Academic Program Assessment Report

Assessment is a term commonly used to encompass the process of gathering and using evidence to guide improvements.

SACSCOC requires that an institution "identifies expected outcomes, assesses the extent to which it achieves these outcomes, and provides evidence of seeking improvement based on analysis of the results".

Be sure to SAVE your progress as you work!

Academic Program
Environmental Science, B.S.

Submission Year
2020-2021

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Program Goal

Goal

Goal 1

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
Students will demonstrate an understanding of the scientific basis (chemistry, biology, geology, basic environmental sciences) for environmental challenges and proposed solutions.

Pillar of Success Supported
Graduates Who Are Gainfully Employed or Admitted to Graduate School

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to content knowledge on the presentation, poster or written assignment rubric in ES 301, 302, 310, 407, 490, GEOL 405 or PSCI 499.

Timeframe for this Outcome
Academic year 2020-2021

Performance Target for "Met"
The mean of all student scores are at or above 2.0

Performance Target for "Partially Met"
The mean of all student scores are greater than 1.7 and less than 2.0

Performance Target for "Not Met"
The mean of all student scores are less than or equal to 1.7

Assessment Measure Used
Rubrics for posters, presentations and written assignments in ES 310, GEOL 405 and PSCI 499.

Frequency of Assessment
At the end of the semesters in which each of these courses are taught.

Data Collected for this Timeframe (Results)
The data collected were the presentation rubrics for the final presentations and the rubrics for written reports in ES 310 (n=6), and PSCI 499 (n=2). GEOL 405 final reports were used, but the assessment was a different mechanism, so was adjusted to reflect the written rubric (n=5)

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
The mean scores across all students and the three courses assessed on the item on the rubrics related to content knowledge was 2.11. This goal was met. No improvements are indicated necessary. The instructor of the course has students hand in several deliverables for evaluation prior to delivery of the final written and verbal reports. These include, at a minimum, an approved topic, outline for the project, draft report, final report, and presentation based on the final report. Detailed written comments are provided by the instructor as guidance for improvement. This approach has been shown to be effective and will be continued in all upper level ES courses indicated.

Spring 2020 courses switched from face to face instruction to all online due to the pandemic. This affected PSCI 499 and GEOL 405. This required changes in delivery and assessment format need be kept in mind when interpreting these results.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 2

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge,

skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to chemistry content knowledge on a locally designed environmental science exit exam.

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to chemistry.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and less than 50% on specific questions related to chemistry.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to chemistry.

Assessment Measure Used
A locally designed environmental science exit exam.

Frequency of Assessment
Every spring semester, offered in conjunction with PSCI 499 (Senior Seminar in Physical Science).

Data Collected for this Timeframe (Results)
Students were not assessed this year with the described instrument. The exam would have been given in late Spring term, after a change to online teaching.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
This instrument was not implemented in the current assessment cycle. The Exit Exam would normally be given late in Spring Term as a part of PSCI 499. The pandemic resulted in all courses going online and the students sent home, making it difficult to implement the exam in the same way. Further, only two ES majors were enrolled in PSCI 499, so the results would be statistically suspect. Temporal trends would also have been meaningless due to the different delivery of the final term of courses and the necessity of a different delivery format of the exam, should an attempt have been made. So, this learning objective was not assessed using this instrument.

Because the chemistry related content of chemistry courses and ES curriculum has changed from time to time, a process is in place to review the questions on the exam to ensure that they reflect the major concepts taught in the four (4) to six (6) chemistry courses Environmental Science program students complete, as well as the chemistry related content in ES courses. Going forward, for students who

have entered the program after 2018, new students will have to complete Environmental Chemistry (CHEM 420) as a core course, among a total of five chemistry courses (inclusive of CHEM 420) rather than having it be completed by some students as one option of several ES related electives. This is anticipated to improve the mean performance on this learning objective even further.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 3

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to biology content knowledge on a locally designed exit exam.

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to biology.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and less than 50% on specific questions related to biology.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to biology.

Assessment Measure Used
A locally designed environmental science exit exam.

Frequency of Assessment
Every spring semester, offered in conjunction with PSCI 499 (Senior Seminar in Physical Science).

Data Collected for this Timeframe (Results)
Students were not assessed this year with the described instrument. The exam would have been given in late Spring term, after a change to online

Score (Met=3, Partially Met=2, Not Met=1)
3

teaching.

Comments/Narrative
This instrument was not implemented in the current assessment cycle. The Exit Exam would normally be given late in Spring Term as a part of PSCI 499. The pandemic resulted in all courses going online and the students sent home, making it difficult to implement the exam in the same way. Further, only two ES majors were enrolled in PSCI 499, so the results would be statistically suspect. Temporal trends would also have been meaningless due to the different delivery of the final term of courses and the necessity of a different delivery format of the exam, should an attempt have been made. So, this learning objective was not assessed using this instrument.
Because the biology related content of biology courses and ES curriculum has changed from time to time, a process is in place to review the questions on the exam to ensure that they reflect the major concepts taught in the three (3) to five (5) biology courses Environmental Science program students complete, as well as the biology related content in ES courses.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 4

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to geology content knowledge on a locally designed exit exam.

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to geology.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 50% on specific questions related to geology.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to

geology.

Assessment Measure Used
A locally designed environmental science exit exam

Frequency of Assessment
Every spring semester, offered in conjunction with PSCI 499 (Senior Seminar in Physical Science)

Data Collected for this Timeframe (Results)
Students were not assessed this year with the described instrument. The exam would have been given in late Spring term, after a change to online teaching.

Score (Met=3, Partially Met=2, Not Met=1)
2

Comments/Narrative
This instrument was not implemented in the current assessment cycle. The Exit Exam would normally be given late in Spring Term as a part of PSCI 499. The pandemic resulted in all courses going online and the students sent home, making it difficult to implement the exam in the same way. Further, only two ES majors were enrolled in PSCI 499, so the results would be statistically suspect. Temporal trends would also have been meaningless due to the different delivery of the final term of courses and the necessity of a different delivery format of the exam, should an attempt have been made. So, this learning objective was not assessed using this instrument.

The exam will be reviewed against the content of the courses which are covered. Appropriate changes will be made to the exam.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 5

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to general environmental science content knowledge on a locally designed exit exam.

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to general environmental science.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and equal to or less that 50% on specific questions related to general environmental science.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to general environmental science.

Assessment Measure Used
A locally designed environmental science exit exam

Frequency of Assessment
Every spring semester, offered in conjunction with PSCI 499 (Senior Seminar in Physical Science)

Data Collected for this Timeframe (Results)
Students were not assessed this year with the described instrument. The exam would have been given in late Spring term, after a change to online teaching.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
This instrument was not implemented in the current assessment cycle. The Exit Exam would normally be given late in Spring Term as a part of PSCI 499. The pandemic resulted in all courses going online and the students sent home, making it difficult to implement the exam in the same way. Further, only two ES majors were enrolled in PSCI 499, so the results would be statistically suspect. Temporal trends would also have been meaningless due to the different delivery of the final term of courses and the necessity of a different delivery format of the exam, should an attempt have been made. So, this learning objective was not assessed using this instrument.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
Only the first learning outcome under this goal was assessed this assessment cycle. The Exit Exam was not given due to challenges associated with the pandemic and the fact that only two ES students were enrolled in the course in which the Exit Exam is normally given (PSCI 499).

According to the first learning outcome, the goal was met.

It should be noted, that in the last three academic years, there have been changes in the ES curriculum, the Biology curriculum and Chemistry curriculum, and well as the general education curriculum at Lander University. In future assessments, the impacts of these changed curriculum requirements will be felt.

The ES curriculum added two core course requirements, ES 111 (Sustainability) and CHEM 420 (Environmental Chemistry). These course requirements should lead to improvement in general ES knowledge and knowledge in Chemistry, beginning with the AY 2021-2022, with the first ES students to

start graduating with one or both requirements changed.

Changes Made/Proposed Related to Goal
No changes were made as a result of this assessment cycle and this objective. It should be noted that, due to continuation of response to the pandemic, all Fall term 2020 courses have been brought online for the first time. In that process, for all courses, significant improvements have been made in the detail and amount of content available to students in Blackboard. Lecture slides were improved. All lectures narrated (for the first time). Additional assessments were added to these ES courses, most notably more than 1 quiz per week on average and several, short, written and online discussion assignments. Students have already provided positive feedback regarding these modifications. Depending how the next assessment cycle works out, some of these changes may be saved or expanded upon once courses return to regular delivery (face-to-face).

Upload Rubrics/Other Files
ES Rubric (Project Written Report) (2014).docx

Rubric (ES) - Presentation.doc

Goal 2

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
Students will demonstrate the ability to use the scientific method and associated critical thinking skills to formulate questions, design experiments and interpret and evaluate data to answer them.

Pillar of Success Supported
Graduates Who Are Gainfully Employed or Admitted to Graduate School

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
Mean scores of the portions of a written research report, presentation or poster rubric that ask reviewers to assess critical thinking skills and use of the scientific method in semester assignments in ES 310/302, 310, 407, 490, GEOL 405 or PSCI 499.

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean of all student scores are at or above 2.0

Performance Target for "Partially Met"
The mean of all student scores are above 1.7 and less than 2.0.

Performance Target for "Not Met"
The mean of all student scores are less than 1.7

Assessment Measure Used
Mean score of the portions of a written research report and rubric that ask reviewers to assess critical thinking skills and use of the scientific method in semester assignments in ES 301, ES 302, ES 310, GEOL 405 or PSCI 499

Frequency of Assessment
ES 301, ES 302, ES 310 and GEOL 405 are offered every other year. ES 310 and GEOL 405 were offered in Academic Year 2019-2030. PSCI 499 is offered every Spring term.

Data Collected for this Timeframe (Results)
Mean score of the portions of a written research report and rubric that ask reviewers to assess critical thinking skills and use of the scientific method in semester assignments in ES 310, GEOL 405, and PSCI 499. (N=13). The mean score was 2.03.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
The goal was met, according to this student learning outcome. The semester projects completed in ES 310 and GEOL 405 were individual projects.

It should be noted that the scores for PSCI 499, based on only two students, would not have met the outcome objective. However, it should be noted that the scores of the ES students in the course averaged more than those of the Chemistry majors in the course. The fact that spring term courses were completed online, as a result of Lander's response to the pandemic, may have had much to do with the lower numbers. Student presentations made for PSCI 499 were conducted online, a format that students were unfamiliar with.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 2

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of

performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions requiring students to demonstrate critical thinking and/or use the scientific method on a locally written environmental science exit exam

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to this indicator of success.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and equal to or less than 50% on specific questions related to this indicator of success.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to this indicator of success.

Assessment Measure Used
A locally written environmental science exit exam.

Frequency of Assessment
This assessment instrument is administered every spring term in conjunction with PSCI 499.

Data Collected for this Timeframe (Results)
Students were not assessed this year with the described instrument. The exam would have been given in late Spring term, after a change to online teaching.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
This instrument was not implemented in the current assessment cycle. The Exit Exam would normally be given late in Spring Term as a part of PSCI 499. The pandemic resulted in all courses going online and the students sent home, making it difficult to implement the exam in the same way. Further, only two ES majors were enrolled in PSCI 499, so the results would be statistically suspect. Temporal trends would also have been meaningless due to the different delivery of the final term of courses and the necessity of a different delivery format of the exam, should an attempt have been made. So, this learning objective was not assessed using this instrument.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 3

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores of the portion of the supervisor completed rubric for internships (ES 490) related to critical thinking and/or the use of the scientific method

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean score of all student scores is greater than 3.6 on the relevant section of the supervisor completed rubric for internships in environmental science (A. Problem Solving/Inquiry) .

Performance Target for "Partially Met"
The mean score of all student scores is greater than 3.0 and less than 3.6 on the relevant section of the supervisor completed rubric for internships in environmental science (A. Problem Solving/Inquiry) .

Performance Target for "Not Met"
The mean score of all student scores is less than 3.0 on the relevant section of the supervisor completed rubric for internships in environmental science (A. Problem Solving/Inquiry) .

Assessment Measure Used
A supervisor completed rubric for environmental science internships (ES 490). This is the rubric used in the Lander University EYE Program

Frequency of Assessment
Completed at the end of each environmental science internship, which is offered on demand in the program.

Data Collected for this Timeframe (Results)
No students completed internships in environmental science in this assessment interval.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
No students completed environmental internships over the current assessment period. Three factors were involved in that. 1. There were not many students ready to do an internship. The two students who were ready were unable to find appropriate internships due to the COVID 19. Two other students who may have completed an internship had planned study abroad. They plan to try to find an internship in the next assessment period.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
Only one of the three learning outcomes (assessment instruments) for this goal were completed for this assessment period. This goal was met, according to that learning outcome.

It is an asterisk year, no doubt.

Changes Made/Proposed Related to Goal
Students have met this goal, despite being unable to complete two of the three planned assessment instruments. The program strengths include a 1 year project in ES 301 and ES 302 that requires teams of students to address a 'real world' environmental challenge, which includes field , lab and/or data mining components. This will continue and be developed to address challenges that have come up each time, such as how team and time management can be improved for the project teams. Every upper level course in ES requires a research project with multiple deliverables, and critical thinking is front and center of each of those research projects. All research projects of this sort require a paper and a presentation. The paper is first turned in as a draft, allowing students to make improvements, including the collection of additional data/information, if necessary. All projects go through an initial problem definition stage, which requires high levels of critical thinking and framing consistent with the scientific method. These strengths will continue and be built upon in the future.

Upload Rubrics/Other Files

Goal 3

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
Students will demonstrate the development of writing and presentation skills appropriate for students and practitioners in the discipline of environmental science.

Pillar of Success Supported
Graduates Who Are Gainfully Employed or Admitted to Graduate School

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention,

employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
Mean scores on questions related to the demonstration of writing or presentation skills on assignment rubrics from ES 301/302, ES 310, ES 407, GEOL 405 or PSCI 499.

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean or all students scores is at or above 2.0

Performance Target for "Partially Met"
The mean or all students scores is above 1.7 and below 2.0

Performance Target for "Not Met"
The mean or all students scores is less than or equal to 1.7.

Assessment Measure Used
Presentation rubrics in ES 301, ES 302, ES 310 and GEOL 405, plus PSCI 499. And written report rubrics in ES 310, ES 301, ES 302 and GEOL 405.

Frequency of Assessment
Each of these courses is offered every other year (except PSCI 499, which is offered every Spring semester). Assessments are completed in at least two courses each academic year, with specific courses alternating.

Data Collected for this Timeframe (Results)
Presentation rubrics in ES 310 (N=6) and PSCI 499 (N=2), and written report rubric scores for ES 301 (N=6). Projected rubric scores from overall grades for the final reports in GEOL 405 (N=6) were made because of different delivery method during spring term following a quick move to all online instruction. The average for all of these measures was 2.45 (N=20). For written communication, the mean was 2.52 (N=12). For presentations, the mean was 2.35 (N=8)

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
The goal was met according to this learning outcome. Presentation skills had a mean score of 2.35 while written communications skills had a mean of 2.52, both similar in number. It is expected that the written communication skills would be a little higher because multiple deliverables were required for the written report, complete with detailed, instructor written feedback for improvements. Presentations were not evaluated in draft or preliminary form, so there was no real opportunity for improvement following feedback.

These scores suggest that course embedded communications assignments, written and presentation, are working quite well in the environmental science program. No additional improvement is indicated by

the results of this learning outcome.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 2

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
Mean scores on questions related to the demonstration of presentation skills on a presentation rubric from ES 490 (Internship) or ES 407 (Research).

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean or all students scores is at or above 2.0

Performance Target for "Partially Met"
The mean or all students scores is above 1.7 and below 2.0

Performance Target for "Not Met"
The mean or all students scores is less than or equal to 1.7.

Assessment Measure Used
Mean scores on questions related to the demonstration of presentation skills on a presentation rubric from ES 490 (Internship)

Frequency of Assessment
Both ES 490 and ES 407 are available on demand for juniors or seniors. Seniors most frequently pursue ES 490 (internship).

Data Collected for this Timeframe (Results)
No internships or research projects were completed for this assessment period.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
No internships or research projects were completed for this assessment period.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 3

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores of the portion of the supervisor completed rubric for internships (ES 490) related to written or verbal communication.

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean score of all student scores is greater than 3.6 on the relevant section of the supervisor completed rubric for internships in environmental science (B. Communications) .

Performance Target for "Partially Met"
The mean score of all student scores is greater than 3.0 and less than 3.6 on the relevant section of the supervisor completed rubric for internships in environmental science (B. Communications) .

Performance Target for "Not Met"
The mean score of all student scores is less than 3.0 on the relevant section of the supervisor completed rubric for internships in environmental science (B.Communications)

Assessment Measure Used
A supervisor completed rubric for environmental science internships (ES 490). . This is the rubric used in the Lander University EYE Program

Frequency of Assessment
Completed at the end of each environmental science internship, which is offered on demand in the program.

Data Collected for this Timeframe (Results)
No internships were completed in the assessment period, so no rubrics were available.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
No internships were completed in the assessment period, so no rubrics were available.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
All students met the learning outcome for the one assessment completed during this assessment period.. This is not surprising given the effort and focus of program and department faculty on written and verbal communications skills in many of the classes, plus internships, research and PSCI 499 presentations. This is an area of strength to keep and develop for this program.

Due to COVID 19 and the fact that no students completed an internship or research project this assessment interval, none of the other four learning outcomes for this goal were assessed.

Changes Made/Proposed Related to Goal
No specific changes will be made to the program based on this goal. Presentations to outside conferences, such as the Upstate Research Symposium, as well as presentations to the Academic Symposium at Lander, are encouraged at several points in the environmental science program. This will continue.

Upload Rubrics/Other Files

Goal 4

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
Students will develop an ability to develop and articulate well informed and reasoned views on environmental issues, based on an understanding of legal, ethical, social, political and economic ramifications of environmental problems, policies and decisions.

Pillar of Success Supported
Graduates Who Are Gainfully Employed or Admitted to Graduate School

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?

Student Learning Outcome

Enter Outcome
Mean score on portions of a locally written environmental science exit exam assessing student demonstration of developing and articulating well informed and reasoned views on legal, ethical, social and political ramifications of environmental problems, policies and decisions.

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
The mean score of all student scores for the sum of the selected questions is greater than 50%.

Performance Target for "Partially Met"
The mean score of all student scores for the sum of the selected questions is greater than 35% and equal to or less than 50%..

Performance Target for "Not Met"
The mean score of all student scores for the sum of the selected questions is less than 35%.

Assessment Measure Used
Selected questions on a locally written environmental science exit exam.

Frequency of Assessment
The exam is given each spring semester in conjunction with PSCI 499, the senior seminar for the Department of Physical Sciences, a class which includes graduating seniors in both the Environmental Science and Chemistry programs..

Data Collected for this Timeframe (Results)
No data were collected relative to this learning outcome. Due to response to COVID 19, the exit exam was not given to the two students in the PSCI 499 course.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
There were no data to analyze according to this learning outcome from the assessment period.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
This goal was not assessed during the assessment period.

Despite this, a change is proposed to both the program and the assessment. First, a second learning outcome will be added to the assessment of this Goal 4, though its first implementation is not likely until the academic year 2020-2021. This assessment would be based on a new, course embedded project, most likely in ES 302 (possibly ES 301). ES 301/ES 302 are the only courses in the Environmental Science curriculum in which such an assignment would be instructive. The goal calls for integration of content, thinking and approaches across several disciplines to address a major environmental challenge.

These two courses do cover aspects of these other disciplines (economics, social science, political and legal systems) related to environmental challenges (economy, social systems, political systems).

Beginning in Fall 2019, new students in the Environmental Science program were required to take ES 111, a course in sustainability that introduces students to the evaluation of environmental challenges by separately considering the environmental, social and economic aspects of the challenges. This presents an opportunity for ES 301/ES 302 to build from this background (prhaps as early as 2020-2021), allowing those courses to be taught at a higher level in those disciplines. ES 111 occurs too early in the program to be used for program assessment, being a freshman level course.

ES 301 and ES 302 are offered every other year, so the next time they will be offered will be in academic year 2020-2021. At that time, issue papers in ES 302, will be required. This will be in addition to the team research projects that have worked so well in the past with the scientific method goal. A way will need to be found to do both, such that students are not overwhelmed with the amount of work required in either course.

Changes Made/Proposed Related to Goal
A proposed change to the assessment is to add a second student outcome, to reflect a new, course embedded project in ES 301 or ES 302, which will next be offered in academic year 2020-2021. This will build upon the learning that takes place in ES 111, a new course that is required of ES students beginning with the Fall 2019 entering class.

Upload Rubrics/Other Files

Goal 5

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
To comply with Program Productivity standards as defined by the South Carolina Commission on Higher Education

Pillar of Success Supported
High-Demand, Market-Driven Programs

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?

Operational Outcome

Enter Outcome
Major Enrollment

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
Using a five-year rolling average, the number of students enrolled in the major for Baccalaureate programs is greater than or equal to 12.5,

Performance Target for "Partially Met"
Not Applicable

Performance Target for "Not Met"
Using a five-year rolling average, the number of students enrolled in the major for Baccalaureate programs is less than 12.5.

Assessment Measure Used
Enrollment and Graduation data extracted from Banner

Frequency of Assessment
Annually

Data Collected for this Timeframe (Results)
The five-year rolling mean for student enrollment was 14.8

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
The goal was met according to this operational outcome. No changes are indicated. There does seem to be some progress, however. The enrollment in 2018-2019 was 20 students, while that in 2017-2018 was 11, with the previous three years below 15. This increase in enrollment numbers in the Environmental Science program seems to reflect the total increase in enrollment at Lander University.

A few minor changes to the program should add to enrollment numbers. The first is that, for the first time in spring 2019, ES 111, a freshman level course in environmental sustainability, was added to the curriculum. This course meets the general education science requirement for a non-lab science course. It attracts students from across campus. The reason this might be an effective recruitment opportunity is that most students at Lander are unaware of the major, and very few are even aware of environmental science as an educational or career opportunity, given the short shrift this discipline has been given on South Carolina's career cluster scheme that is used by guidance counselors in public schools. Further, there has been a trend of high schools discontinuing environmental science courses in South Carolina due to low enrollment. Recruiting for this vital field has always been a challenge for these reasons. ES 111 may make a difference.

The second recent change is the approval of an addition of an area of concentration in Environmental Forensics, which takes advantage of new courses offered in forensic science at Lander University. This area of concentration was approved by CHE during the summer of 2019. This should broaden the interest of students in ES.

A third factor is that the student group, Environmental Science Student Organization (ESSO) has expanded in membership over the last two years. This will put more students in touch with the program and should lead to more interest in the major.

A fourth item is, that in the last three years or so, there has been an increase in Biology students earning minors in ES, with two recently graduating with double majors in Biology and ES. This trend is expected to continue, given that it has support among faculty in Biology as well as the department and college. All of these factors, taken together, should lead to continued growth of the Environmental Science program.

Nevertheless, additional recruiting opportunities will be sought. One potential opportunity would be the celebration of the 50th anniversary of Earth Day coming up during Spring 2020.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Outcome 2

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Operational Outcome

Enter Outcome
Completions (Degrees Awarded

Timeframe for this Outcome
Academic Year 2020-2021

Performance Target for "Met"
Using a five-year rolling average, the number of degrees awarded for Baccalaureate programs is greater than or equal to 8.

Performance Target for "Partially Met"
Not Applicable

Performance Target for "Not Met"
Using a five-year rolling average, the number of degrees awarded for Baccalaureate programs is less than 8.

Assessment Measure Used
Enrollment and Graduation data extracted from Banner

Frequency of Assessment
Annually

Data Collected for this Timeframe (Results)

Score (Met=3, Partially Met=2, Not Met=1)

The five-year rolling average for degrees earned was 3.0 for this assessment period. 1

Comments/Narrative

This goal was not met for this operational outcome, at 3.0 versus a requirement of 8 degrees awarded, based on a five-year rolling average. There are two possible explanations for this result, 1) low total enrollment, although they met the requirement, are still not sufficiently high to lead to an expectation that the program would graduate the minimum of 8 students, and b) graduation rates for the program are low. In analyzing the data, the first alternative seems most likely to be responsible for the program not meeting this goal. For example, a program that just meets the 8 degrees awarded requirement, in a four year program, would have no fewer than 32 students, with an award rate of 100% of incoming students. The Environmental Science program had a total of 14.8 students in the five-yeal rolling average. Assuming equal numbers in all four grades and a 100% degree award rate, we would expect a five-year rolling average of 3.7 degrees awarded. This is close to the result obtained The takeaway from that is that the Environmental Science Program is doing a very good job graduating students in the program, but that the total numbers are not high enough to guarantee success against this requirement for 8 degrees awarded.

The implication of this for Environmental Science is that the program is actually doing quite well to help students complete their degrees. The challenge, rather, is that total student enrollment numbers should target the upper twenties to low thirties to reliably meet this goal.. In other words, this assessment leads one to believe that this is more a recruiting challenge than an academic performance or retention challenge.

We anticipate total student numbers in the program, and consequently total degrees awarded, to increase over the next few years based on improved total student enrollment numbers at Lander University and other factors and recent changes to the Environmental science program.

A few minor changes to the program already implemented should add to enrollment numbers. The first is that, for the first time in spring 2019, ES 111, a freshman level course in environmental sustainability, was added to the curriculum. This course meets the general education science requirement for a non-lab science course. It attracts students from across campus. The reason this might be an effective recruitment opportunity is that most students at Lander are unaware of the major, and very few are even aware of environmental science as an educational or career opportunity, given the short shrift this discipline has on South Carolina's career cluster scheme that is used by guidance counselors. Further, there has been a trend of schools discontinuing environmental science courses in high school in South Carolina due to low enrollment. Recruiting for this vital field has always been a challenge for these reasons. ES 111 may make a difference.

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A fourth item is, that in the last three years or so, there has been an increase in Biology students earning minors in ES, with two recently graduating with double majors in Biology and ES. This trend is expected to continue, given that it has support among faculty in Biology as well as the department and college. All of these factors, taken together, should lead to continued growth of the Environmental Science program.

Resources Needed to Meet/Sustain Results

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
This goal was not met. Although the goal of student enrollment in the program was met, the number of degrees awarded is below the requirement. Based on a more detailed analysis of the enrollment and degrees awarded data, it is apparent that the challenge is more one of recruiting students to the program than a lack of success in having students reach graduation. In fact, the Environmental Science program is above average among baccalaureate programs at Lander University in terms of awarding degrees as a proportion of the students enrolled in the program.

Recent changes in the ES program are expected to increase enrollment numbers. These include the addition of a freshman, general education science course (ES 111) that will provide students who may not have firmly decided which major to pursue an opportunity to 'taste' what environmental science has to offer. This course was offered at Lander University for the first time during spring of 2019.

A recently approved concentration in environmental science, Environmental Forensics, was placed in the 2020-2021 academic catalog, which is expected to attract students with an interest in forensic science and environmental issues.

In addition to academic changes to the program and course offerings, the Environmental Science Student Organization has been growing in membership. This provides an opportunity for recruitment into the major.

There has also been a recent trend of Biology majors pursuing environmental science minors, and the first Biology and Environmental science double majors have graduated recently. Biology faculty appear to approve and support ES minors and the double major for interested and qualified students. This is an example of an effective, cross-discipline relationship. Environmental Science minors are also occasionally pursued by Chemistry majors, but none have yet considered the double major as a possibility in recent memory, though it is feasible.

As a last comment, the ES program is one that appears to be doing quite well in terms of awarding degrees and in placing graduates in positions related to the discipline. It addresses a need in the state. Yet, recruitment has been a long challenge with this program. The challenges seem to be more related to the lack of awareness of environmental science as a potential area of study and a good career option. This challenge goes to the K-12 school system in the state and public lack of understanding of what environmental science is and does. This implies that a significant and sustained outreach effort will be needed over the longer term to effect sustained increase in this and other environmental science related programs in the state.

Changes Made/Proposed Related to Goal
Recent changes in the ES program are expected to increase enrollment numbers. These include the addition of a freshman, general education science course (ES 111) that will provide students who may not have firmly decided which major to pursue an opportunity to 'taste' what environmental science has to offer. This course was offered at Lander University for the first time during spring of 2019. A recently approved concentration in environmental science, Environmental Forensics, was placed in the 2020-2021 academic catalog, which is expected to attract students with an interest in forensic science and environmental issues.

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A sustained outreach and recruiting program would likely need to be initiated for longer term success. This will involve working with the appropriate areas of administration to effect. Opportunities may include magazine or newspaper articles, a blog or other web site dedicated to the major, public outreach such as events celebrating the 50th anniversary of the first Earth Day, active presence of the program on high school college and/or career days, communications with high school science teachers and guidance councilors, and other opportunities. It is not currently anticipated that significant, new resources would be required to do these things.

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