

SOIL AND WATER SCIENCES

Students majoring in soil and water sciences complete core requirements that stress a balance between an application of fundamental science principles in relation to environmental and agricultural systems and a foundation in the humanities, social sciences, business and natural science. A capstone experience through which a student will gain employment skills needed to solve environmental and agricultural problems is required.

About this Program

- **College:** Agricultural and Life Sciences
- **School:** Natural Resources and Environment
- **Degree:** Bachelor of Science
- **Credits for Degree:** 120
- **Specializations:** Soil Science | Water Science
- **Additional Information:** Soil Science | Water Science
- **Related Soil and Water Sciences Programs**

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

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.

Related Soil and Water Sciences Programs

- Combined Degree
- Soil and Water Sciences minor

Academic Learning Compact

The soil and water 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 Soils in the Environment
 - SWS 4451 Soil and Water Chemistry
 - SWS 4602C Soil Physics
 - SWS 4715C Environmental Pedology
- 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 2007I		I	I	I		
SWS 3022I		I	I		I	
SWS 4245R, A			R, A	R, A	R	R
SWS 4303		R, A				R
SWS 4307		R, A				R
SWS 4451 R, A					R, A	
SWS 4602C, A			R			
SWS 4715			R, A			

Assessment Types

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