

Program Assessment Report
B.S. in ESWS
Crop, Soil, and Environmental Sciences
University of Arkansas
2020-2021

Program: B.S. in Environmental, Soil, and Water Science

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- **Results of analysis of assessment of Student Learning Outcome**

The Environmental, Soil, and Water Science (ESWS) degree-seeking students were evaluated for problem solving and writing skills during the 2020-2021 academic year. Problem solving was evaluated using a designated exercise in CSES 4224 Soil Fertility, which is one of the courses that can be selected from within the second soil science block. Eight upperclass ESWS students were enrolled in CSES 4224 during the fall 2020. Performance in solving a complex, multi-step, real-world computation and decision making problem-solving exercise was evaluated by the problem-solving rubric that included problem definition, strategy identification, solution proposition, solution evaluation, solution implementation, and outcome evaluation sections. Student ratings were basic to proficient for all students in all categories and met acceptable targets of 50% of students scoring proficient or greater for the following four categories: strategy identification, solution evaluation, solution implementation, and outcome evaluation. Fewer than 50% of ESWS students were able to define the problem or propose solutions, which may have been related to the content of the problem, given the broad nature of the ESWS degree program and the ability of students to select from among a variety of courses within the curriculum to meet degree requirements. A large proportion of students are transfer students, and therefore have a varied background among the sciences.

Twenty ESWS students were evaluated for writing skills in CSES 3263 Soil and Water Conservation using a semester-long writing assignment. Students had to research and describe a conservation issue and recommend management practices, activities, and/or physical structures to remedy the problem in a 10-15 page research paper. A five-part rubric was used to assess context and purpose, content development, discipline conventions, sources and evidence, and syntax and mechanics. Student skill levels were rated from unprepared/beginning to mastery in context and purpose, and content development, and from developing to proficient in discipline convention, sources and evidence, and syntax and mechanics. Acceptable targets of 50% of students scoring proficient or greater were met for all categories of writing skills except discipline conventions, in which only 30% of students scored proficient and the median rating was basic/developing. Given the lack of scientific literacy among U.S. citizens, this basic level may be of concern to measure among the upperclass undergraduate population of science students who are about to graduate.

- **Any changes to degree/certificate planned or made on the basis of the assessment and analysis**

The targets of problem solving and writing skills for assessment in the ESWS degree targeted important learning skill areas emphasized in particular courses and are important life skills. The lack of students achieving ideal targets means either that target levels are too high or that these outcomes need continued and perhaps additional emphasis in the curriculum. The suggestion is to continue emphasizing writing and problem solving throughout the curriculum and continue assessment in future years. The difficulties of dealing with COVID-19 during the past academic year may have affected student learner outcome performance, but these may also be difficult to determine with a small population of students and by assessing one problem solving exercise in a single course.

- **Any changes to the assessment process made or planned.**

Environmental, Soil, and Water Science faculty have been assessing critical thinking, problem solving, oral and written communication skills throughout the past several years. It may be beneficial, if possible to incorporate additional problem solving exercises from different courses. Faculty may also want to evaluate assessment results for indicators to guide and refine pre- and post-tests to develop some targeted, deeper probing into knowledge assessment areas.