

Degree Program Name: B.S. Science Education **Contact Name and Email:** Eulsun Seung, Eulsun.seung@indstate.edu

Before you complete the form below, review your outcomes library and curriculum map to ensure that they are accurate and up to date. If not, you may submit a new version along with this summary.

Part One

<p>a. What learning outcomes did you assess this year?</p> <p>If this is a graduate program, indicate the Graduate Student Learning Outcome* each outcome aligns with.</p>	<p>b. (1) What method(s) did you use to determine how well your students attained the outcome? (2) In what course or other required experience did the assessment occur?</p>	<p>c. What expectations did you establish for achievement of the outcome?</p>	<p>d. What were the actual results?</p>	<p>e. (1) Who was responsible for collecting and analyzing the results? (2) How were they shared with the program's faculty?</p>
<p>1.1 (a). Understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world.</p>	<p>(1) Nature of Science Lesson plans</p> <p>(2) SCED402 (Spring)</p>	<p>All students enrolled in SCED 402 (5 students) should Meet Expectations (M) or Exceed Expectations (E) on the components of their three lesson plans to teach the Nature of Science. The achievement was evaluated based on the rubric (Rubric #1).</p>	<p>NOS Lesson plan</p> <ul style="list-style-type: none"> • Standards: E(4) M(1) D(0) • Objectives: E(5) M(0) D(0) • Inquiry activity: E(4), M(1), D(0) • Learning procedure: E(5), M(0), D(0) 	<p>(1) Eulsun Seung, instructor of SCED402</p> <p>(2) No other faculty in our program</p>
<p>1.1 (b). Engage students in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science.</p>	<p>(1) Teaching portfolio</p> <ul style="list-style-type: none"> • Nature of Science <p>(2) SCED398L (Fall)</p>	<p>All students enrolled in SCED 398L (4 students) should Meet Expectations (M) or Exceed Expectations (E) on the Nature of Science section in their teaching portfolio (Rubric #2).</p>	<p>Teaching portfolio</p> <ul style="list-style-type: none"> • Nature of Science: E(4) M(0) D(0) 	<p>(1) Eulsun Seung, instructor of SCED 398L</p> <p>(2) No other faculty in our program</p>

1.2 (a). Understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance/disposal	(1) Teaching portfolio <ul style="list-style-type: none"> • Safety and welfare Student teaching evaluation <ul style="list-style-type: none"> • Safety and welfare (2) SCED 402 (Spring)	All students enrolled in SCED 402 (5 students) should Meet Expectations (M) or Exceed Expectations (E) on related components of the teaching portfolio (Rubric #2) and student teaching evaluation	Teaching portfolio <ul style="list-style-type: none"> • Safety and welfare: E(5) M(0) D(0) Student teaching evaluation <ul style="list-style-type: none"> • Safety and welfare: E(4) M(1) D(0) 	(1) Eulsun Seung, instructor of SCED402 (2) No other faculty in our program
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of materials.		(Rubric #3).		
1.2 (b). Know and practice proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction.	(1) Safety module (2) SCED398L (Fall)	All students enrolled in SCED 398L (4 students) should Meet Expectations (M) or Exceed Expectations (E) on the three components of the safety module (Rubric #4).	Safety module <ul style="list-style-type: none"> • Safety guidelines : E(4) M(0) D(0) • Safety contracts: E(4) M(0) D(0) • Safety design/plan: E(3) M(1) D(0) 	(1) Eulsun Seung, instructor of SCED 398L (2) No other faculty in our program
1.2 (c). Know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the ability of students.	(1) Safety quiz (2) SCED398L (Fall)	All students enrolled in SCED 398L (4 students) should receive a minimum of 90% scores on their safety quiz.	Safety quiz * All four students received 90-100% on the safety quiz.	(1) Eulsun Seung, instructor of SCED 398L (2) No other faculty in our program
2.2 (a) Understand socially important issues related to science and technology, as well as processes used to analyze and make decisions on such issues.	(1) Teaching portfolio <ul style="list-style-type: none"> • Issue/problem analysis (2) SCED398L (Fall)	All students enrolled in SCED 398L (4 students) should Meet Expectations (M) or Exceed Expectations (E) on related components of teaching portfolio. The achievement was evaluated based on the rubric (Rubric #2).	Teaching portfolio <ul style="list-style-type: none"> • Issue/problem solving: E(4) M(0) D(0) 	(1) Eulsun Seung, instructor of SCED 398L (2) No other faculty in our program

2.2 (b) Engage students in the analysis of problems, including consideration of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students.	(1) Alternative energy project (2) SCED398L (Fall)	All students enrolled in SCED 398L (4 students) should Meet Expectations (M) or Exceed Expectations (E) on the three components of their Alternative energy project. The achievement was evaluated based on the rubric (Rubric #5).	Alternative energy project <ul style="list-style-type: none"> • Alternative energy summary E(4) M(0) D(0) • Proposal: E(4) M(0) D(0) • Presentation: E(4) M(0) D(0) 	(1) Eulsun Seung, instructor of SCED 398L (2) No other faculty in our program
2.3 (a). Identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science.	(1) Teaching portfolio <ul style="list-style-type: none"> • Science in the community (2) SCED398L (Fall)	All students enrolled in SCED 398L (4 students) should Meet Expectations (M) or Exceed Expectations (E) on related components of teaching portfolio. The achievement was evaluated based on the rubric (Rubric #2).	Teaching portfolio <ul style="list-style-type: none"> • Science in the community: E(3) M(1) D(0) 	(1) Eulsun Seung, instructor of SCED 398L (2) No other faculty in our program
2.3 (b). Involve students in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community.	(1) Community resource project (2) SCED398L (Fall)	All students enrolled in SCED 398L (4 students) should Meet Expectations (M) or Exceed Expectations (E) on the four components of their community resource project. The achievement was evaluated based on the rubric (Rubric #6).	Community resource project <ul style="list-style-type: none"> • Number of resources: E(4) M(0) D(0) • Information of resources: E(4) M(0) D(0) • Connection to grade level/curriculum: E(4) M(0) D(0) • Plan to use: E(2) M(2) D(0) 	(1) Eulsun Seung, instructor of SCED 398L (2) No other faculty in our program

* See <https://www2.indstate.edu/graduate/forms/review.pdf>

If you would like to report on more than three outcomes, place the cursor in the last cell on the right and hit "tab" to add a new row.

Part Two

If you would like to reference any supporting materials (departmental meeting minutes, detailed assessment results, etc.), please provide the URL at which they can be found.
<L:\College of Arts and Sciences\Science Education - Faculty-Staff\Rubrics>

Science Education students are required to take two science methods courses: SCED396L and SCED398L in their junior and senior year. After taking these two courses, they are eligible to take the student teaching course (SCED402). Currently we have 27 students in the Science Education program, and only 4 students were enrolled in SCED 398L in Fall 2016 and 5 students in SCED 402 in Spring 2017. Most of the learning outcomes in this report are assessed via students' teaching portfolio (SCED398L and SCED402), lesson plans (SCED402), quiz (SCED398L), and student projects (SCED 398L).

For the teaching portfolio, students collect evidence of their growth and achievement throughout the three semesters, during which they take the two science methods courses (i.e., SCED396L and SCED398L) and student teaching (SCED402). The ten sections of the teaching portfolio were selected to meet the NSTA standards and topics of SCED396L and SCED398L. The teaching portfolio is assessed three times; at the end of SCED396L, SCED398L, and SCED402. Here, we present the assessment data, which we collected at the end of SCED398L in Fall2016 and SCED402 in Spring 2017. Three student projects (i.e., Safety module, Alternative energy project, and Community resource project), Nature of Science lesson plans, safety quiz, and student teaching evaluation are also used to assess if our learning outcomes are accomplished during SCED398L and SCED402.

This report presents the assessment data for the nine learning outcomes. These nine learning outcomes directly and consistently measure our students' professional knowledge for teaching science. For the two learning outcomes (i.e., 1.1 (a) and 1.2(a)) related to SCED402, all five students were evaluated as Exceed Expectations (E) or Meet Expectations (M) on related components of their Nature of Science lesson plans, teaching portfolio, and student teaching evaluation. For the other seven learning outcomes (i.e., 1.1(b), 1.2(b), 1.2(c), 2.2(a), 2.2(b), 2.3(a), and 2.3(b)) related to SCED398L, all four students were evaluated as Meet Expectations (M) or Exceed Expectations (E), or 80 out of 100 points on related components of their teaching portfolio, quiz, or class projects. The assessment data show that our students have strong pedagogical content knowledge for teaching science regarding the Nature of Science, Safety and welfare, Issues in science, and Community in science. Most data are from formative performance assessments, which can provide more authentic and alternative data regarding our science education majors' professional knowledge for teaching science. Since we have only a few number of students in the class, it's easy to maintain the quality of student products. As I prepare this report, I realize that in addition to student projects, more assessment tools in the area of issue and community in science are needed to increase trustworthiness.

Of the five students who graduated in May 2017, four have already passed the science teaching licensure test. We will keep track of our graduates if they pass the licensure test. We will provide our students with workshops and study guides to increase the pass rate of the licensure tests. The current Science Education curriculum, which was developed in response to REFA (i.e., state licensure rules), requires that our majors meet or exceed the existing science majors' coursework on campus. This challenging curriculum has made our program more rigorous and has possibly contributed to a desirable pass rate for our majors' content test for their licensure. Conversely, because of this rigorous curriculum, continuing to recruit and retain majors has been the main challenge for our Science Education program.

Student Learning Summary Report Rubric :: Office of Assessment & Accreditation :: Indiana State University

Degree Program: B.S. Science Education Date: 01.21.18

	Level 0 – Undeveloped	Level 1 – Developing	Level 2 – Mature	Level 3 – Exemplary
1. Student Learning Outcomes	<input type="checkbox"/> No outcomes were identified. <input type="checkbox"/> No Curriculum Map was provided.	<input checked="" type="checkbox"/> Outcomes were identified. <input checked="" type="checkbox"/> Some of the outcomes are specific, measurable, student-centered, program-level outcomes. <input type="checkbox"/> A Curriculum Map was provided.	<input type="checkbox"/> Outcomes are specific, measurable, student-centered, program-level outcomes. <input checked="" type="checkbox"/> Outcomes at least indirectly support Foundational Studies Learning Outcomes or the Graduate Learning Goals. <input type="checkbox"/> The Curriculum Map identifies where/to what extent each outcome is	<input type="checkbox"/> Outcomes are important, specific, measurable, student-centered program-level outcomes that span multiple learning domains. <input type="checkbox"/> Outcomes directly integrate with Foundational Studies Learning Outcomes or the Graduate Learning Goals. <input checked="" type="checkbox"/> Outcomes reflect the most important results of program completion (as established by

			<p>addressed.</p> <p><input type="checkbox"/> At least one outcome was assessed in this cycle.</p>	<p>an accreditor or other professional organization).</p> <p><input type="checkbox"/> Learning outcomes are consistent across different modes of delivery (face-to-face and online.)</p> <p><input type="checkbox"/> Outcomes are regularly reviewed (and revised, if necessary) by the faculty and other stakeholders.</p> <p><input checked="" type="checkbox"/> The Curriculum Map identifies where/to what extent each outcome is addressed and offers evidence that students have sufficient opportunity to master the associated learning outcomes.</p> <p><input checked="" type="checkbox"/> Two or more outcomes were assessed in this cycle.</p>
<p>2. Measures & Performance Goals</p>	<p><input type="checkbox"/> No measures are provided.</p> <p><input type="checkbox"/> No goals for student performance are identified.</p>	<p><input type="checkbox"/> Measures are provided, but some are vague and/or do not clearly assess the associated outcomes.</p> <p><input type="checkbox"/> Measures are primarily indirect.</p> <p><input type="checkbox"/> Performance goals are identified, but they are unclear or inappropriate.</p> <p><input type="checkbox"/> Some performance goals are based on course and/or assignment grades, but there is no evidence that grades are</p>	<p><input checked="" type="checkbox"/> At least one direct measure was provided for each outcome.</p> <p><input type="checkbox"/> Some information is provided to suggest that measures are appropriate to the outcomes being assessed.</p> <p><input checked="" type="checkbox"/> Clear and appropriate standards for performance are identified.</p> <p><input type="checkbox"/> Some performance goals are based on course and/or assignment grades, and</p>	<p><input type="checkbox"/> Multiple measures were employed, and most are direct.</p> <p><input checked="" type="checkbox"/> Detailed information is provided to show that measures are appropriate to the outcomes being assessed.</p> <p><input checked="" type="checkbox"/> Measures assess some high impact practices (internships, capstone course projects, undergraduate research, etc.)</p> <p><input type="checkbox"/> If students are required to</p>

		calibrated to the outcomes.	<p>general information is provided to demonstrate that grades are calibrated to the outcomes.</p> <p><input type="checkbox"/> Mechanisms used to assess student performance (rubrics, checklists, exam keys, etc.) were provided.</p>	<p>pass a certification or licensure exam to practice in the field, this was included as a measure.</p> <p><input checked="" type="checkbox"/> Some measures allow performance to be gauged over time, not just in a single course.</p> <p><input type="checkbox"/> If a measure is used to assess more than one outcome, a clear explanation is offered to substantiate that this is appropriate.</p> <p><input type="checkbox"/> Clear and appropriate standards for performance are identified and justified.</p> <p><input type="checkbox"/> Mechanisms used to assess student performance (rubrics, checklists, exam keys, etc.) were summarized as well as provided to demonstrate that the measure provides specific evidence of what students know/can do.</p> <p><input type="checkbox"/> If performance goals are based on course and/or assignment grades, specific evidence is provided to demonstrate that grades are calibrated to the outcomes.</p>
3. Results	<p><input type="checkbox"/> No data are being collected.</p> <p><input type="checkbox"/> No information is provided about the data</p>	<p><input type="checkbox"/> Some data are being collected and analyzed.</p> <p><input type="checkbox"/> Some results are provided.</p>	<p><input type="checkbox"/> Data are being collected and analyzed.</p> <p><input type="checkbox"/> Results are provided.</p>	<p><input checked="" type="checkbox"/> Clear, specific, and complete details about data collection, analysis, and interpretation of results are provided to demonstrate the</p>

	<p>collection process.</p> <p><input type="checkbox"/> No results are provided.</p> <p><input type="checkbox"/> Students are meeting few of the performance standards set for them.</p>	<p><input type="checkbox"/> Insufficient information is offered to demonstrate that data collection, analysis, and interpretation processes are valid.</p> <p><input type="checkbox"/> Students are achieving some of the performance standards expected of them.</p>	<p><input type="checkbox"/> Some information is offered to demonstrate that data collection, analysis, and interpretation processes are valid and meaningful.</p> <p><input checked="" type="checkbox"/> Students generally are achieving the performance standards expected of them.</p>	<p>validity and usefulness of the assessment process.</p> <p><input type="checkbox"/> Students generally are achieving the performance standards expected of them and demonstrate continuous improvement on standards they have yet to achieve/achieve less well.</p> <p><input checked="" type="checkbox"/> If students are required to pass a certification or licensure exam to practice in the field, the pass rate meets the established benchmark.</p>
<p>4. Engagement & Improvement</p>	<p><input type="checkbox"/> No one is assigned responsibility for assessing individual measures.</p> <p><input type="checkbox"/> Assessment primarily is the responsibility of the program chair.</p> <p><input type="checkbox"/> No improvements (planned or actual) are identified.</p> <p><input type="checkbox"/> No reflection is offered about previous results or plans.</p>	<p><input type="checkbox"/> The same faculty member is responsible for collecting and analyzing most/all assessment results.</p> <p><input checked="" type="checkbox"/> It is not clear that results are shared with the faculty as a whole on a regular basis.</p> <p><input type="checkbox"/> Plans for improvement are provided, but they are not specific and/or do not clearly connect to the results.</p> <p><input type="checkbox"/> Little reflection is offered about previous results or plans.</p>	<p><input type="checkbox"/> Multiple faculty members are engaged in collecting and analyzing results.</p> <p><input type="checkbox"/> Results regularly are shared with the faculty.</p> <p><input checked="" type="checkbox"/> The faculty regularly engages in meaningful discussions about the results of assessment.</p> <p><input checked="" type="checkbox"/> These discussions lead to the development of specific, relevant plans for improvement.</p> <p><input type="checkbox"/> Improvements in student learning have occurred as the result of assessment.</p>	<p><input checked="" type="checkbox"/> All program faculty members are engaged in collecting and analyzing results. But this is just one person.</p> <p><input type="checkbox"/> Faculty regularly and specifically reflect on students' recent achievement of performance goals and implement plans to adjust activities, expectations, outcomes, etc. according to established timelines.</p> <p><input type="checkbox"/> Faculty and other important stakeholders reflect on the history and impact of previous plans, actions, and results, and participate in the development of recommendations for improvement.</p>

				<input type="checkbox"/> Continuous improvement in student learning occurs as the result of assessment. <input type="checkbox"/> Outcomes and results are easily accessible to stakeholders on/from the program website. <input checked="" type="checkbox"/> Assessment is integrated with teaching and learning.
Overall Rating	<input type="checkbox"/> Level 0 – Undeveloped	<input type="checkbox"/> Level 1 - Developing	<input checked="" type="checkbox"/> Level 2 – Mature	<input type="checkbox"/> Level 3 – Exemplary

The program’s coordinator assessed nine learning outcomes this past year. At least one of them (#2.3) is a clear, measurable, student learning outcome; the others employ verbs that cannot be assessed (e.g., understand) or are program goals (e.g., #1.1). Yet the assessment measures appear to align with the outcomes, and they include high-impact practices such as the teaching portfolio and student teaching. Standards not only are appropriate but also are geared to rubrics that provide specific evidence of what students know and can do well and less well. Students met the standards set for all outcomes. Four of these five students also had passed the science teaching licensure test.

Results were assessed and analyzed by the program coordinator, who also developed plans to improve student performance that include offering workshops and study guides to improve test scores, and identified a need to provide additional assessment of issues and community in science.

Thank you for submitting your Student Learning Summary Report!