

**NATIONAL RECOGNITION REPORT
INITIAL PREPARATION OF SCIENCE TEACHERS (2012)**

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

University of Puerto Rico at Cayey

Date of Review

MM DD YYYY

02 / 01 / 2015

This report is in response to a(n):

- Initial Review
- Revised Report
- Response to Conditions Report

Program Covered by this Review

Bachelor Degree in Arts in Secondary Education with a Major in General Science

Grade Level⁽¹⁾

7-12

(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⁾

Secondary Education Science Teacher

(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

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:

Assessment 1: The PCMAS should be aligned with the content competencies of the Content Analysis Form. It is difficult to determine the passing rate as stated of 83% for the specialty test in science. Data are disaggregated appropriately for year, sub-score, and average score. The range of scores, percent passing, and the number passing of the total at UPRC should be given.

It is very difficult to determine the criteria given the assessment provided in this report.

Summary of Strengths:

The success in the pedagogical area could be attributed to the fact that the program provides multiple opportunities for candidates to have direct contact with science teaching methodology and to analyze the pedagogical situations during their studies and the implementation of the new course (EDPE 4135) Secondary Science Teaching Methodology.

The REU and the Community Service project are also strengths of this program.

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:

Assessment 1: The PCMAS should be aligned with the content competencies of the Content Analysis Form. It is difficult to determine the passing rate as stated of 83% for the specialty test in science. Data are disaggregated appropriately for year, sub-score, and average score. The range of scores, percent passing, and the number passing of the total at UPRC should be given.

Students in UPRC have met the minimum standards for the exams given in Standard 1. The University does not use the typical Praxis II content exam that most other programs use to assess student content knowledge, but instead, use a state/island wide exam recognized by the government as an assessment of content competency. It is unclear why the unit uses so many other assessments to address this standard as stated in Section III-Relationship of Assessment to Standards.

Assessment 2: There is no Content Analysis Form to show alignment between the required science courses and the required science content. The data provided in the excel document for the required courses does not isolate the secondary science candidates. For example, the N for QUIM3131 is 32 for 2011. This does not represent only the secondary science education majors. This number is also different than the N for QUIM3123. If these are the required courses for all secondary science majors for the year 2011, the numbers should be the same or very close.

It is concerning that the data in Assessment 2 demonstrates a very low GPA for students taking the science content core courses. Averaging GPA's in science courses in the 1.0-2.0 range does not indicate competence in science content. It appears that only 64-69% of the candidates are passing the science content courses for the past 3 years.

The excel document with course grades does not match the courses required by the candidates found in the "Curriculo BA Educacion Secundaria Ciencias Naturales." Grades for only the required courses taken by all candidates should be reported.

Assessment 3: The Unit Plan and the Science Lesson Plan Rubric are generic and not science-specific. The criteria should include science-specific criteria using the languages of each individual NSTA element. There should only be one criterion aligned with one NSTA element. The alignment table aligns too many NSTA elements with the "parts of the lesson plan."

Data need to be presented in a disaggregated manner for each NSTA element.

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:

Assessment 3: The Unit Plan and the Science Lesson Plan Rubric are generic and not science-specific. The criteria should include science-specific criteria using the languages of each individual NSTA element. There should only be one criterion aligned with one NSTA element. The alignment table aligns too many NSTA elements with the "parts of the lesson plan."

The Unit Plan does not present evidence that teacher candidates are engaging their students in inquiry lessons. The lesson plans and unit plans do not demonstrate that inquiry is a focus of these assessments. The Unit requires teacher candidates to develop a 3 day unit, but each of the lessons are not specific to inquiry or nature of science. There is no evidence of addressing naive/preconceptions of content. Unless these items are directly assessed, the teacher candidates will not focus on them.

Data need to be presented in a disaggregated manner for each NSTA element.

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:

Assessment 3: The Unit Plan and the Science Lesson Plan Rubric are generic and not science-specific. The criteria should include science-specific criteria using the languages of each individual NSTA

element. There should only be one criterion aligned with one NSTA element. The alignment table aligns too many NSTA elements with the "parts of the lesson plan." Although there are criterion in the learning objectives, it is unclear what type of pedagogy has been demonstrated by the teacher candidate. In addition, through the admission of the Unit, it has been stated that inquiry in the classroom is problematic. It appears that lesson plans and unit plans do not promote inquiry instruction, 5E model or Learning cycle. The lesson plan rubric and unit plan rubric are void of the mention of inquiry or multiple pedagogical techniques observed. It is suggested that these are explicitly added to these documents.

Data need to be presented in a disaggregated manner for each NSTA element.

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.

Met



Met with Conditions



Not Met



Comment:

Assessment 4 is generic and does not have science-specific criteria in the rubric. There should only be one NSTA element aligned with one criterion in the rubric.

The only assessment that mentions the words "safe" or "safety" is Assessment #6 which explains research opportunities for teacher candidates. It is concerning that neither the lesson plan, unit plan or student teacher observations mention safety. It is suggested that the Unit add this very important concept in these documents and assess it in the classroom and in planning.

Data reporting should be disaggregated by NSTA element by year, program level, and program type.

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:

Assessment 5 is generic and does not have science-specific criteria in the rubric. There should only be one NSTA element aligned with one criterion in the rubric. It is unclear how students demonstrate diversity of students they teach and how they demonstrate they can distinguish between science and non-science and the understanding of evolution. These should be explicit in the rubrics and at this point are missing.

Data reporting should be disaggregated by NSTA element by year, program level, and program type.

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:

Assessments 6 and 7 do not provide evidence for this standard. While 6a and 6b are mentioned as criterion in many other assessments, there are no specific data for each element.

Although REU and Community Project activities are an excellent way to promote professional development, there is no evidence that these activities target inequities and inclusion for all students in science. It would be beneficial to have the assessment rubrics reflect that the notion of student diversity and inclusion are noted.

PART C - EVALUATION OF PROGRAM REPORT EVIDENCE

C.1. Candidates' knowledge of content

Assessment 1 and Assessment 2 provides sufficient evidence that candidates understand the content in

their subject areas. The research project in Assessment 6 further deepens candidates' knowledge on research studies. The other 3 standards are void of these assessments.

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

Because of the generic nature of assessments in this area, evidence is weak or insufficient that candidates have the professional and pedagogical knowledge and skills specific to science as reflected by the NSTA standards.

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

Evidence provided did not demonstrate that the program's candidates are positively impacting P-12 student learning in the areas of described by 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)

No 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

There appears to be a large disparity between the number of candidates enrolled in the program and the number of program completers. For example, in 2012-13, there were 73 candidates enrolled in the program and only 2 completers. Each assessment provides a different number of candidates or "N" for each year.

Student names is encouraged not be visible or used as part of the data presentation. For example, see TPM results document entitled, "Q75222_2013_Results."

There are many areas of concern. In particular, there does not appear to be any evidence collected in multiple pedagogical techniques, inquiry, and or how teacher candidates deal with safety issues in the classroom. These items are targets for the Science NSTA SPA. In addition, there is no evidence that teacher candidates deal with diversity or inclusion in the classroom. These items should be explicit in the rubrics and it does not appear that they are present.

The Content Analysis Form should be included in Assessment 2. Assessment 3, 4 and 5 need to be science specific and use language found in the NSTA standards.

The rubrics for each content-specific Assessment should have one NSTA element aligned with one rubric criterion.

Disaggregated data is suggested to be reported by NSTA element, program year, program level, and program type.

PART F - ADDITIONAL COMMENTS

None.

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

Some documents are written in Spanish which are challenging to the reviewers.

PART G -DECISIONS

Please select final decision:

- Program does not currently satisfy SPA requirements for national recognition.** See below for details.

PROGRAM DOES NOT MEET SPA REQUIREMENTS FOR NATIONAL RECOGNITION

Terms and Subsequent Actions

- National Recognition with Probation** The program does not currently satisfy SPA requirements for national recognition; however, national recognition is retained from the previous review cycle. The program has **up to two opportunities** to submit a Revised Report addressing unmet standards and other concerns noted in this recognition report. The possible deadlines for submitting a Revised Report are 3/15/15, 9/15/15, or 3/15/16. *Note that the opportunity to submit two Revised Reports (if needed) is only possible if the first Revised Report is submitted on or before the 9/15/15 submission deadline; however, the program should NOT submit a Revised Report until it is confident that it has addressed all of the unmet standards and any other critical concerns cited in this recognition report.* If no reports are submitted by 3/15/16, program recognition status will revert to Not Recognized. After 3/15/16, NCATE will not accept a revised report; however, the institution may submit a new, complete program report and initiate a new program review. In states that require NCATE program review, another program report must be submitted before the next NCATE accreditation visit. The program will continue to be listed as nationally recognized on the NCATE website until the end of the semester of the accreditation decision. The institution may designate its program as nationally recognized by NCATE, through the time period specified below, in its published materials. Failure to submit a report by the date below will result in loss of national recognition.

Comment on decision:

Please click "Next"

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