EASTERN ILLINOIS UNIVERSITY

Student Learning Outcomes (SLOs) Report for Accredited Programs

(*updated 9/19/23*)

Program Type: **Accredited Program**

Program Name: B.S w/ Teacher Licensure Science

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Submission Date:

Review Cycle:

- Even Year
- **Odd Year**

Review Round and Instructions

- **Round A** (Associate Dean review)**:** Submit this cover sheet and a copy of the annual (or periodic) report most recently submitted to the accrediting agency; your accreditation report should address assessment.

- **Round B** (Associate Dean + VPAA review): Submit this cover sheet and the following:
  - evidence of ongoing accreditation (document confirming accreditation status, which could be a letter from the accrediting agency)
  - annual (or periodic) accreditation report submitted to agency
  - this SLO report, which provides a summary of the program's collection and evaluation of its annual assessment data*
  - an optional cover memo (not to exceed one page), which briefly describes any information or highlights the department believes would be important to demonstrate academic excellence and program quality

If your program completed a significant review (accreditation application and/or the full 8-year IBHE report) in the last calendar year, then you may, with permission from the VPAA or designee, substitute either of these major reports for your typical Student Learning Outcomes report, in "Round B." **To be approved, these documents must substantively discuss assessment, outcomes, and data, and have been prepared and submitted within the same calendar year.*

All SLO reports are archived here: https://www.eiu.edu/assess/majorassessment.php
DUE: **October 15th** to your Associate Dean or designee

Each academic program is expected to prepare a Summary of the Assessment Data by Student Learning Outcome. This summary may take the form of a chart or other means of presentation that describes the annual data collected, when it is collected, in which course(s), through which assignment or activity, and by whom. This summary should clearly indicate what the program seeks to discover in its students' learning. The summary should correspond to the record-keeping documents maintained by the academic program.

Program Name:

PART 1. OVERVIEW OF STUDENT LEARNING OUTCOMES AND MEASURES

Student Learning Outcome (SLO)	What **measures and instruments** are you using? This could be an oral or written exam, a regularly assigned paper, a portfolio—administered early and later in coursework.	How are you using this info to improve student learning? What are you hoping to learn from your data? Include **target score(s) and results**, and specify whether these were met, not met, or partially met for each instrument.	Does your SLO correspond to an **undergraduate learning goal (ULG)**: writing, speaking, quantitative reasoning, critical thinking, responsible citizenship?
1. Preservice science teachers will a) use and apply the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields, b) demonstrate knowledge of crosscutting concepts, disciplinary core ideas, practices of science and engineering, the supporting role of science-specific	a) State Content Exam for Certification b) GPA from science content courses c) Unit Plan from BIO/PHS 3400	a) Passing score on the State Content Exam is a score of 240 overall Science content tests taken between fall 2021-fall 2023 = 11 (average score 246) 6 passing scores averaging 261, range from 242-278 5 failing scores ranging from 208-238. These 5 scores include 4 from 2 students who retook the test until they passed. Most students pass on the first try, some have to retake it, but eventually succeed. **Goal is partially met.**	CT W S Q

technologies, and contributions of diverse populations to science, and c) demonstrate knowledge of how to implement science standards, learning progressions, and sequencing of science content for teaching their licensure level secondary students.		b) Students must maintain a 2.65 GPA according to IBHE 26 students have been enrolled in the Science Teacher Licensure program between Fall 2021 and Fall 2023. In that time 3 are currently enrolled who have GPAs that need to be raised. Three have switched majors in that time. One did not have a high enough GPA at the time when she switched majors. Overall students are **meeting** the GPA requirement. c) Students will earn a score of at least 112.5/150 on the Unit Plan, with particular focus on #3,5,8,9,10, and 26 on the rubric. Fall 2021: 1 student, 121/150 Fall 2022: 5 students, 4 students earned at least 112.5/150. One student did not meet this goal. 5/6 students met goals 3, 8, 9, 10 (83%) 6/6 students met goals 5 and 26 (100%) **Goal Is met.**	

2. Preservice science teachers will design lessons a) using science standards and a variety of appropriate student-centered, and culturally relevant science disciplinary-based instructional approaches that follow safety procedures and incorporate science and engineering practices, disciplinary core ideas, and cross cutting concepts, b) incorporating appropriate differentiation strategies, wherein ALL students develop conceptual knowledge and an understanding of the nature of science. Lessons should engage students in applying science practices, clarifying relationships, and identifying natural patterns from empirical experiences, c) using engineering practices in support of science learning wherein all students design, construct, test, and optimize possible solutions to a problem, d) aligning instruction and assessment strategies to support instructional decision	Unit Plan and learning inquiry learning segment that accompanies the assignment from BIO/PHS 3400	a) Students will earn a score of at least 112.5/150 on the Unit Plan. Fall 2021: 1 student, 121/150 Fall 2022: 5 students, 4 students earned at least 112.5/150. One student did not meet this goal (47/150). 5/6 students (83%) met the goal of earning at least 112.5/150. This is acceptable. b) 35/50 points on the accompanying lessons. Fall 2021: 1 student, 41.5/50 Fall 2022: 5 students, all 5 students met this goal. Scores ranged from 35-48/50. **This goal is met.** c)Students will earn scores of at least 3 on the Unit Plan rubric for #6,17,19,21,23,25,26. Goals 23 and 26 were met by 6/6 students (100%) Goals 6,17, and 25 were met by 5/6 students (83%) Goals 19, and 21 were met by 4/6 students (67%) **This goal is met.**	CT Q R W

making that identifies and addresses student misunderstandings, prior knowledge, and naïve conceptions, and e) integrating science-specific technologies to support ALL students' conceptual understanding of science and engineering.			
3. Preservice science teachers will a) plan a variety of lesson plans based on science standards that employ strategies that demonstrate their knowledge and understanding of how to select appropriate teaching and motivating learning activities that foster an inclusive, equitable, and anti-bias environment, b) plan learning experiences for ALL students in a variety of environments (e.g. the laboratory, field, and community)within their fields of licensure, and c) plan lessons in which all students have a variety of opportunities to investigate, collaborate, communicate, evaluate, learn from mistakes, and defend their own explanations of scientific phenomena, observations, and data.	Unit Plan from BIO/PHS 3400 and inquiry learning segment that accompanies the assignment form BIO/PHS 3400	a)Students will earn a score of at least 112.5/150 on the Unit Plan Fall 2021: 1 student, 121/150 Fall 2022: 5 students, 4 students earned at least 112.5/150. One student did not meet this goal 5/6 students (83%) met the goal of earning at least 112.5/150. **Goal is met.** b) 35/50 points on the accompanying lessons Fall 2021: 1 student, 41.5/50 Fall 2022: 5 students, all 5 students met this goal. Scores ranged from 35-48/50. **This goal is met.** c)Students will earn scores of at least 3 on the Unit Plan rubric for # 2,3,4,5,6,7,8,9,10,12,13,15,16,22,24,25,26	R CT W

		Goals 24 and 26 were met by 6/6 students (100%). Goals 2,3,4,5,6,7,8,9,10,12,13,15,16,22, 25 were met by 5/6 students (83%). **The goal is met.**	
4. Preservice teachers will a) implement activities appropriate for the abilities of ALL students that demonstrate safe techniques for the procurement, preparation, use, storage, dispensing, supervision, and disposal of all chemicals/materials/equipment used within their fields of licensure, b) demonstrate an ability to recognize hazardous situations including overcrowding; implement emergency procedures; maintain safety equipment; provide adequate student instruction and supervision; and follow policies and procedures that comply with established state and national guidelines, appropriate legal state and national safety standards (E.G. OSHA, NFPA, EPA) and best professional practices (e.g., NSTA, NSELA), and c) demonstrate ethical decision-making with respect to safe and humane treatment of	a)Student Teaching Safety Addendum b)Safety Module in BIO/PHS 3400 c)Safety Exam in BIO/PHS 3400	a) Student Teaching Safety Addendum- All students returned them and teachers received at least meets in all categories 8 students between Fall 2021-Spring 2023 **All were rated as either Professional or Meets Expectations in all categories.** **Goal Met** b) Students score at least a C on the safety module assignment in BIO/PHS 3400. 6 students all scored at least a C on the assignment. Grades ranged from 88-100, average was 96%. **This goal is met.** c) Students score at least a C on the safety exam in BIO/PHS 3400. All students scores better than a C on the safety exam. **This goal is met.**	N/A

all living organisms in and out of the classroom, and comply with the legal restrictions and best professional practices on the collection, care, and use of living organisms as relevant to their fields of licensure.			
5. Preservice teachers will a)implement assessments that show ALL students have learned and can apply disciplinary knowledge, nature of science, science and engineering practices, and crosscutting concepts in practical, authentic, and real-world situations, b) collect, organize, analyze, and reflect on formative and summative evidence and use those data to inform future planning and teaching, c) analyze science-specific assessment data based upon student demographics, categorizing the levels of learner knowledge, and reflect on results for subsequent lesson plans.	a)edTPA assignment. AND/OR b)P-12 Science Impact assignment completed during student teaching (this rubric is used to assess edTPA assignments by the science teacher licensure coordinator).	a)Students pass the edTPA (score 39/75) The edTPA has not been used since Fall 2020. It was discontinued due to covid and then it has yet to be brought back as an assessment. b)Using the rubric for the P-12 assignment, students will achieve an "Acceptable" score with regard to each standard assessed. Standard 1- Content: 6/8 student teachers met the standard. Standard 2- Nature of Science: 5/8 met the standard. Standard 3- Inquiry: 5/8 met the standard. This goal is **partially met.**	CT Q W R
6. Preservice teachers will a) engage in critical reflection on their own science teaching to continually improve their	a) Professional Development Survey	a) Along with opportunities offered as a part of BIO/PHS 3400 (field trip to Douglas-Hart Nature Center, etc.), students will show that over the	R

instructional effectiveness, b) participate in professional development opportunities to deepen their science content knowledge and practices, and c) participate in professional development opportunities to expand their science-specific pedagogical knowledge.	b) Reflection paper after microteaching assignments in BIO/PHS 3400 c) P-12 Science Impact Assignment AND/OR edTPA	course of their time at EIU, they have attended at least 1 discipline-specific (science) talk or event and 1 education-focused event. All students (8) completing the program between Fall 2021-Spring 2023 have done at least 1 professional development event focusing on their science discipline and 1 focusing on pedagogy/education. **This goal is met.** b) Students complete reflection paper after both microteaching assignments in BIO/PHS 3400 All students in BIO/PHS 3400 successfully completed reflection papers after both microteaching assignments. **This goal is met.** c) Reflection on teaching is evident in the edTPA and/or P-12 Impact assignment submitted during student teaching. Reflection on teaching is evident in 7/8 of the the P-12 impact assignments. This goal is **met**.	

PART 2. IMPROVEMENTS AND CHANGES BASED ON ASSESSMENT

A. Provide a short summary (1-2 paragraphs) or bulleted list of any **curricular actions** (revisions or additions) that were approved over the past two years as a result of reflecting on the student learning outcomes data. Are there any additional future changes, revisions, or interventions proposed or still pending?

- The safety module is a better way of assessing how teacher candidates understand and will implement safety units in their classrooms, as compared with the safety exam. The safety exam is being phased out.
- The P-12 impact science assignment has been brought back into use after using the edTPA has been discontinued in recent years.
- The P-12 Impact Science Assignment needs to be revised to improve it. It also needs to be introduced and explained more extensively in the departmental methods course (BIO/PHS 3400).

B. Provide a brief description or bulleted list of **any improvements (or declines)** observed/measured in student learning. Be sure to mention any intervention made that has not yet resulted in student improvement (if applicable).

- The P-12 Impact Science Assignment which is due while student teaching has proven challenging. edTPA was explained much more extensively both in science methods and in practicum, so students had a better idea of what the assignment entails. I think the description in the handout given to the students needs to be improved and perhaps to provide them with a good example. Not all students are comparing data that is comparable. Not all students are actually using units that align with the standard that is being assessed. It is also difficult to get students to put a lot of effort into it, since it is not for a grade. They must do it for program assessment and for data for the SPA report.
- Content Tests are required for licensure. Currently, they are not required until after student teaching. Most students pass on the first try. Some students struggle. The Content Test was taken 11 times over the last 2 years. 6 were passing scores. 5 were failing scores. Those failing scores included 4 tests from 2 students who eventually did pass the content test.
- GPA requirement: Students in Teacher Education programs must have a GPA of at least 2.65. Most are able to achieve this. A few are not. Those students either bring up that GPA or switch to other majors. Currently, there are 3 students who have GPAs below the 2.65 cutoff.
- Unit Plan: 5/6 students met the goal of at least a C on the Unit Plan. However, 1 student. There will always be a student or two who does not plan ahead and does poorly on the unit plan. Overall, they do well on the Unit Plan.
- Goals 19 and 21 on the Unit Plan. Students are not meeting these as often as I would hope. Only 4/6 met this goal on the Unit Plan. 19 is Analysis of Problems and 21 is Use of Technology. These need to be better explained in BIO/PHS 3400 so students have a better idea of how to meet them.

C. HISTORY OF DATA REVIEW OVER THE PAST TWO YEARS

Please document annual faculty and committee engagement with the assessment process (such as the review of outcomes data, revisions/updates to assessment plan, and reaffirmation of SLOs).

Date of annual (or periodic) review	**Individuals or groups who reviewed the assessment plan**	**Results of the review (i.e., reference proposed changes from any revised SLOs or from point 2.A. curricular actions)**
November 2023 (we have not yet met)	**Department chairs and advisers for Science Teacher Licensure and the Teacher Licensure Coordinator (Jim Davis, Tom Canam, Ed Treadwell, Steve Daniels, Katie Lewandowski, Ruth Chesnut, Don Pakey)**	**This will be done for the next report.**

CLAS Dean's Comments

The BS in Science Teacher Licensure program is accredited by the NSTA and the program continues in good standing and meets all the SPA standards. SLOs are linked to SPA assessment requirements and the data indicate that program learning goals are either fully or partially met. It's worth emphasizing that data based on edTPA has not been available since fall 2020 when it was discontinued due to COVID. The Science Impact assignment that has replaced edTPA to measure student application of disciplinary knowledge has led to challenges in assessing student mastery of that learning goal. The report clearly identifies where student outcomes can be improved and also notes areas where students have demonstrated success (for example, students have done well on the Unit Plan). A review of the assessment plan involving coordinators and department chairs is planned for inclusion in the next report. Overall, the program report is well done and we look forward to seeing the progress at the 4-year mark (2025).

Dean or designee: Michael Cornebise  Date: 11/17/2023

VPAA Office Review and Feedback (for "Round B" SLO report only)

B.S. Science with Teacher Licensure (accredited)

The B.S. in Science with Teacher Licensure program forwards a number of key observations and areas for improvement for science teacher preparation. As noted above, all relevant coordinators and department chairs will review the assessment plan. This means that several voices will need to participate in the improvement of student learning across multiple science disciplines—from capturing student interest in becoming science teachers, to providing examples of successful P-12 Impact Science Assignments (if that is the instrument the program decides to update), to prepping students all along the way for teaching and for passing the content test.

VPAA or designee **Dr. Suzie Park, Asst VPAA Interim** Date **4/2/24**

Student Teaching Assignment:
Impact on Student Learning of Science

This assignment is designed to help you measure your impact on your students' learning during your student teaching. "Student learning" is a demonstrable change in student understanding of content, reasoning, and/or process skills. You have flexibility in how you assess student learning. Quizzes/tests, lab reports, writing assignments, projects, problem solving, discussions, and many other forms of assessment are acceptable as long as they provide the required information.

You will need to go beyond creating a list of students' scores on tests and assignments; rather, you will assess their *gains* in understanding. One way to do this would be to give tests before and after teaching a unit and compare the scores on the two tests. You may also design alternative assessments that accomplish the same thing.

You will need to assess your students' learning in ways that allow you to see their gains in understanding ***beyond memorization***. Include ways to engage students in higher-order cognitive processes such as judging, problem solving, and applying their understanding to new situations. So that I know that the students have made gains beyond memorization and to insure that you are comparing data that is comparable, I ask that you include any assignments/test questions along with a key, please.

This assignment will be assessed with the attached rubric. In order to earn recommendation for licensure, you will need to achieve at least an "Acceptable" rating for each standard. Remember that in order to earn a score of Target, you must have your students reflect on their learning process (not just whether they enjoyed the activity or not!).

Turn in your completed assignment as soon as it is completed via e-mail. You will need to turn it in before you can receive a grade for student teaching. In order to allow time for me to take a look at the submitted assignments and allow for you to resubmit, if there is a problem, please turn in the assignment by December 13, 2023. Please direct any questions you have about the assignment to Dr. Katie Lewandowski at kjlewandowski@eiu.edu.

STANDARD 1: SCIENCE CONTENT/Disciplinary Core Ideas and Cross Cutting Concepts

1. **What you taught**
   Choose a unit that you taught to students. List the scientific concepts, principles, theories, laws, and interrelationships that you covered in the unit and the activities you used to teach each of them. Please relate them to the Disciplinary Core Ideas and Cross Cutting Concepts in the NGSS.

2. **Your assessments**
   How did you assess your students' gain in knowledge of science content (pre- and post-tests, lab reports, other assignments, discussions, etc.)? How did you assess whether the gain in knowledge went beyond memorization? Provide a brief description of the assessment(s) you used.

3. **Your assessment standards**
   How did you determine whether students' responses were satisfactory? Provide a description of the criteria you used to make this determination. When alternative assessments were used, you must include clear, unambiguous standards for scoring the assessments. For example, if you used a rubric, please attach it.

4. **Results**

   Collect and organize the data: Provide data that show the extent of the students' gain in understanding, including gains beyond memorization. (Measure the students' level of understanding before and after instruction.) Graphs, charts, and/or tables should be used to organize the data. Raw data such as individual test scores are not necessary; provide aggregated data such as mean and median scores. Standard deviations would be helpful. ***Make sure you are comparing data that is comparable!***

   Analyze and interpret the data: What do the data tell you about the effectiveness of your teaching? Analyze science-specific assessment data based upon student demographics, categorizing the levels of learner knowledge, and reflect on results for subsequent lesson plans.

STANDARD 2: NATURE OF SCIENCE

1. **What you taught**

   The nature of science includes: (a) the historical and cultural development of science, and (b) the philosophical tenets, assumptions, goals, and values of science, i.e., how science goes about discovering knowledge and how science differs from other ways of exploring/understanding reality. Describe how you taught the nature of science, listing the activities you used to teach it, during one unit of instruction. It's probably easiest to think about the Nature of Science as way in which we do science, like science process skills, etc.

2. **Your assessments**

   How did you assess your students' gain in knowledge of the nature of science (pre- and post-tests, lab reports, other assignments, discussions, etc.)? How did you assess whether the gain in knowledge went beyond memorization? Provide a brief description of the assessment(s) you used.

3. **Your assessment standards**

   How did you determine whether students' responses were satisfactory? Provide a description of the criteria you used to make this determination. When alternative assessments were used, you must include clear, unambiguous standards for scoring the assessments. For example, if you used a rubric, please attach it.

4. **Results**

   Collect and organize the data: Provide data that show the extent of the students' gain in understanding, including gains beyond memorization. (Measure the students' level of understanding before and after instruction.) Graphs, charts, and/or tables should be used to organize the data. Raw data such as individual test scores are not necessary; provide aggregated data such as mean and median scores. Standard deviations would be helpful. ***Make sure you are comparing data that is comparable!***

   Analyze and interpret the data: What do the data tell you about the effectiveness of your teaching? Analyze science-specific assessment data based upon student demographics, categorizing the levels of learner knowledge, and reflect on results for subsequent lesson plans.

STANDARD 3: INQUIRY/ Science and Engineering Practices

1. **What you taught**
   Choose a unit that you taught to students. List the all the ways in which you engaged your students in scientific inquiry and investigation during the unit. Include all examples of how you engaged students in observations, asking questions, designing experiments, data collection and interpretation, and inferences in a scientific manner.

2. **Your assessments**
   How did you assess your students' gain in knowledge of science inquiry (pre- and post-tests, lab reports, other assignments, discussions, etc.)? How did you assess whether the gain in knowledge went beyond memorization? Provide a brief description of the assessment(s) you used.

3. **Your assessment standards**
   How did you determine whether students' responses were satisfactory? Provide a description of the criteria you used to make this determination. When alternative assessments were used, you must include clear, unambiguous standards for scoring the assessments. For example, if you used a rubric, please attach it.

4. **Results**
   Collect and organize the data: Provide data that show the extent of the students' gain in understanding, including gains beyond memorization. (Measure the students' level of understanding before and after instruction.) Graphs, charts, and/or tables should be used to organize the data. Raw data such as individual test scores are not necessary; provide aggregated data such as mean and median scores. Standard deviations would be helpful. **Make sure you are comparing data that is comparable!**

   Analyze and interpret the data: What do the data tell you about the effectiveness of your teaching? Analyze science-specific assessment data based upon student demographics, categorizing the levels of learner knowledge, and reflect on results for subsequent lesson plans.

Standard 4: PROFESSIONAL DEVELOPMENT

What have you done to broaden your perspectives over the course of your undergraduate tenure? Have attended Science events around campus or Zoom events, this could include Darwin Day Lectures, or other talks around EIU or beyond? These should be things outside of your classes. In addition, what have you done regarding professional development for your career in education? Have you attended any events in Buzzard that the College of Education has hosted? Did you attend any Zoom events or webinars about pedagogy or education?

This is the NSTA standard I am trying to address:
Participate in professional development opportunities to deepen their science content knowledge and practices. Participate in professional development opportunities to expand their science-specific pedagogical knowledge.

Assessment of Candidate's Impact on Student Learning of Science

Standard	Unacceptable	Acceptable	Target
1. The candidate is able to successfully convey to students the major science concepts, principles, theories, laws, and interrelationships of their fields of licensure.	The data show that K-12 students' have not positively changed their understanding of major science concepts, principles, theories, laws, and interrelationships as a result of instruction by the candidate. Student knowledge of science does not go beyond memorization. Candidate did not collect, organize, and analyze data in a manner that could be interpreted.	The data show that K-12 students' understandings of major science concepts, principles, theories, laws, and interrelationships have positively changed as a result of instruction by the candidate. Content learning was reflected in a level of understanding beyond memorization. Candidate collected, organized, and analyzed data in a manner that could be interpreted.	The data show that K-12 students' understandings of major science concepts, principles, theories, laws, and interrelationships have positively changed as a result of instruction by the candidate. The candidate has analyzed science-specific assessment data based upon student demographics, categorizing the levels of learner knowledge, and reflected on results for subsequent lesson plans. Content learning was reflected in a level of understanding beyond memorization. Candidate collected, organized, analyzed and interpreted data.
2. The candidate is able to successfully engage students in studies of the history, philosophy, and practice of science, to distinguish science from non-science, and critically analyze assertions made in the name of science.	The data show that K-12 students' have not positively changed their understanding of the nature of science as a result of instruction by the candidate. Student knowledge of science does not go beyond memorization. Candidate did not collect, organize, and analyze data in a manner that could be interpreted.	The data show that K-12 students' understandings of the nature of science have positively changed as a result of instruction by the candidate. Content learning was reflected in a level of understanding beyond memorization. Candidate collected, organized, and analyzed data in a manner that could be interpreted.	The data show that K-12 students' understandings of the nature of science have positively changed as a result of instruction by the candidate. The candidate has analyzed science-specific assessment data based upon student demographics, categorizing the levels of learner knowledge, and reflected on results for subsequent lesson plans. Content learning was reflected in a level of understanding beyond memorization. Candidate collected, organized, analyzed and interpreted data.
3. The candidate engages students effectively in scientific inquiry and investigations.	Provides minimal to no evidence that students develop concepts and relationships from their observations, data, and inferences as a result of inquiry-based instruction by the candidate. Student knowledge of science does not go beyond memorization. Candidate did not collect, organize, and analyze data in a manner that could be interpreted.	Provides evidence that shows students observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences as a result of inquiry-based instruction by the candidate. Content learning was reflected in a level of understanding beyond memorization. Candidate collected, organized, and analyzed data in a manner that could be interpreted.	Provides multiple authentic and creative examples that demonstrate students observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences as a result of inquiry-based instruction by the candidate. The candidate has analyzed science-specific assessment data based upon student demographics, categorizing the levels of learner knowledge, and reflected on results for subsequent lesson plans. Content learning was reflected in a level of understanding beyond memorization. Candidate collected, organized, analyzed and interpreted data.
4. Professional Development	The candidate failed to participate in any professional development.	.The candidate participated in at least 1 professional development opportunity focused on	The candidate participated in multiple opportunities for professional development in both science-specific areas

Standard	Unacceptable	Acceptable	Target
		science and one focused on education and pedagogy.	and in the field of education and pedagogy.

UNIT PLAN ASSESSMENT
BIO/PHS 3400 Methods of Teaching Science

Requirement	Exceeds Requirement (5 points)	Meets Requirement (2-4 points)	Does Not Meet Requirement (0-1 point)
1. Unit length and scope	The unit encompasses at least three weeks of instruction. The scope is particularly well thought out.	The unit encompasses at least three weeks of instruction. The scope is appropriate.	The unit encompasses fewer than three weeks of instruction and/or the scope is too narrow or too broad.
2. Unit Objectives	Objectives for the unit are very clear and appropriate. They include key knowledge and skills and are particularly well thought out.	Objectives for the unit are clear and appropriate. They include key knowledge and skills.	Objectives for the unit are unclear or missing.
3. Unit content	There is a very clear and direct relationship between the objectives and the content of the unit.	There is a direct relationship between the objectives and the content of the unit.	The relationship between some or all of the objectives and the content of the unit is unclear.
4. Human development	The intended grade level is stated, and all lessons demonstrate an in-depth understanding of the cognitive, social, emotional, ethical and physical domains at the appropriate level of development.	The intended grade level is stated, and the lessons demonstrate an understanding of the cognitive, social, emotional, ethical and physical domains at the appropriate level of development.	The intended grade level is not stated and/or one or more lessons demonstrate a lack of understanding of the cognitive, social, emotional, ethical and physical domains at the appropriate level of development.
5. Curricular sequence	The sequence of curricular content is particularly well thought out and very logical.	The sequence of curricular content is logical.	The sequence of curricular content is unclear or illogical.
6. Instructional methods NSTA 3a	Unit includes a variety of instructional methods that demonstrate an excellent knowledge and understanding of how to select appropriate teaching and learning activities, which are inclusive and motivating for all students.	Unit includes a variety of instructional methods that demonstrate a knowledge and understanding of how to select appropriate teaching and learning activities, which are inclusive and motivating for all students.	Unit does not include a variety of different types of instructional methods, includes inappropriate methods, and/or fails to be inclusive and motivating for all students.

Requirement	Exceeds Requirement	Meets Requirement	Does Not Meet Requirement
7. Assessment NSTA 3c	Unit includes excellent use of fair and equitable assessment strategies to analyze student learning and to evaluate if the learning goals are met. Assessment strategies are designed to continuously evaluate preconceptions and ideas that students hold and the understanding that students have formulated.	Unit includes use of fair and equitable assessment strategies to analyze student learning and to evaluate if the learning goals are met. Assessment strategies are designed to evaluate preconceptions and ideas that students hold and the understanding that students have formulated.	Unit does not include use of fair and equitable assessment strategies to analyze student learning and to evaluate if the learning goals are met. Assessment strategies are not designed to evaluate preconceptions and ideas that students hold and the understanding that students have formulated.
8. Scientific concepts and principles NSTA 1a	Lessons very successfully and accurately convey to students concepts and principles of science. Creative planning is evident.	Lessons successfully and accurately convey to students concepts and principles of science.	One or more lessons contain scientific inaccuracies and/or are ineffective at conveying concepts or principles.
9. Scientific theories NSTA 1a	In particularly effective ways, the unit teaches how scientific theories are developed.	The unit teaches how scientific theories are developed.	The unit fails to teach how scientific theories are developed.
10. Scientific laws NSTA 1a	The unit teaches the nature of scientific laws and relates concepts to them in particularly effective ways.	The unit teaches the nature of scientific laws and relates concepts to them.	The unit fails to teach the nature of scientific laws or to relate concepts to them.
11. Science interrelationships NSTA 1a	The unit makes relationships in and between sciences clear in more than three lessons.	The unit makes relationships in and between sciences clear in three lessons.	The unit makes relationships in and between science clear in fewer than three lessons.
12.Inquiry NSTA 2a	Unit includes many (5+) inquiry lessons and/or include more than three types of inquiry. Demonstrates excellent knowledge of how all students learn science.	Unit has 5 lessons that include inquiry. At least three types of inquiry are represented. Demonstrates some knowledge of how all students learn science.	Unit has fewer than 5 lessons that include inquiry, and/or fewer than three types of inquiry are represented. Does not demonstrate knowledge of how all students learn science.

Requirement	Exceeds Requirement	Meets Requirement	Does Not Meet Requirement
13. Active Inquiry NSTA 2b, 3b	Unit includes multiple (3+) very well planned active inquiry lessons where students collect and interpret data in order to develop and communicate concepts and understand scientific processes, relationships and natural patterns from empirical experiences. Applications of science – specific technology are included in the lesson where appropriate. These lessons thoughtfully and creatively provide for equitable achievement of science literacy for all students.	Unit includes some (3) active inquiry lessons where students collect and interpret data in order to develop and communicate concepts and understand scientific processes, relationships and natural patterns from empirical experiences. Applications of science –specific technology are included in the lesson where appropriate. These lessons provide for equitable achievement of science literacy for all students.	Unit does not include active inquiry lessons where students collect and interpret data in order to develop and communicate concepts and understand scientific processes and relationships and natural patterns from empirical experiences, or the lessons are inappropriate. These lessons do not provide for equitable achievement of science literacy for all students.
14. History and Philosophy of science	Unit includes well planned and effective lessons that teach how science discovers new knowledge and/or the history of science.	Unit includes multiple lessons that teach how science discovers new knowledge and/or the history of science.	Unit does not include multiple lessons that teach how science discovers new knowledge and/or history of science, or lessons are ineffective.
15. Laboratory and Field Settings NSTA 3a	Unit includes more than three activities in a laboratory and/or field setting. Creative planning is evident.	Unit includes one activity in a laboratory or field setting.	Unit does not include an activity requiring laboratory or field setting, or the assignment is inappropriate.
16. Socially important issues	Unit includes more than three effective lessons about socially important issues in science or technology and teaches processes used to analyze issues.	Unit includes three effective lessons about socially important issues in science or technology and teaches processes used to analyze issues.	Unit includes fewer than three effective lessons about socially important issues in science or technology or processes used to analyze issues.

Requirement	Exceeds Requirement	Meets Requirement	Does Not Meet Requirement
17. Naïve concepts and preconceptions NSTA 2c	Unit incorporates both instructional and assessment strategies that confront and address naïve concepts and preconceptions effectively and creatively.	Unit incorporates both instructional and assessment strategies that confront and address naïve concepts and preconceptions.	Unit does not incorporate both instructional and assessment strategies that confront and address naïve concepts and preconceptions, or does not incorporate them effectively.
18. Community resources	Unit includes more than one lesson that uses community resources to promote the learning of science.	Unit includes one lesson that uses community resources to promote the learning of science.	Unit does not include a lesson that uses community resources to promote the learning of science, or the lesson is inappropriate.
19. Analysis of problems	Unit includes more than one lesson that engages students in analysis of a problem, including considerations of risks, costs, and benefits of alternative solutions, relating these to the knowledge, goals, and values of the students.	Unit includes one lesson that engages students in analysis of a problem, including considerations of risks, costs, and benefits of alternative solutions, relating these to the knowledge, goals, and values of the students.	Unit does not include a lesson that engages students in analysis of a problem, including considerations of risks, costs, and benefits of alternative solutions, relating these to the knowledge, goals, and values of the students, or the lesson is inappropriate.
20. Interdisciplinary	More than one lesson is interdisciplinary, i.e., the topic teaches material from two or more disciplines simultaneously.	One lesson is interdisciplinary, i.e., the topic teaches material from two or more disciplines simultaneously.	No interdisciplinary lessons are included, or the lesson is inappropriate.
21. Technology NSTA 3a, 3b	More than one lesson includes learning activities in which students use computers, and/or the activities are particularly effective.	One lesson includes learning activities in which students use science-specific technology to develop concepts, understand scientific processes, relationships and natural patterns from empirical experiences.	No lessons include learning activities in which students use computers, or the lesson is inappropriate.

Requirement	Exceeds Requirement	Meets Requirement	Does Not Meet Requirement
22. Higher level cognitive skills	More than 10 lessons require the students to use higher level cognitive skills.	Ten lessons require the students to use higher level cognitive skills.	Fewer than 10 lessons require the students to use higher level cognitive skills.
23. Safety NSTA 3d	Concern for the safety and welfare of students is particularly well thought out for all lessons.	All lessons demonstrate adequate concern for the safety and welfare of students.	One or more lessons demonstrate lack of concern for the safety and welfare of students.
24. Understanding and positive regard for students and their families	All lessons demonstrate a thorough understanding and positive regard for students and their families regardless of culture, religion, gender, sexual orientation, and varying abilities.	All lessons demonstrate understanding and a positive regard for students and their families regardless of culture, religion, gender, sexual orientation, and varying abilities.	One or more lessons fail to demonstrate understanding and a positive regard for students and their families.
25. Students' learning NSTA 3c	All lessons relate new material to students' prior knowledge and experiences. They demonstrate understanding of diverse learning needs in particularly effective ways.	All lessons relate new material to students' prior knowledge and experiences. They demonstrate understanding of diverse learning needs.	One or more lessons fail to relate new material to students' prior knowledge and experiences and/or they fail to demonstrate understanding of diverse learning needs.
26. State and National Curriculum Standards NSTA 1c	All lessons demonstrate an understanding of and are mapped to all relevant State and National Curriculum Standards for teaching of science.	All lessons demonstrate an understanding and are mapped to relevant State and National Curriculum Standards for teaching of science.	One or more lessons do not demonstrate an understanding and are not mapped to State or National Curriculum Standards.
27. Unit-at-a-glance table	A one-page table is included that summarizes each day of the unit in a particularly clear way.	A one-page table is included that summarizes each day of the unit.	The summary table is missing or unclear.

Requirement	Exceeds Requirement	Meets Requirement	Does Not Meet Requirement
28. Record-keeping system	A record-keeping system (e.g., an electronic grade book or spreadsheet file) is included, with all of the unit's assessments and their points possible. Sample students' data and grade calculations are included.	A record-keeping system (e.g., an electronic grade book or spreadsheet file) is included, with all of the unit's assessments and their points possible.	The record-keeping system is missing, incomplete, or unclear.
29. Citation of sources	All sources of ideas are properly and very clearly cited.	All sources of ideas are properly cited.	Citations of sources are missing or unclear.
30. Planning materials	All materials used in planning the unit are credible and relevant. A wide variety of types of sources is used.	All materials used in planning the unit are credible and relevant.	Some materials used in planning the unit lack credibility or relevance.
Total Points (out of 150) _____			

2012 NATIONAL RECOGNITION REPORT
Initial Preparation of Science Teachers (2012 Standards)

NCATE recognition of this program is dependent on the review of the program by representatives of the National Science Teachers Association.

COVER PAGE

Name of Institution

Eastern Illinois University

Date of Review

MM DD YYYY

08 / 01 / 2016

This report is in response to a(n):

- ○ Initial Review
- ○ Revised Report
- ◉ Response to Conditions Report

Program Covered by this Review

Science with Teacher Licensure-Specializations available in Biological Science, Chemistry, Physics, Earth Science

Grade Level(1)

9-12

(1) e.g. Early Childhood; Elementary K-6

Program Type (First Teaching License or Unspecified)

First Teaching License

Title for State License for which candidates are prepared, including science areas licensed to teach (2)

Science Education-Broadfield

(2) i.e., Single Field -Biology; Dual Field -– Biology and Chemistry; Broad Field, Integrated Science, etc.

Award or Degree Level

- ◉ Baccalaureate
- ○ Post Baccalaureate

- ○ Master's

PART A - RECOGNITION DECISION

SPA Decision on NCATE Recognition of the Program(s):

- ◉ Nationally recognized
- ○ Nationally recognized with conditions
- ○ Further development required **OR** Nationally recognized with probation **OR** Not nationally recognized [See Part G]

Test Results (from information supplied in Assessment #1, if applicable)

The program meets or exceeds an 80% pass rate on state licensure exams:

- ◉ Yes
- ○ No
- ○ Not applicable
- ○ Not able to determine

Comments, if necessary, concerning Test Results:

An 80% pass rate was established in previous report.

Summary of Strengths:

PART B - STATUS OF MEETING SPA STANDARDS

NSTA Standard 1

Effective teachers of science understand and articulate the knowledge and practices of contemporary science. They interrelate and interpret important concepts, ideas, and applications in their fields of licensure.

Preservice teachers will:

1a) Understand the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association.

1b) Understand the central concepts of the supporting disciplines and the supporting role of science-specific technology.

1c) Show an understanding of state and national curriculum standards and their impact on the content knowledge necessary for teaching P-12 students.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Previously Met

NSTA Standard 2

Effective teachers of science understand how students learn and develop scientific knowledge. Preservice teachers use scientific inquiry to develop this knowledge for all students.

Preservice teachers will:
2a) Plan multiple lessons using a variety of inquiry approaches that demonstrate their knowledge and understanding of how all students learn science.

2b) Include active inquiry lessons where students collect and interpret data in order to develop and communicate concepts and understand scientific processes, relationships and natural patterns from empirical experiences. Applications of science-specific technology are included in the lessons when appropriate.

2c) Design instruction and assessment strategies that confront and address naïve concepts/preconceptions.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Previously Met.

NSTA Standard 3
Effective teachers of science are able to plan for engaging all students in science learning by setting appropriate goals that are consistent with knowledge of how students learn science and are aligned with state and national standards. The plans reflect the nature and social context of science, inquiry, and appropriate safety considerations. Candidates design and select learning activities, instructional settings, and resources--including science-specific technology, to achieve those goals; and they plan fair and equitable assessment strategies to evaluate if the learning goals are met.

Preservice teachers will design a Unit of Study that:
3a) Use a variety of strategies that demonstrate the candidates' knowledge and understanding of how to select the appropriate teaching and learning activities – including laboratory or field settings and applicable instruments and/or technology- to allow access so that all students learn. These strategies are inclusive and motivating for all students.

3b) Develop lesson plans that include active inquiry lessons where students collect and interpret data using applicable science-specific technology in order to develop concepts, understand scientific processes, relationships and natural patterns from empirical experiences. These plans provide for equitable achievement of science literacy for all students.

3c) Plan fair and equitable assessment strategies to analyze student learning and to evaluate if the learning goals are met. Assessment strategies are designed to continuously evaluate preconceptions and ideas that students hold and the understandings that students have formulated.

3d) Plan a learning environment and learning experiences for all students that demonstrate chemical safety, safety procedures, and the ethical treatment of living organisms within their licensure area.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Previously Met.

Effective teachers of science can, in a P-12 classroom setting, demonstrate and maintain chemical safety, safety procedures, and the ethical treatment of living organisms needed in the P-12 science classroom appropriate to their area of licensure.

Preservice teachers will:
4a) Design activities in a P-12 classroom that demonstrate the safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used within their subject area science instruction.

4b) Design and demonstrate activities in a P-12 classroom that demonstrate an ability to implement emergency procedures and the maintenance of safety equipment, policies and procedures that comply with established state and/or national guidelines. Candidates ensure safe science activities appropriate for the abilities of all students.

4c) Design and demonstrate activities in a P-12 classroom that demonstrate ethical decision-making with respect to the treatment of all living organisms in and out of the classroom. They emphasize safe, humane, and ethical treatment of animals and comply with the legal restrictions on the collection, keeping, and use of living organisms.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Standard 4 is met. Assessments meet or exceed the preponderance of evidence required for this standard.

Assessment 4, Student Teaching Observation Form, provides evidence that candidates demonstrate proper chemical and materials safety (4a), use of safety procedures (4b), and ethical treatment of living organisms (4c) in P-12 classroom settings and in a manner appropriate for their area(s) of licensure.

NSTA Standard 5

Effective teachers of science provide evidence to show that P-12 students' understanding of major science concepts, principles, theories, and laws have changed as a result of instruction by the candidate and that student knowledge is at a level of understanding beyond memorization. Candidates provide evidence for the diversity of students they teach.

Preservice teachers will:
5a) Collect, organize, analyze, and reflect on diagnostic, formative and summative evidence of a change in mental functioning demonstrating that scientific knowledge is gained and/or corrected.

5b) Provide data to show that P-12 students are able to distinguish science from nonscience, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science.

5c) Engage students in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Previously Met.

NSTA Standard 6

Effective teachers of science strive continuously to improve their knowledge and understanding of the ever changing knowledge base of both content, and science pedagogy, including approaches for addressing inequities and inclusion for all students in science. They identify with and conduct themselves as part of the science education community.

Preservice teachers will:

6a) Engage in professional development opportunities in their content field such as talks, symposiums, research opportunities, or projects within their community.

6b) Engage in professional development opportunities such as conferences, research opportunities, or projects within their community.

Met	Met with Conditions	Not Met
◉	○	○

Comment:

Standard 6 is met. Assessments meet or exceed the preponderance of evidence required for this standard.

Assessment 6, Evidence of Professional Knowledge and Skills, provides evidence that candidates engage in professional development both within their content area (6a) and within science pedagogy (6b).

PART C - EVALUATION OF PROGRAM REPORT EVIDENCE

C.1. Candidates' knowledge of content

The program's use of Assessments 1 and 2 provide sufficient evidence that candidates understand the content in their subject area(s).

C.2. Candidates' ability to understand and apply pedagogical and professional content knowledge and skills

Data from Assessments 3 (Unit Plan), 4 (Student Teaching Observation Form), and 6 (Professional Knowledge and Skills) provide primary evidence of candidate professional and pedagogical knowledge and skills.

C.3. Candidate effects on P-12 student learning

Evidence was provided that the program's candidates are positively impacting P-12 student learning in all elements of Standard 5.

PART D - EVALUATION OF THE USE OF ASSESSMENT RESULTS

Evidence that assessment results are evaluated and applied to the improvement of candidate performance and strengthening of the program (as discussed in Section V of the program report)

PART E - AREAS FOR CONSIDERATION

Areas for consideration

None

PART F - ADDITIONAL COMMENTS

F.1. Comments on Section I (Context) and other topics not covered in Parts B-E:

None

F.2. Concerns for possible follow-up by the Board of Examiners:

None

PART G -DECISIONS

Please select final decision:

- **National Recognition**. The program is recognized through the semester and year of the institution's next NCATE accreditation decision in 5-7 years. **To retain recognition, another program report must be submitted mid-cycle (2 years in advance for a 5-year cycle and 3 years in advance for a 7-year cycle) before the next scheduled accreditation visit.** The program will be listed as nationally recognized through the semester of the next NCATE accreditation decision on websites and/or other publications of the SPA and NCATE. The institution may designate its program as nationally recognized by NCATE, through the semester of the next NCATE accreditation decision, in its published materials. National recognition is dependent upon NCATE accreditation. *Please note that once a program has been nationally recognized, it may not submit another report addressing any unmet standards or other concerns cited in the recognition report.*

Please click "Next"

This is the end of the report. Please click "Next" to proceed.