Program Assessment Report (PAR)

Earth & Environmental Sciences (EES) Associate Degree

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ACADEMIC YEAR COVERED BY THIS REPORT: 2021-2022

I. PROGRAM LEARNING OUTCOMES

Graduates will demonstrate applied knowledge of fundamental concepts of earth and environmental sciences and solve problems applying that knowledge.

Graduates will demonstrate the ability to write in scientific format and demonstrate knowledge of the scientific method.

Graduates will demonstrate knowledge of fundamental methods to assess applications in EES field and laboratory techniques.

II. PROCEDURES USED FOR ASSESSMENT

A. Direct Assessment

Learning Outcome 3: Graduates will demonstrate knowledge of fundamental methods to assess applications in EES field and laboratory techniques.

* Students' comprehensive skills and knowledge of earth and environmental field and laboratory techniques were assessed through the collection of labs from EES 2510 and EES 2550. Labs were chosen that represent a broad spectrum of techniques and skills gained by a thorough training in EES courses. A sample of labs selected for analysis is included below:
   * Earth Systems (EES 2510) Labs Used in the Assessment

        * Mineral Identification
        * Earthquakes
        * Geologic Time
        * Stratigraphy

     * Earth History (EES 2550) Labs Used in the Assessment
        * Radiometric Ages
        * Index Fossils and Depositional Sequences
        * Interpretation of Geological Maps
        * Physical Correlation

Note that all artifacts are available upon request. Scores and interpretations are in sections below. Scores were collected and analyzed by faculty that teach in the program.

B. Scoring of Student Work

The scoring of student work for Learning Outcome 3 uses a grading rubric to assess a percentage score for each lab selected from EES 2510 and EES 2550. An overall passing percentage for each lab was calculated to assess the students' comprehension of specific EES techniques.

This current assessment includes all students registered for the Earth and Environmental Sciences AS degree during the school years of Fall 2019-Spring 2020, Fall 2020-Spring 2021, and Fall 2021-Spring 2022. Data from this time period includes a total of 6 students from EES 2510 and 5 students from EES 2550.

EES 2510 - Earth Systems

Labs

Student ID

Mineral Identification

Earthquakes

Geologic Time

Stratigraphy

Average (%)

Complete Lab Score (%)

S1

95.83

100.00

93.57

100.00

97.35

97.64

S2

95.83

95.00

82.86

100.00

93.42

85.32

S3

97.92

95.00

91.43

100.00

96.09

97.04

S4

93.75

92.50

94.29

96.67

94.30

87.56

S5

95.83

100.00

93.57

96.67

96.52

96.99

S6

100.00

100.00

99.17

100.00

99.79

99.93

Student Passing Rate (%)

96.53

97.08

92.48

98.89

96.25

94.08

EES 2550 - Earth History

Labs

Student ID	Radiometric Ages	Index Fossils and Depositional Sequences	Interpretation of Geological Maps	Physical Correlation	Average (%)	Complete Lab Score (%)
S1	88.89	0.00	0.00	92.50	45.35	61.56
S2	100.00	76.67	93.33	87.50	89.38	90.92
S3	100.00					

100.00

93.33

100.00

98.33

97.64

S4

100.00

95.00

96.67

90.00

95.42

97.20

S5

100.00

93.33

100.00

100.00

98.33

97.69

Student Passing Rate (%)

97.78

73.00

76.67

94.00

85.36

89.00

Student IDs are not the same students between EES 2510 and EES 2550

C. Indirect Assessment

Currently, there is no collected indirect assessment data. In the future, strong efforts will be made to compile both direct and indirect assessment data. Direct assessment will be collected and compiled via Pilot. An indirect assessment will be emailed to students via Qualtrics.

III. ASSESSMENT RESULTS/INFORMATION:

Six of the eight selected labs had a passing rate of 92% or higher, which suggests that students within the EES AS program have a strong grasp of laboratory techniques and knowledge. The two labs with lower passing rates, 73% and 76.67%, are still high but somewhat lower in average due to a student not completing these labs. Overall, the data suggests that students within the program develop an efficient and thorough set of laboratory skills which persist throughout their time in academia, as suggested with the continued high passing rate scores in both EES 2510 and EES 2550, taught in separate semesters. With one of the five students not turning in labs (representing 20% of the students), this suggests that future endeavors in the labs must continue to emphasize not only learning lab techniques, but also pursuing student retention and responsibility in turning in work.

For the school year of Fall 2021-Spring 2022, there was a graduation rate of 50% within the EES AS program. This data may be skewed due to matriculation of students into four-year programs, such as the Integrated Science Studies (ISS) program.

The graduation data is calculated based on enrolled students in each specified academic year. The percentage is a direct calculation of students enrolled to students graduated in that specific academic year. For instance, Fall 2021-Spring 2022 saw 4 students enrolled in the EES AS program, with two students graduating in the Spring 2022. The calculations were based on 2 out of the 4 students graduating, which comes out to 50%.

EES AS Graduates

Student Name

Graduation Term

James Flannery

Winter 2009

Emily Overman

Spring 2012

Laura Roediger

Spring 2013

Austin Smith

Spring 2015

Zachariah Whetstone

Spring 2015

Chad Mason

Spring 2016

Adam Bornhorst

Spring 2019

Hollie Kovacs

Fall 2019

Mason Kriegel

Spring 2020

Samuel Conklin

Spring 2021

Ryleigh Dye

Spring 2022

Margaret Patterson

[Summary]

[Analysis]

IV. ACTIONS TO IMPROVE STUDENT LEARNING

Constant efforts have been, and will continue to be, made to maintain and improve student learning within the EES AS program. These efforts include

* Providing instructional materials such as textbooks, hands-on laboratory and field resources, lectures, and other resources to ensure students are learning both conceptual and technical skills within the field of earth and environmental sciences.
* Continuing to teach students from a well-define curriculum that enables students to complete the learning outcomes of the program.
* Using, and increasing, the network of contacts with other universities, research facilities, and scientists to give students the opportunity to learn more in-depth skills, and find research and learning opportunities through graduate programs, internships, volunteering, and jobs.
* Establishing standardized rubrics for direct and indirect assessment purposes, and making better efforts to collect direct and indirect data that shows current student learning outcomes are being met and that graduates from the program are finding futures that are benefitted by the program.
* Encouraging students to develop abilities to problem-solve using the scientific method, and to create their own opportunities for researching issues within the realm of earth and environmental sciences.

V. SUPPORTING DOCUMENTS

Additional documentation, when provided, is stored in the internal Academic Program Assessment of Student Learning SharePoint site.