SECTION IV – EVIDENCE FOR MEETING STANDARDS

Assessment 1:
Candidate PRAXIS II scores

(1) 2 page max. narrative
a. Description of the assessment and its use in the program

In this assessment, candidate ETS-PRAXIS II scores are collected and analyzed to ensure that TCNJ science candidates are proficient across their prospective content licensure areas. The Praxis II: Science area content-specific exams (Biology, Chemistry, or Physics) that are offered by the Educational Testing Service (ETS) are required for New Jersey state licensure in those areas. The ETS Praxis General Science Exam is also required for licensure in NJ. The PRAXIS II scores are broken down by licensure area (Biology, Chemistry, and Physics).

b. A description of how this assessment specifically aligns with the elements and standards it is cited for in Section III. Cite SPA standards by number, title, and/or standard wording.

NSTA Standards Addressed by this assessment:
NSTA Standard 1: Content Knowledge including the following elements: 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.

c. A brief analysis of the data findings;

We have reviewed Praxis II exam scores by exam score and category subscores for all BIO, CHE, and PHY students from 2015 through scores received to present (note that no scores have been received for 2019). These scores include **10** Biology candidates, **3** Chemistry Candidates and **12** Physics Candidates. 23 of 25 students in this time period passed all required exams on their first attempt. It is important to note that students are being encouraged to take the Praxis exams earlier than in the past; this means their content preparation is not complete when they take these exams. Thus, content knowledge at program completion will be greater than indicated by these already strong results. The small sample statistics are insufficient to make statistically significant claims about program level-trends over time.

Biology: According to the data on scores for undergraduate students who took the Praxis Exam #0235 Biology: Content Knowledge Exam, 9 of 10 exam takers during this period passed the exam. The scores revealed a decrease, then increase between the years 2015-2018. In the year 2015-2016 with a sample of 2 test-takers, the average Praxis score of students was 178.50. In the year 2016-2017 with a sample of 4 test-takers, the average Praxis score of students decreased by 12.25 points to 166.25 and in the year 2017-2018 with a sample of 4 test-takers also, the students' score average increased by 1.00 point to 167.25.

Chemistry

For Praxis #0245 Chemistry: Content Knowledge Exam, all 3 exam takers passed the exam. Due to limited numbers of undergraduate student participation, analysis in change of scores from 2015-2018 cannot be conducted.

Physics

For Praxis #0265 Physics: Content Knowledge Exam, 11 of 12 exam takers during this period passed the exam. Due to limited numbers of undergraduate student participation, a full analysis in change of scores from 2015-2018 cannot be conducted; however, the data demonstrates that between the years 2015-2017, there was an increase in average score for this exam. In 2015-2016 with a sample of 8 test-takers, students averaged at 153.00 and in 2016-2017 with a sample of 4 test-takers, the average score increased by 4.50 points to 157.50.

General Science

According to the data on scores for undergraduate students who took the Praxis Exam #5435 General Science: Content Knowledge Exam, the scores revealed a decrease than increase between the years 2015-2018. In the year 2015-2016 with a sample of 11 test-takers, the average Praxis score of students was 166.00. In the year 2016-2017 with a sample of 10 test-takers, the average Praxis score of students decreased by 1.40 points to 164.60 and in the year 2017-2018 with a sample of 6 test-takers, the students' score average increased by 4.90 points to 169.50.

d. An interpretation of how that data provides evidence for meeting standards, indicating the specific SPA standards by number, title, and/or standard wording;

TCNJ science licensure candidates are passing the science content area PRAXIS II and Praxis General Science exams with scores that are higher than the national median in all three content areas in all years. This demonstrates that NSTA standard 1a) is being met in each discipline.

(2) Assessment Documentation

e. The assessment tool itself or a rich description of the assessment

PRAXIS II - #0235 - Biology Content Knowledge; 150 MC questions, 2 hrs.
PRAXIS II - #0245 - Chemistry Content Knowledge; 100 MC questions, 2 hrs.
PRAXIS II - #0265 – Physics Content Knowledge; 100 MC questions, 2 hrs.
Praxis Exam #5435 - General Science; 135 MC questions, 2.5 hrs.

f. The scoring guide for the assessment;

In Biology, the PRAXIS II passing score is 152, the national median score over this period is 163.

In Chemistry, the PRAXIS II passing score is 152, the national median score over this period has been 160.

In Physics, the PRAXIS II passing score is 141, the national median is 151 over the past 3 years of available data.

For General Science, the passing score is 152, the national median is 164 over this period.

g. Charts that provide candidate data derived from the assessment.

	2015-2016	2016-2017	2017-2018	2019	Total	Pass score USA median
Biology Number	2	4	4	0	**10**	n/a
Biology avg. scores and ranges	178.5 172-185	166.25 150-178	167.25 158-174	n/a	**169.1** **150-185**	152 163
Chemistry number	0	3	0	0	**3**	n/a
Chemistry avg. scores and ranges	n/a	165.3 159-176	n/a	n/a	**165.3** **159-176**	152 160
Physics number	8	4	0	0	**12**	n/a
Physics avg. scores and range	153 137-171	157.5 149-167	n/a	n/a	**154.5** **137-171**	141 151
General Sci number	11	10	6	0	**27**	n/a
General Sci avg. scores and ranges	166 152-183	164.6 131-179	169.5 143-193	n/a	**166.3** **131-193**	152 164

The small number of students in our programs means that the interpretation of collected assessment data is significantly limited from a statistical perspective. With the number of students in the single digits for most assessments, even the composite of the assessment results say nearly as much about the quality of individual students as they do about the quality of our programs. Furthermore, year-to-year enrollment variability is high. These small numbers and the high variability of enrollment do serve as a challenge to making strong conclusions based on the assessments as well as to maintaining an efficiently administered program. Nevertheless, we are working hard to glean programmatic-scale ratiocinations from the assessment data; based on this work, we are confident that are programs are well-designed and producing well-prepared, outstanding teachers. In the paragraphs that follow, we present evidence that we are thoughtfully reflecting on the CAEP/NSTA assessments and using this data to strengthen the overall state of our science teacher education programs.

Despite the small numbers, we view the contributions of these programs as being very important. The graduating students are highly sought- after for employment and have enjoyed strong post-graduate success, making important contributions to science education in New Jersey.

Review of Praxis scores from 2016-present show that our students are performing well on content-area exams. We achieved a 92% pass rate (23/25 students). Biology, Chemistry, and Physics students achieved average scores well above the pass-rate and significantly above the national median. These strong scores on a nationally-normed exam provide strong evidence that our students are acquiring a strong content basis in their fields of study. We believe that a primary reason for this success is that our candidates are held to the same fundamental content requirements as non-teacher training science candidates in the TCNJ School of Science. The Biology, Chemistry, and Physics majors lead to a B.S. degree (although an optional B.A. in Biology has just been added as of Fall 2018), and these degrees include a higher number of content and correlate requirements than any other teacher training degree on campus.

Each of the three programs have also made curricular changes over the past several years to ensure that teacher candidates are fully engaged in the training related to the scientific method and the process of scientific discovery. Each department has recently strengthened their colloquium series of distinguished visiting speakers and taken steps (such as required attendance through the PHY299 and BIO 498 courses) to ensure that science teacher candidates actively engage in these events. The importance of participating in the scientific intellectual community and the process of scientific discovery is

underscored by the implementation of NSTA/CAEP assessment 6, on which our students are performing well. We also emphasize not only content knowledge (assessments 1 and 2), but also the students' ability to acquire, synthesize, apply and finally, to communicate that knowledge in both written and oral form. The demonstration of these skills is evident by our students' performance on assessment 6. Our curricula require that at least two discipline-specific, writing-intensive courses be taken by all students, so high GPA's (assessment 2) also indirectly reflect this proficiency. In order to be recommended for teacher certification, TCNJ requires a 3.0 GPA at graduation. Thus, we hold our teacher candidates to high academic standards.