and BSC 2010, or instructor permission
- SWS 4602C Soil Physics** **3 Credits**
Physical processes and properties of soils that influence optimum growth of plants as well as potential for groundwater pollution from agrochemicals and applied wastes. Primary emphasis is given to basic concepts of transport and retention for water and solutes; secondary emphasis is given to air and heat in the root zone of the soil profile; and limited attention is given to mechanical properties of soil that affect the proliferation of plant roots. (P)
Prereq: MAC 2311, PHY 2004 and SWS 3022
General Education - Physical Science
- SWS 4715C Environmental Pedology** **4 Credits**
Study and analysis of soil in the environment and the factors responsible for soil formation and geographic distribution. Development of hydric soil criteria and hydric soil indicators. Emphasis on morphology or hydric/ non-hydric soils and introduction to diagnostic horizons and soil classification. Course also includes abs on soil field techniques.
Prereq: SWS 3022
- SWS 4720C GIS in Soil and Water Science** **3 Credits**
Basic, practical understanding of GIS concepts, technical issues and applications to soil and water science using ArcGIS geographic information system.
- SWS 4800 Environmental Soil and Water Monitoring Techniques** **3 Credits**
Introduces students to the principles, objectives and practices in environmental monitoring. Students will learn the proper techniques in planning for monitoring projects, sampling design, sample collection, basic principles of laboratory analysis and basic data analysis. Quality assurance and quality control requirements are introduced and emphasized.
Prereq: BSC 2010 and BSC 2010L
- SWS 4900 Supervised Extension Experience in Soil and Water Sciences** **3 Credits**
Firsthand, authentic extension experiences in agricultural and life sciences under the supervision of a faculty member. Projects may involve program planning, development, implementation, and evaluation. (S-U)
- SWS 4905 Individual Work** **1-3 Credits**
Selected topics for qualified students.
Prereq: 8 credits of soils and instructor permission
- SWS 4911 Supervised Research in Soil and Water Science** **3 Credits**
Firsthand, authentic research in soil and water science under the supervision of a faculty member. Projects may involve inquiry, design, investigation, scholarship, discovery or application. (S-U)
- SWS 4915 Honors Thesis Research in Soil and Water Science** **3 Credits**
Independent research in soil and water science leading to an honors thesis. Student will be mentored by a faculty member. Projects may involve inquiry, design, investigation, scholarship, discovery or application. (S-U)
Prereq: junior standing, upper division GPA of 3.75 or higher and completed honors thesis proposal on file
- SWS 4932 Special Topics in Soil and Water Science** **1-3 Credits**
Variable topics designed to meet students' needs and interests.
- SWS 4941 Full-time Practical Work Experience in Soil and Water Science** **1-3 Credits**
Practical work must be a new experience and related to field of study. (S-U)
Prereq: prior arrangement with advisor, and department and dean permissions
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