# Program Report for the Preparation of Science Teachers

## National Science Teachers Association (NSTA)

### NATIONAL COUNCIL FOR ACCREDITATION OF TEACHER EDUCATION

## COVER SHEET

1. **Institution Name**
   - Delaware State University

2. **State**
   - Delaware

3. **Date submitted**
   - 03/12/2010

4. **Report Preparer's Information:**
   - **Name of Preparer:** William J. McIntosh
   - **Phone:** (302) 857-6736
   - **Ext.**
   - **E-mail:** bmcintosh@desu.edu

5. **NCATE Coordinator's Information:**
   - **Name:** Dr. Billie Friedland
   - **Phone:** (302) 857-6739
   - **Ext.**
   - **E-mail:** bfriedland@desu.edu

6. **Name of institution's program**
   - Science Education

7. **NCATE Category**
   - Science Education (multiple fields)
8. Grade levels\(^{(1)}\) for which candidates are being prepared

| 7-12 |

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

9. Program Type

- Advanced Teaching
- First teaching license
- Other School Personnel
- Unspecified

10. Degree or award level

- Baccalaureate
- Post Baccalaureate
- Master's
- Post Master's
- Specialist or C.A.S.
- Doctorate
- Endorsement only

11. Is this program offered at more than one site?

- Yes
- No

12. If your answer is "yes" to above question, list the sites at which the program is offered

13. Title of the state license for which candidates are prepared

| Initial |

14. Program report status:

- Initial Review
- Response to One of the Following Decisions: Further Development Required, Recognition with Probation, or Not Nationally Recognized
- Response to National Recognition With Conditions

15. State Licensure requirement for national recognition:

NCATE requires 80% of the program completers who have taken the test to pass the applicable state licensure test for the content field, if the state has a testing requirement. Test information and data must be reported in Section III. Does your state require such a test?

- Yes
- No
SECTION I - CONTEXT

1. Provide the following contextual information:

Description of any state or institutional policies that may influence the application of NSTA standards.
(Respone limited to 4,000 characters.)

The state of Delaware offers a secondary science teacher certificate which is required for grades 9-12 and is valid in middle level school, grades 6-8. Certificates are issued in Biology, Chemistry, Earth Science, Integrated Science, Physical Science and Physics. Delaware State University prepares teachers in all areas but Integrated Science. Delaware regulations require a major to complete a minimum of thirty semester hours of coursework in their content area and all Delaware State University science teacher preparation programs meet this requirement. Graduates of Delaware State University are eligible for issuance of an initial license because they have 1) received a bachelors degree from a regionally accredited university 2) completed a student teaching program 3) passed PRAXIS 1 as a condition of entering into the teacher education program. A standard certification is granted because the science education program prepares candidates in the content required to pass the PRAXIS II.

Institutional policies require all candidates formally apply for admittance into the teacher education program within their respective discipline. For successful admittance students must 1) have a cumulative GPA of 2.5 or higher 2) perform in an acceptable or target range during the candidate interview 3) passed all parts of the PRAXIS 1.

By mandate of the provost, the number of credits required for graduation is no lower than and closely aligned to 120. Fifty hours are mandated general education courses with the remainder either allocated to science or education credit hours.

2. Description of the field and clinical experiences required for the program, including the number of hours for early field experiences and the number of hours/weeks for student teaching or internships. (Response limited to 8,000 characters.)

Description of field and clinical experiences

Candidates are required to complete the following number of early field hours:

12-204 Philosophical Foundations of Education 10 hours
12-313 Introduction to education of the child with exceptional learning needs 10 hours
12-322 Reading in the secondary schools 20 hours
12-210 Methods of Teaching Science 10 hours
12-357 Effective Teaching Strategies in the Classroom 10 hours

Students submit a form for each class to the Office of Clinical and Field Experiences requesting placement. At this time either a request for a specific placement can be made or the EFE office will assume that role. In either case, students placed in local districts find themselves immersed in very diverse student populations. Once accepted into a classroom the candidate is expected to observe and participate if possible. Each course has its own grading parameters as well as content related observation rubrics that complement a generic instrument provided by the EFE office. There is a science-specific observation rubric that is completed by the candidate during the 12-210 methods course. These forms become part of a student’s grade in this course. Cooperating teachers complete placement verification forms and verify student time logs. Cooperating teachers also rate candidates on a rubric that includes criteria such as appearance, punctuality, professionalism, and rapport with students. Finally, teacher candidates complete an EFE reflection instrument.
Teacher candidates enroll, during their final semester, in a 12 credit hour student teaching capstone experience. They are placed in local districts with a licensed, experienced science teacher whose class assignments reflect the candidate’s area of preparation. Candidates are supervised by university science or science education faculty at least 6 times during the semester. An observation rubric is completed at least 4 times during the observations. The generic university observation rubric is supplemented by a science teaching rubric addendum. Completed rubrics are submitted to the Office of Clinical and Field Experiences with a copy given to the candidate and a copy retained by the observer.

With the DSU teaching model, students observe and teach 1-4 daily lessons during the first 5 weeks, teach full days for the next 5 weeks and observe and teach progressively less for the final 5 weeks. During the student teaching semester the student teacher is expected to attend the regularly scheduled seminar meetings planned and conducted by the Director of Field Experiences.

Candidates enter daily teaching summaries along with analyses and reflections into a daily log that is then used by the cooperating teacher and university supervisor to provide written feedback. Additionally, lesson plans are kept on file and are reviewed by both observers.

A Teacher Work Sample is required of all candidates and is a major assignment that is evaluated by a generic DSU rubric that has imbedded science specific criteria.

3. Description of the criteria for admission, retention, and exit from the program, including required GPAs and minimum grade requirements for the content courses accepted by the program. (Response limited to 4,000 characters.)

Delaware State University provides admission to Delaware and out-of-state residents based on criteria established by the Middle States Association of Colleges and Secondary Schools and policies of the University. Delaware State University, in accordance with its mission, is obligated to identify the level of preparedness of the students it admits and to establish appropriate policies that ensure accurate placement of students in courses and academic programs that provide the greatest opportunity for success in their academic pursuits. All applicants, regardless of race, creed, national origin, or handicap, are given equal consideration for admission. Students must submit an official application form, an official transcript indicating the required high school course work, and SAT or ACT scores.

All in-coming freshmen must take the Accuplacer placement tests in reading and writing during summer orientation before they begin their first semester. The Accuplacer results determine whether students are placed in Writing Skills (remedial course), Composition I with Lab (credit course with a supplemental instructor to provide additional academic support in a lab setting), or Honors Composition I.

Transfer students must satisfy all entrance requirements. In addition, they must have a statement of withdrawal from the former institutions and official transcripts of all high school and college work completed. In general, course grades less than a “C” will not be accepted as transfer credit. The transcripts of each individual accepted for transfer will be evaluated in relation to the requirements of the specific academic program for which the student is accepted. Any transfer who wishes to enter into science education meets with their respective advisor who matches courses previously evaluated by university admissions personnel with curricular requirements. That student must then apply to the TEP in the same manner as non-transfer students.
The University takes retention very seriously. Students are assigned an academic advisor early in their first semester. The advisors work closely with their advisees to be sure the students follow the sequential curriculum charts. Only after meeting with their advisor are students given a pin number that allows them to register for courses. Science education majors are advised by full-time professors in their discipline.

All students, including transfer students, are required to take University Seminar, a course focused on providing the students with information they will need to be successful during their college experience. Each department houses its own course which allows the professor to include additional information pertaining to the specific major and allows for a relationship to be built between the major and the department faculty. Majors are encouraged to apply to the Teacher Education Program (TEP) during the second semester of the freshman year. They must have a 2.5 or higher GPA to be eligible for admission into the TEP and to be eligible to remain in the program. To support student retention, the Unit has invested in Plato Webb to help students prepare for taking Praxis I. Education majors are kept informed about all aspects of the education program through majors’ meetings held every semester. At the beginning of the senior year, the department chair completes the senior audit for all majors. Majors must pass the audit and have a 2.5 or higher GPA with no grade less than a C in an English or education course. Before student teaching, the science education major must also pass the appropriate Praxis II with a passing score.

4. Description of the relationship of the program to the unit’s conceptual framework (Response limited to 4,000 characters.)

The philosophy for science teacher preparation at Delaware State University is to place into the nation’s school systems exemplary teachers and role models who are committed to providing meaningful and relevant education to a diverse student population, who in turn will become competent, productive, and contributing citizens. Faculty in the science education program are individuals dedicated to developing and mentoring informed professionals who are empowered to teach students who will lead and manage change while shaping society's future.

The knowledge base of the science education program is based upon contemporary research and practice and is guided by the standards and ethics of the various professional organizations such as the American Chemical Society, and the National Science Teachers Association.

The acronym DIRECT represents the core of the university’s conceptual framework and serves to identify a common knowledge base adopted by science education faculty. D.I.R.E.C.T means: Diversity, Interpersonal Communications, Reflection, Effective Teaching and Assessment Strategies, Content and Pedagogical Knowledge.

See Separate Table.

5. Indication of the unique set of program assessments for science and their relationship of the program’s assessments to the unit’s assessment system (Response limited to 4,000 characters.)

The key assessments in the program are subsumed under the unit assessment system and occur at various stages in a candidate’s program. The first chart shows specifically where in the program each unique set of program assessments for science is conducted while the bottom chart shows more of an
This response should clarify how the key assessments used in the program are derived from or informed by the assessment system that the unit will address under NCATE Standard 2.

6. This system will not permit you to include tables or graphics in text fields. Therefore any tables or charts must be attached as files here. The title of the file should clearly indicate the content of the file. Word documents, pdf files, and other commonly used file formats are acceptable. The system will not accept .docx files. Please include all information on an assessment (directions, scoring guide, data, and reflections on changes) in a single document. Note that if using MS Word, files must be in a version prior to MS Vista.

| Table for #4, Relationship of Program to Conceptual Framework | Table for #5, Science Assessment Alignment |
| Table for #5, Unit Assessment Timeline |

See Attachments panel below.

7. Attach the following contextual information:
1. A program of study that outlines the courses and experiences required for candidates to complete the program. The program of study must include course titles and numbers. (This information may be provided as an attachment from the college catalog or as a student advisement sheet.) AND forms showing requirements for science content courses for post degree or master’s programs. Syllabi and course descriptions are not generally necessary (some exceptions may be in Assessment #2, the Content Analysis form). Please include directions for each level of candidate (e.g., undergradtuate advising sheet and post degree or graduate advising sheet.)

(Response limited to 6 pages)

| Science Education Curriculum Sheet | Physics Curriculum Sheet |
| Biology Curriculum Sheet |

See Attachments panel below.

8. Candidate Information
Directions: Provide three years of data on candidates enrolled in the program and completing the program, beginning with the most recent academic year for which numbers have been tabulated. Report the data separately for the levels/tracks (e.g., baccalaureate, post-baccalaureate, alternate routes, master's, doctorate) being addressed in this report. Report the data separately for each licensure area (e.g., chemistry, biology, broad field science, middle level). Data must also be reported separately for programs offered at multiple sites. Update academic years (column 1) as appropriate for your data span. Create additional tables as necessary.
NCATE uses the Title II definition for program completers. Program completers are persons who have met all the requirements of a state-approved teacher preparation program. Program completers include all those who are documented as having met such requirements. Documentation may take the form of a degree, institutional certificate, program credential, transcript, or other written proof of having met the program’s requirements.

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<tr>
<th>Academic Year</th>
<th># of Candidates Enrolled in the Program</th>
<th># of Program Completers</th>
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<td>05-06</td>
<td>4</td>
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<td>06-07</td>
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<tr>
<td>07-08</td>
<td>2</td>
<td>1</td>
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</table>

9. Faculty Information

Directions: Complete the following information for each faculty member responsible for science education professional coursework, clinical supervision, or administration in this program. This may be the science educator(s) or others directly involved in teaching science education portion of the licensure program.

<table>
<thead>
<tr>
<th>Faculty Member Name</th>
<th>Dr. William J. McIntosh</th>
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</thead>
<tbody>
<tr>
<td>Highest Degree, Field, &amp; University</td>
<td>D.ED. Science Education Temple University</td>
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<tr>
<td>Assignment: Indicate the role of the faculty member</td>
<td>Faculty: Program Coordinator: Science Education</td>
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<tr>
<td>Faculty Rank</td>
<td>Professor</td>
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<tr>
<td>Tenure Track</td>
<td>YES</td>
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<td>Scholarship, Leadership in Professional Associations, and Service: List up to 3 major contributions in the past 3 years</td>
<td>2008 MSP grant: work with science teachers in two local school districts. Reviewer for Journal for College Science Teaching. Serve on State of Delaware advisory committee to review items for the state science test.</td>
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<tr>
<td>Teaching or other professional experience in P-12 schools</td>
<td>Teach Earth/Space science, Science Methods, Science Education Graduate Courses</td>
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</table>

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<tr>
<th>Faculty Member Name</th>
<th>Dr. Anuradha Dujari</th>
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<tbody>
<tr>
<td>Highest Degree, Field, &amp; University</td>
<td>Ed.D, Wilmington University</td>
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<tr>
<td>Assignment: Indicate the role of the faculty member</td>
<td>Science education faculty</td>
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<tr>
<td>Faculty Rank</td>
<td>Professor</td>
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<td>Tenure Track</td>
<td>YES</td>
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<tr>
<td>Scholarship, Leadership in Professional Associations, and Service: List up to 3 major contributions in the past 3 years</td>
<td>Faculty Advisor, NASA Pre-service Teacher Conference, Alexandria, VA Member, Toshiba/NSTA Exploravision Awards Committee Advisory Board Member, Journal of College Science Teaching</td>
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<tr>
<td>Teaching or other professional experience in P-</td>
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</table>
(5) e.g., PhD in Curriculum & Instruction, University of Nebraska. 
(6) e.g., faculty, clinical supervisor, department chair, administrator 
(7) e.g., professor, associate professor, assistant professor, adjunct professor, instructor 
(8) Scholarship is defined by NCATE as systematic inquiry into the areas related to teaching, learning, and the education of teachers and other school personnel. Scholarship includes traditional research and publication as well as the rigorous and systematic study of pedagogy, and the application of current research findings in new settings. Scholarship further presupposes submission of one's work for professional review and evaluation. 
(9) Service includes faculty contributions to college or university activities, schools, communities, and professional associations in ways that are consistent with the institution and unit's mission. 
(10) e.g., officer of a state or national association, article published in a specific journal, and an evaluation of a local school program. 
(11) Briefly describe the nature of recent experience in P-12 schools (e.g. clinical supervision, inservice training, teaching in a PDS) indicating the discipline and grade level of the assignment(s). List current P-12 licensure or certification(s) held, if any.

**SECTION II - LIST OF ASSESSMENTS**

1. In this section, list the 6-8 assessments that are being submitted as evidence for meeting the NSTA standards. All programs must provide a minimum of six assessments. If your state does not require a state licensure test in the content area, you must substitute an assessment that documents candidate attainment of content knowledge in #1 below. For each assessment, indicate the type or form of the assessment and when it is administered in the program.

<table>
<thead>
<tr>
<th>Type and Number of Assessment</th>
<th>Name of Assessment (12)</th>
<th>Type or Form of Assessment (13)</th>
<th>When the Assessment Is Administered (14)</th>
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<tr>
<td>Assessment #1: Content Knowledge - Licensure Tests</td>
<td>Science content PRAXIS II.</td>
<td>National test</td>
<td>Prior to admission into student teaching.</td>
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<td>15 (required)</td>
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<td>Assessment #2: Content Knowledge - an assessment of general content knowledge in discipline to be taught (required)</td>
<td>Science Content Analysis Forms. GPA</td>
<td>Data analysis and survey data</td>
<td>Overall and science GPA of program completers.</td>
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<td>Assessment #3: Pedagogical and Professional Knowledge, Skills and Dispositions - Planning instruction and assessment (required)</td>
<td>Unit Plan</td>
<td>Unit Plan</td>
<td>Science methods course and student teaching.</td>
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<td>Assessment #4: Pedagogical and Professional Knowledge, Skills and Dispositions - Student Teaching Assessment (required)</td>
<td>Student Teaching Observation Rubric</td>
<td>Observations over time</td>
<td>During the student teaching experience as a formative and summative assessment tool.</td>
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<td>Assessment #5: Effects on Student Learning (required)</td>
<td>Teacher Work Sample</td>
<td>Comprehensive written report</td>
<td>End of student teaching experience</td>
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Assessment #6: Pedagogical and Professional Knowledge, Skills and Dispositions - Legal/Safety/Ethical Issues (required)  
Safety Module  
Series of related assignments presented in written and/or visual forms.  
Methods course and student teaching experience.

Assessment #7: Content Knowledge - Research & Investigation (required)  
Research Investigation  
Project  
Short project embedded in a selected science course in each discipline.

Assessment #8: Content Knowledge - Contextual Content (required)  
Contextual Content assignments  
Series of assignments that together meet standard 8.  
Methods course

(12) Identify assessment by title used in the program; refer to Section IV for further information on appropriate assessment to include.
(13) Identify the type of assessment (e.g., essay, case study, project, comprehensive exam, reflection, state licensure test, portfolio).
(14) Indicate the point in the program when the assessment is administered (e.g., admission to the program, admission to student teaching/internship, required courses [specify course title and numbers], or completion of the program).
(15) If licensure test data is submitted as Assessment #1, the assessment and scoring guide attachments are not required. If the state does not require a licensure test, another content based assessment must be submitted (including the assessment and scoring guide).

SECTION III - RELATIONSHIP OF ASSESSMENT TO STANDARDS

For each NSTA standard on the chart below, identify the assessment(s) in Section II that address the standard. One assessment may apply to multiple NSTA standards.

1. NSTA Standards

Content. Teachers of science understand and can articulate the knowledge and practices of contemporary science. They can interrelate and interpret important concepts, ideas, and applications in their fields of licensure; and can conduct scientific investigations. To show that they are prepared in content, teachers of science must demonstrate that they

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2. *Nature of Science.* Teachers of science engage students effectively in studies of the history, philosophy, and practice of science. They enable students 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. To show they are prepared to teach the nature of science, teachers of science must demonstrate that they:

(a) understand the historical and cultural development of science and the evolution of knowledge in their discipline; 

(b) understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world;

(c) engage students successfully in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science

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3. *Inquiry.* Teachers of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences. To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they:

(a) understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge;

(b) engage students successfully 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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4. *Issues.* Teachers of science recognize that informed citizens must be prepared to make decisions and take action on contemporary science- and technology-related issues of interest to the general society. They require students to conduct inquiries into the factual basis of such issues and to assess possible actions and outcomes based upon their goals and values. To show that they are prepared to engage students in studies of issues related to science, teachers of science must demonstrate that they:

(a) understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues;

(b) engage students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students.

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5. *General Skills of Teaching.* Teachers of science create a community of diverse learners who construct meaning from their science experiences and possess a disposition for further exploration and learning. They use, and can justify, a variety of classroom arrangements, groupings, actions, strategies,
and methodologies. To show that they are prepared to create a community of diverse learners, teachers of science must demonstrate that they

(a) vary their teaching actions, strategies, and methods to promote the development of multiple student skills and levels of understanding;
(b) successfully promote the learning of science by students with different abilities, needs, interests, and backgrounds;
(c) successfully organize and engage students in collaborative learning using different student group learning strategies;
(d) successfully use technological tools, including but not limited to computer technology, to access resources, collect and process data, and facilitate the learning of science;
(e) understand and build effectively upon the prior beliefs, knowledge, experiences, and interests of students; and
(f) create and maintain a psychologically and socially safe and supportive learning environment.

6. Curriculum. Teachers of science plan and implement an active, coherent, and effective curriculum that is consistent with the goals and recommendations of the National Science Education Standards. They begin with the end in mind and effectively incorporate contemporary practices and resources into their planning and teaching. To show that they are prepared to plan and implement an effective science curriculum, teachers of science must demonstrate that they:

(a) understand the curricular recommendations of the National Science Education Standards, and can identify, access, and/or create resources and activities for science education that are consistent with the standards;
(b) plan and implement internally consistent units of study that address the diverse goals of the National Science Education Standards and the needs and abilities of students.

7. Science in the Community. Teachers of science relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional, and natural resources of the community in their teaching. They actively engage students in science-related studies or activities related to locally important issues. To show that they are prepared to relate science to the community, teachers of science must demonstrate that they:

(a) identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science;
(b) involve students successfully in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community.

8. Assessment. Teachers of science construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social, and personal development. They assess students fairly and equitably, and require that students engage in ongoing self-assessment. To show that they are prepared to use assessment effectively, teachers of science must demonstrate that they:
(a) use multiple assessment tools and strategies to achieve important goals for instruction that are aligned with methods of instruction and the needs of students;  
(b) use the results of multiple assessments to guide and modify instruction, the classroom environment, or the assessment process;  
(c) use the results of assessments as vehicles for students to analyze their own learning, engaging students in reflective self-analysis of their own work.

9. Safety and Welfare. Teachers of science organize safe and effective learning environments that promote the success of students and the welfare of all living things. They require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field. To show that they are prepared, teachers of science must demonstrate that they:

(a) understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials;  
(b) know and practice safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction;  
(c) know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the abilities of students;  
(d) treat all living organisms used in the classroom or found in the field in a safe, humane, and ethical manner and respect legal restrictions on their collection, keeping, and use.

NOTE: A program must meet Standard 9a, b and c in order to receive either National Recognition or National Recognition with Conditions. Evidence must be shown in assessment 4 and assessment 6. Further information is available at the following URL: www.nsta.org/preservice

10. Professional Growth. Teachers of science strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community, and profession. They have a desire and disposition for growth and betterment. To show their disposition for growth, teachers of science must demonstrate that they:

(a) engage actively and continuously in opportunities for professional learning and leadership that reach beyond minimum job requirements;  
(b) reflect constantly upon their teaching and identify ways and means through which they may grow professionally;  
(c) use information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth;  
(d) interact effectively with colleagues, parents, and students; mentor new colleagues; and foster positive relationships with the community.

SECTION IV - EVIDENCE FOR MEETING STANDARDS
DIRECTIONS: The 6-8 key assessments listed in Section II must be documented and discussed in Section IV. The assessments must be those that all candidates in the program are required to complete and should be used by the program to determine candidate proficiencies as expected in the program standards. Assessments and scoring guides should be aligned with the SPA standards. This means that the concepts in the SPA standards should be apparent in the assessments and in the scoring guides to the same depth, breadth, and specificity as in the SPA standards.

In the description of each assessment below, the SPA has identified potential assessments that would be appropriate. Assessments have been organized into the following three areas that are addressed in NCATE’s unit standard 1:
- Content knowledge (Assessments 1 and 2)
- Pedagogical and professional knowledge, skills and dispositions (Assessments 3 and 4)
- Focus on student learning (Assessment 5)

Note that in some disciplines, content knowledge may include or be inextricable from professional knowledge. If this is the case, assessments that combine content and professional knowledge may be considered "content knowledge" assessments for the purpose of this report.

For each assessment, the compiler should prepare a document that includes the following items: a two page narrative that responds to questions 1, 2, 3, and 4 (below) and the three items listed in question 5 (below). This document should be attached as directed.

1. A brief description of the assessment and its use in the program (one sentence may be sufficient);
2. A description of how this assessment specifically aligns with the standards it is cited for in Section III. Cite SPA standards by number, title, and/or standard wording.
3. A brief analysis of the data findings;
4. An interpretation of how that data provides evidence for meeting standards, indicating the specific SPA standards by number, title, and/or standard wording; and
5. Attachment of assessment documentation, including:
   (a) the assessment tool or description of the assignment;
   (b) the scoring guide for the assessment; and
   (c) candidate data derived from the assessment.

It is preferred that the response for each of 5a, 5b, and 5c (above) be limited to the equivalent of five text pages, however in some cases assessment instruments or scoring guides may go beyond five pages.

All three components of the assessment (as identified in 5a-c) must be attached, with the following exceptions: (a) the assessment tool and scoring guide are not required for reporting state licensure data, and (b) for some assessments, data may not yet be available.

1. **CONTENT KNOWLEDGE:** Data from licensure tests of content knowledge in science education. If your state does not require licensure tests in the content area, data from another assessment must be presented to document candidate attainment of content knowledge. The NSTA standard that could be addressed by this assessment includes, but is not limited to, Standard 1a.

Provide assessment information (items 1-5) as outlined in the directions for Section IV
1. The names of all licensure tests or professional examinations required by the state for content and pedagogical or professional knowledge.
2. Description of the alignment between licensure test data and applicable NSTA standards. However, if
the test is a science content Praxis II test, the alignment is not required (e.g., Praxis II 20235: Biology Content).

3. Aggregated pass rates for each year over the past 3 years, including the most recent academic year. 19
Data must be presented on all completers, even if there were fewer than 10 test takers during a single year. Eighty percent of program completers 20 who have taken the content test must pass the applicable state licensure test if the state has such a test.

4. The mean and range of sub-scores for the most recent academic year.

5. A single attachment of assessment documentation, including:
(a) the assessment tool or description of the assignment;
(b) the scoring guide for the assessment; and
(c) candidate data derived from the assessment.
Data should be in aggregate form (not scores for each candidate) and disaggregated by licensure area (biology, chemistry, middle school, etc) and by program (undergraduate, post degree, masters of teaching).
(d) reflections on any rubric changes and why those changes occurred may be included here.
The narrative section for each assessment (1-5 above) is limited to two text pages. If the attachment exceeds the file size limit by NCATE, break the attachment into logical parts.

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**Assessment 1 PRAXIS Data**

See Attachments panel below.

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(18) For example, Praxis II Biology: Content Knowledge.
(19) NCATE will provide a link to a sample response for this requirement.
(20) NCATE uses the Title II definition for program completers. Program completers are persons who have met all the requirements of a state-approved teacher preparation program. Program completers include all those who are documented as having met such requirements. Documentation may take the form of a degree, institutional certificate, program credential, transcript, or other written proof of having met the program’s requirements.

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**2. CONTENT KNOWLEDGE:** An assessment that demonstrates candidate knowledge of the conceptual science to be taught and related fields. An assessment that demonstrates that candidates are well prepared in the breadth of knowledge needed to teach in their fields of licensure. The NSTA standard that could be addressed by this assessment includes, but is not limited to, Standard 1a.

Assessments could include content grade point averages and minimum grade requirements, portfolio requirements, or comprehensive examinations suitable for preparing teachers of a curriculum based on the content recommendations in the 2003 NSTA Standards 1a.

Provide assessment information (items 1-5) as outlined in the directions for Section IV in a single attachment

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**Grades in Science Courses**

<table>
<thead>
<tr>
<th>Grades in Science Courses</th>
<th>Content Analysis</th>
</tr>
</thead>
</table>

See Attachments panel below.

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**3. PEDAGOGICAL AND PROFESSIONAL KNOWLEDGE, SKILLS, AND DISPOSITIONS:**
An assessment that demonstrates candidates can plan effective classroom-based instruction, and design assessments, consistent with goals of the National Science Education Standards. NSTA standards that could be addressed by this assessment include, but are not limited to, standards 1a, 1b, 1c, 2c, 3b, 4b, 6,
A minimum indicator might include performance in the design of at least one major demonstration teaching unit (not a single lesson plan) aligned with goals as reflected in breadth of NSTA standards 1a-c, 2c, 3b, 4b, 6, 7b, and 8 (with lesson plans and varied assessments).

Provide assessment information (items 1-5) as outlined in the directions for Section IV

A minimum indicator might include performance in the design of at least one major demonstration teaching unit (not just a single lesson plan) that includes requirements for activities addressing unifying concepts, nature of science, inquiry, issues, personal and technological applications, and science in the community (with lesson plans and varied assessments).

Provide assessment information (items 1-5) as outlined in the directions for Section IV in a single attachment

<table>
<thead>
<tr>
<th>Assessment 3 Narrative</th>
<th>Unit Plan Guidelines and Rubrics</th>
</tr>
</thead>
</table>

See Attachments panel below.

4. PEDAGOGICAL AND PROFESSIONAL KNOWLEDGE, SKILLS, AND DISPOSITIONS: Assessment that demonstrates candidates' knowledge, skills, and dispositions are applied effectively in practice. NSTA standards that could be addressed by this assessment include, but are not limited to, standard 9. The assessment instrument used in student teaching and the internship should be submitted.

An indicator could include performances on a subset of items from a student teaching observation form with each area of safety addressed explicitly: 9a- Legal and ethical, 9b – Safety procedures, 9c – Chemical use and storage and 9d – Use and care of animals.

NOTE: Safety is the most important part of learning to be a science teacher. Therefore, this assessment must explicitly address all aspects of the standard for a program with enough substance to ensure to external reviewers that preservice teachers are prepared and are able to address in student teaching in all areas of safety in the teaching of science.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

An indicator could include performance in an internship that is evaluated using an observation form filled out by the cooperating teacher and supervisor.

Provide assessment information (items 1-5) as outlined in the directions for Section IV in a single attachment

<table>
<thead>
<tr>
<th>Assessment 4 Narrative</th>
<th>Generic And Science Specific Student Teaching Observation Instrument</th>
</tr>
</thead>
</table>

See Attachments panel below.

5. EFFECTS ON STUDENT LEARNING: An assessment that demonstrates candidate effects on student learning of major concepts, principles, theories, laws; the unifying concepts of science; the nature of science; the practice of inquiry (including student engagement in inquiry); analysis of issues related to science and technology and the impact of science on themselves and their community. NSTA
standards that must be addressed by this assessment include, but are not limited to, standards 1a, 2c, 3b and 4b.

An indicator might include an assessment of candidate on work samples aligned that is specific to science and explicitly evaluates each of the standards above. Work samples may include pre and post test data with analysis and reflections.

**Provide assessment information (items 1-5) as outlined in the directions for Section IV in a single attachment**

<table>
<thead>
<tr>
<th>Combined Generic and Science Teacher Work Sample</th>
<th>Assessment 5 Narrative</th>
</tr>
</thead>
</table>

See **Attachments** panel below.

**6. PEDAGOGICAL AND PROFESSIONAL KNOWLEDGE, SKILLS, AND DISPOSITIONS:** An assessment that demonstrates candidates are prepared in legal issues, safety, and ethical treatment of living things. The NSTA standard addressed by this assessment includes, but is not limited to, standard 9.

Assessments might include performance in a safety module with minimum levels of performance in each of the areas: 9a, 9b, 9c and 9d. This assessment must address safety knowledge and understanding that a science teacher needs to know and be able to do.

**NOTE:** Safety is the most important part of learning to be a science teacher. Therefore, this assessment must clearly address all aspects of the standard for a program with enough substance to ensure to external reviewers that preservice teachers are prepared in all areas of safety in the teaching of science.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

<table>
<thead>
<tr>
<th>Assessment 6 Narrative</th>
<th>Safety Module</th>
</tr>
</thead>
</table>

See **Attachments** panel below.

**7. CONTENT KNOWLEDGE:** An assessment that demonstrates knowledge of research and investigation in science. Candidates understand multiple forms of scientific inquiry; can design, conduct, and report research in their field; and can use mathematics and appropriate technology to collect, process, and explain data. NSTA standards that could be addressed by this assessment include, but are not limited to, standards 1d-e.

Assessments might include performance in or on a science content thesis, science research project, occupational experience in scientific research, or some similar confirmed experiences in the design of research in science, with criteria aligned with requirements of this assessment. This includes the candidate designing the experiment, collecting the data, analyzing the data and reporting on the data.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

<table>
<thead>
<tr>
<th>Assessment 7 narrative</th>
<th>Research Design Assignments and rubrics</th>
</tr>
</thead>
</table>

See **Attachments** panel below.
8. CONTENT KNOWLEDGE: An assessment that demonstrates knowledge of the contextual content of science. An assessment that demonstrates candidates have a strong understanding of the socially relevant issues, inquiry, history, philosophy and applications of science. NSTA standards addressed by this assessment include, but are not limited to 2a-b, 3a, and 4a.

Assessments might include performance in a course specifically designed to cover these topics, or performance on a portfolio subset with requirements specifically demonstrating preparation in the knowledge identified in this assessment.

Provide assessment information (items 1-5) as outlined in the directions for Section IV in the directions for Section IV in a single attachment.

<table>
<thead>
<tr>
<th>Assessment 8 Narrative</th>
<th>Assessment 8 Guidelines and Rubrics</th>
</tr>
</thead>
</table>

See Attachments panel below.

SECTION V - USE OF ASSESSMENT RESULTS TO IMPROVE PROGRAM

1. Evidence must be presented in this section that assessment results have been analyzed and have been or will be used to improve candidate performance and strengthen the program. This description should not link improvements to individual assessments but, rather, it should summarize principal findings from the evidence, the faculty's interpretation of those findings, and changes made in (or planned for) the program as a result. Describe the steps program faculty has taken to use information from assessments for improvement of both candidate performance and the program. This information should be organized around (1) science content knowledge, (2) professional and pedagogical knowledge, skill, and dispositions, and (3) student learning.

(Response limited to 12,000 characters)

The data presented in this report is limited in scope since the number of students enrolled in the science education program at Delaware State University is small. While tentative interpretations can be made, one must be careful not to make significant program changes based on these interpretations. Nevertheless there are areas that come to our attention.

Curricula in each discipline are aligned to NSTA content standards, although some improvement is needed. In particular all disciplines need to better address applications of science content. Earth sciences need to infuse in the course of study the impact of earth changes on the evolution of living things and biology needs to look for instructional opportunities to address bioenergetics.

Candidate’s grades in science courses are excellent and PRAXIS II data suggests they are adequately prepared in their discipline. Student teachers are consistently rated acceptable or target on their teaching observation forms and thus demonstrate knowledge of subject matter in the classroom. Nature of science and unifying principles are part of the methods course but it is felt that these subjects need to be embedded more in content courses. We are currently working on this and have designated the Earth/Space science course as one in which systems, models, and other unifying concepts are made explicit and are more fully developed. There also is a concern that nature of science and unifying concepts are not sufficiently addressed during field experiences. We are planning on instituting a protocol for use...
Research experiences are now embedded in each discipline’s curricula. We recognize this as a past weakness and have moved aggressively to rectify the situation.

Data from the Unit Plan suggests candidates are able to demonstrate professional and pedagogical knowledge at a target level. They are able to develop inquiry lessons, identify and debate scientific and technological issues, and design investigations. We struggle however with the opportunities afforded candidates to demonstrate their ability to deliver extended inquiry lessons in clinical situations. Cooperating teachers typically restrict the type of lessons they allow students to present in their classes. Teachers are under pressure to “cover” state standards and in many cases view extended inquiry or issues oriented instruction as being too time restrictive. Candidates often are allowed only to complete short term inquiry lessons so they may show compliance with university expectations as presented on the observation form. We are attempting to address this situation by establishing greater communication and dialog with cooperating teachers both before and during placement.

Candidate skills and dispositions meet target expectations on the Teacher Work Sample and the dispositions instrument administered during the science methods class. Students who show unacceptable dispositions are required to meet with their advisor and develop a plan for addressing their problems. Failure to follow this plan will result in non-admittance into student teaching. The education department is currently working to tighten this requirement.

Students are required to develop multiple assessments as part of their unit plan. Grades are generally good and students are capable of extrapolating a genuine ability to measure student learning during their clinical experiences. There is however, a need to provide more opportunities for candidates to construct alternative assessments during the student teaching experience. We anticipate meeting this need as we work with cooperating teachers to support longer inquiry lessons that can be assessed in more comprehensive ways. Finally, analysis of field diaries indicates candidates use student data to modify instruction.

SECTION VI - FOR REVISED REPORTS OR RESPONSE TO CONDITIONS REPORTS ONLY

1. Describe what changes or additions have been made in response to issues cited in previous recognition report. List the sections of the report you are resubmitting and the changes that have been made. Specific instructions for preparing a revised report or a response to condition report are available on the NCATE web site at http://www.ncate.org/institutions/process.asp?ch=4 (Response limited to 24,000 characters.)
This is the end of the report. Please click "Next" to proceed.