

SOIL, WATER, AND ECOSYSTEM SCIENCES

Soil, Water, and Ecosystem Sciences involves managing land and water resources across a wide range of ecosystems, including agricultural, forested, range, urban and wetlands. Students strengthen their knowledge of the discipline in the classroom, through hands-on learning in the lab, and in the field. The major prepares students with skills to address real-world challenges in soil, water, and ecosystem resource assessment and management to make a positive impact on the environment.

About this Program

- **College:** Agricultural and Life Sciences (<http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/>)
- **School:** Natural Resources and Environment (<http://catalog.ufl.edu/UGRD/colleges-schools/UGNTR/>)
- **Degree:** Bachelor of Science
- **Specializations:** Soil Science (http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/SWS_BS/SWS_BS01/) | Water Science (http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/SWS_BS/SWS_BS02/)
- **Credits for Degree:** 120
- **More Info:** Soil Science (<https://soils.ifas.ufl.edu/academics/-undergraduate-studies/soil-science-specialization/>) | Water Science (<https://soils.ifas.ufl.edu/academics/-undergraduate-studies/water-science-specialization/>)

To graduate with this major, students must complete all university, college, and major requirements.

Department Information

The Soil, Water, and Ecosystem Sciences Department researches and teaches about soil, water, and environmental sciences in urban, agricultural, and natural ecosystems. Since its origins over 100 years ago, the department has made significant contributions to improving the productivity of Florida's agriculture, helping protect the state's unique ecosystems, and contributing to soil and water science at national and international levels.

Website (<https://soils.ifas.ufl.edu/>)

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Map (<http://campusmap.ufl.edu/#/index/0495>)

Curriculum

- Combination Degrees
- Environmental Management in Agriculture and Natural Resources | Interdisciplinary Studies
- Interdisciplinary Studies | Environmental Management in Agriculture and Natural Resources UF Online
- Soil, Water, and Ecosystem Sciences
- Soil, Water, and Ecosystem Sciences Minor

Students are trained in managing land and water resources in a wide range of ecosystems, including agricultural, forested, range, urban and wetlands through different degree programs. Specializations within this degree program are designed to give the student a strong background in soil and water sciences with a core of required courses taken during their junior and senior years. Beyond the core courses, students can select from several groups of electives that provide flexibility in their program.

Students may also prepare for professional schools by selecting appropriate elective courses.

Specializations

Soil Science

Areas of study include soil and land use (with an emphasis on natural resources and the environment), environmental management (with an emphasis on agricultural and other applied aspects of soil sciences), physical and biological sciences (with an emphasis on physics, microbiology, botany, and other biological sciences) and business (with an emphasis on policy, economics, business administration, or entrepreneurship).

Water Science

Water's abundance, quality, distribution, and properties are essential to all people. Understanding water's role in the environment and in our lives is integral to the future of this important resource. Water science is an interdisciplinary specialization that provides students with opportunities to develop skills essential for a diversity of careers in both government and private sectors. Students work closely with advisors to develop a course of study tailored to their professional goals.

Academic Learning Compact

The Soil, Water, and Ecosystem Sciences major enables students to identify and to describe the morphology of soils, to differentiate soils according to soil taxonomy and to distinguish soil forming factors. Students will use this knowledge to assess properties of soils in relation to plant growth and environmental uses and to apply this knowledge to different soil uses in agriculture, natural resources and urban settings.

Before Graduating Students Must

- Pass the soil and water sciences competency exam, given in four parts. One part will be given in each of these required courses:
 - SWS 3022
 - SWS 4451
 - SWS 4602C
 - SWS 4715C
- Satisfactorily complete an approved research project in SWS 4905 or SWS 4941.
- Achieve minimum grades of C in AEC 3030C and AEC 3033C. These courses are graded using rubrics developed by a faculty team.
- Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to

Student Learning Outcomes | SLOs

Content

1. Apply fundamental principles of chemistry and physics in relation to critical zone processes in the pedosphere and hydrosphere.
2. Classify fundamental biological processes and differentiate basic organism function in soil and hydrologic systems.
3. Utilize field observations, case study evidence, and experimental data to describe soil formation, morphology, and interactions of the varied components of the hydrologic cycle.

Critical Thinking

4. Critically evaluate the sustainability of water resources in relation to human needs and natural ecosystem function.
5. Demonstrate quantitative problem-solving abilities by applying, analyzing, and synthesizing content knowledge related to soil and water chemistry and physics.

Communication

6. Create, interpret, and analyze written text, oral messages, and multimedia presentations used in agricultural and life sciences.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

Courses	SLO 1	SLO 2	SLO 3	SLO 4	SLO 5	SLO 6
AEC 3030C						I, R, A
AEC 3033C						I, R, A
SWS 2007	I	I	I	I		
SWS 3022	I	I	I		I	
SWS 4245	R, A		R, A	R, A	R	R
SWS 4303C		R, A				R
SWS 4307		R, A				R
SWS 4451	R, A				R, A	
SWS 4602C	R, A		R			
SWS 4715C			R, A			

Assessment Types

- Case studies
- Field studies
- Lab assignments and reports
- Written analysis
- Exams