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

Name of Institution
Oklahoma State University

Date of Review
08/01/2018

This report is in response to a(n):
☐ Initial Review
☐ Revised Report
☒ Response to Conditions Report

Program Covered by this Review
Secondary Science Education

Grade Level
6-12

(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
010-Biological Sciences; 004-Chemistry; 008-Earth Science; 013-Physical Science; 014-Physics

(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 national 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 SPA benchmarked licensure test data requirement, if applicable:
- Yes
- No
- Not applicable
- Not able to determine

Comments, if necessary, concerning Test Results:
The program report provides clear, well-organized data, listing data for the five licenses for which students in the Secondary Science Education Program may choose. Data are disaggregated by licensure type and year., with sub-score data provided for all candidates taking each of five different content area exams. Three years data are provided for Biology and Chemistry, with scores indicating that all candidates passed each year. No Earth Science Assessment 1 data are available. Assessment 1 data are available for two physics and two physical science candidates, representing two implementations of the OSAT Exam for each licensure area; however, sub-score data are not provided. The Aggregate Candidate Data Table indicates that all candidates have passed the OSAT Test, with data available for three applications of Assessment 1 for Biology and Chemistry, two for Physics and Physical Science and one for Earth Science.

Summary of Strengths:
All secondary science teacher candidates are required to pass the state licensure test (OSAT, Oklahoma Subject Area Tests) prior to the student teaching. This is to ensure that all candidates have the subject-matter knowledge. The Science OSAT are aligned with the NSTA content standards for Science Teacher Preparation.

Program leaders are commended on the exemplary nature of this program report. It is quite evident that all elements of the six standards have been carefully applied to a rigorous and feasible assessment system.
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.

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Comment:
Assessment 1, state licensure exam, provides evidence that candidates understand the major concepts, principles, theories, laws, and interrelationships of their fields as recommended by the National Science Teachers Association and that more than 80% of the candidates have passed the exam in the past three years.

Assessment 2 (GPA) shows that the candidates achieved a score of 2.5 (out of 4) or above, indicating that they are above the expected level of mastery of the course requirements.

The program includes a Content Analysis Form (CAF) for Assessment 2 and it demonstrates 90% or greater alignment with 2012 NSTA Standards.

Assessment 3, Unit Plan, demonstrates that candidates understand state and national curriculum standards and their impact on the content knowledge necessary for teaching P-12 students.

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.

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Comment:
Assessment 3 (Unit Plan) provides evidence that candidates can plan multiple lessons that demonstrate their understanding of how students learn science. The lessons indicate that the candidates can engage students in inquiry using science-specific technology or 5E learning model where appropriate, and that
they confront and address students' naïve concepts/preconceptions about science.

Criteria using operational terms that can differentiate different levels of performance of candidates in observable ways are included.

**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.

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**Comment:**

Assessment 3 (Unit Plan) indicates that candidates produce a multi-week, research-based inquiry unit of instruction that incorporates the nature of science and the 5E learning model.

Criteria using operational terms that can differentiate different levels of performance of candidates in observable ways are included.

**NSTA Standard 4**

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.

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**Comment:**

Assessment 4 addresses many elements of many standards, but with regard to
Standard 4, only element 4a is assessed. Elements b and c of Standard 4 are not assessed in Assessment 4. Assessment 7 adequately addresses 4b and 4c.

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.

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Comment:
Assessment 5 (Impact on Student Learning) meet or exceed the preponderance of evidence required for this standard. It provides evidence that candidates demonstrate the impact of their instruction on P-12 students' scientific knowledge (5a), ability to understand aspects of the nature of scientific practices (5b), and use of scientific inquiries (5c).

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.

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Comment:
Assessment 6 (Attend a State/National Science Education Conference and Written Reflection) provides evidence that candidates engage in professional development both within content area (6a) and within science pedagogy (6b).
C.1. Candidates’ knowledge of content

Assessment 1 and 2 of the program provide sufficient evidence that it is preparing candidates to meet the content requirements of the NSTA standards for General Science.

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

Data from Assessment 3, 4, and 6 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.
### 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)

| Section V narrative provides clear indication that the program uses diverse sources of data as the basis for making changes in the program. |
### PART E - AREAS FOR CONSIDERATION

| Areas for consideration | NA |
| F.1. Comments on Section I (Context) and other topics not covered in Parts B-E: | NA |
| F.2. Concerns for possible follow-up by the CAEP site visitors: | NA |
Please select final decision:

- **National Recognition.** The program is recognized through the semester and year of the provider's next CAEP accreditation decision in 5-7 years. The Recognition Report will serve as program level evidence for the accreditation cycle it has been initiated. **To retain recognition and to gather new evidence for the next accreditation cycle, another program report must be submitted mid-cycle 3 years in advance of the next scheduled accreditation visit.** The program will be listed as Nationally Recognized through the semester of the next CAEP accreditation decision on websites and/or other publications of the SPA and CAEP. The institution may designate its program as Nationally Recognized by the SPA, through the semester of the next CAEP accreditation decision, in its published materials. **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.**
This is the end of the report. Please click "Next" to proceed.