Program Report for the Preparation of Secondary Mathematics Teachers National Council of Teachers of Mathematics (NCTM) 2012 Standards - Option A

NCATE approved the 2012 NCTM Standards in 2012. Beginning in Spring 2015, programs submitting reports must use the 2012 Standards.

COVER SHEET

1. **Institution Name: The College of New Jersey**

2. **State: NJ**

3. **Date submitted**
   07 17 2019

4. **Report Preparer's Information:**
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6. **Name of institution's program: Mathematics Secondary Education**

7. **CAEP Category**
   - **Secondary Mathematics**

8. **Grade levels(1) for which candidates are being prepared**
   K-12

9. **Program Type**

First teaching license

10. **Degree or award level**

    Baccalaureate (B.S.)

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

    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: K-12 Mathematics**

14. **Program report status:**

    Initial Review

15. **Is your Educator Preparation provider (EPP) seeking**

    Continuing CAEP accreditation

16. **State Licensure data requirement on program completers disaggregated by specialty area with sub-area scores: CAEP requires programs to provide completer performance data on state licensure examinations for completers who take the examination for the content field, if the state has a licensure testing requirement. Test information and data must be reported in Section IV. Does your state require such a test?**

    Yes

SECTION I - CONTEXT

1. **Description of any state or institutional policies that may influence the application of NCTM standards. (Response limited to 4,000 characters INCLUDING SPACES)**

Since the September 2015 NCATE accreditation visit, the secondary education program has undergone multiple changes, mostly in response to changes in New Jersey Department of Education (NJDOE) requirements. First, the program sequence has undergone revision, which impacted the entering freshman class beginning in year 2017. The changes included the addition of two courses to replace a course that covered both Special Education and Content Literacy. The new courses are a full unit (4 credits) course in Special Education (SPE 103) and a ½-unit (2 credits) course in Reading in Secondary Education (RAL 328). The program also no longer includes EFN 398 *Historical and Political Context of Schools*, although it is now a liberal learning course and it is recommended that our teacher candidates take it if they can.

The second set of changes in our program includes sequential Clinical Practice experiences to meet the required NJDOE one-year student teaching experience and an increase in the number of units in SED 399 (*Pedagogy in Secondary Classrooms)* from 1 unit to 1.5 units (6 credits) to reflect the increase in practicum from 100 to 150 hours. This course is part of the Clinical Practice I experience and the state now requires 150 hours in the field during that first practicum. Also in response to changes from the NJDOE, satisfactory scores on the Praxis Core are required to enroll in Clinical 1 and a 3.0 GPA at the conclusion of Clinical Practice I is required to move forward in the program to Clinical Practice II.

The third change was the adoption of edTPA in the student teaching capstone. The NJDOE required performance-based assessment replaced our former impact on student learning project. Adoption of edTPA required the secondary education program to substantially revise the curriculum of the capstone course and the

exit portfolio assignment that all students are required to present before faculty at the end of student teaching.

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 INCLUDING SPACES)**

During their sophomore year candidates observe a teacher for 25 hours in **EFN 299, Schools and Communities,** to complete a Classroom Culture Portfolio in which they analyze the classroom climate of their placement in three domains: teacher leadership, social emotional climate, and effectiveness of teacher communication. In **SED 224, Adolescent Learning and Development**, they tutor in an after school program in a local school district or in the TCNJ CCS program which provides a college like experience for college age students with cognitive impairments, again for 25 hours. In **Clinical Practice I**, taken in the fall semester of the senior year, candidates enroll concurrently in **SED 399, Pedagogy in the Secondary Schools**, **MTT 390, Methods of Teaching Mathematics II**, and **RAL 328, Reading in Secondary Education: Supporting Adolescent Literacies.** During their 150+ hours in the field and coursework, they plan a two-week curriculum unit replete with support materials and assessments and implement subject area content knowledge and pedagogical knowledge using a variety of appropriate instructional and assessment strategies. In the subsequent semester, candidates complete a one-semester (14 weeks, approximately 450 hours) full-time student teaching experience, designated as the 2-unit course **MTT 490, Clinical Practice II**. They are in the classroom every day for the whole day assuming all of the duties of the cooperating teacher. This clinical experience is supervised by college faculty who have secondary mathematics teaching experience.

Through this sequence of placements in the field, candidates experience a diverse range of settings, including urban and non-urban, as well as both middle schools and high schools. The College of New Jersey places teacher candidates with cooperating teachers from various districts within New Jersey and Pennsylvania.
Our cooperating teachers are required to be:
• highly qualified in their discipline,
• tenured,
• experienced and certified in the subject area of their field of teaching,
• assigned by their principal or subject supervisor to mentor prospective educators,
• able to play a vital role in TCNJ's professional education programs,
• familiar with the expectations of TCNJ's Dispositions Rubric and Mathematics Lesson Observation Rubric,
• willing to work in consultation and collaboration with TCNJ's supervisor(s), and
• able to provide invaluable direction to the activities, methods, and techniques developed and implemented by the teacher candidate.

3. **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.) For post baccalaureate or master's programs include a graduate advising form or transcript analysis form showing undergraduate mathematics content course requirements aligned to *NCTM Mathematics Content for Secondary.***

A LINK to upload or manage your uploaded file(s)
Create file for upload.

4. **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.**

A LINK to upload or manage your uploaded file(s)
Create file for upload.

5. 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. 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.

Academic Year	No. of Candidates enrolled	No. of Completers
2018-2019	94	20
2017-2018	102	21
2016-2017	101	23

(2) CAEP 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.

6. Faculty Information

Directions: Complete the following information for each faculty member responsible for professional coursework, clinical supervision, or administration in this program.

See attached spreadsheet "Faculty info" **Faculty Member Name**	
Highest Degree, Field, & University(3)	
Assignment: Indicate the role of the faculty member(4)	
Faculty Rank(5)	
Tenure Track	☐ YES
Scholarship(6), Leadership in Professional Associations, and Service(7):List up to 3 major contributions in the past 3 years(8)	
Teaching or other professional experience in P-12 schools(9)	

(3) For example, PhD in Curriculum & Instruction, University of Nebraska.
(4) For example, faculty, clinical supervisor, department chair, administrator
(5) For example, professor, associate professor, assistant professor, adjunct professor, instructor
(6) Scholarship is defined by CAEP as a 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.
(7) 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.

(8) For example, officer of a state or national association, article published in a specific journal, and an evaluation of a local school program.

(9) Briefly describe the nature of recent experience in P-12 schools (e.g. clinical supervision, in-service 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

In this section, list the 6-8 assessments that are being submitted as evidence for meeting the NCTM 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.

1. Please provide following assessment information (Response limited to 250 characters each field)

pe and Number of Assessment	Name or Assessment (10)	Type or Form or Assessment (11)	When the Assessment Is Administered (12)
Assessment #1: Licensure assessment, or other content-based assessment aligned to *NCTM Mathematics Content for Secondary* (required)	Praxis II	Licensure assessment	Junior or senior year
Assessment #2: Content knowledge in secondary mathematics aligned to *NCTM Mathematics Content for Secondary* (required)	Course grades	Course grades	MAT 200 – freshmen year MAT 205, MAT 229, MAT 255, MAT 301, and STA 216 – sophomore year MAT 305, MAT 351 – junior year
Assessment #3: Candidate ability to plan instruction (required)	Mathematics Unit and Lesson plan	Project	MTT 390: Methods of Teaching Mathematics II, during Clinical I, senior year
Assessment #4: Student teaching (required)	Mathematics Teaching Performance Assessment	Field observation	MTT 490: Clinical Practice II, senior year
Assessment #5: Candidate effect on student leaning (required)	edTPA	Performance-based assessment portfolio	MTT 490: Clinical Practice II, senior year
Assessment #6: Content knowledge in secondary mathematics aligned to NCTM Mathematics Content for Secondary (required)	MAT 255 presentation	Project/presentation	MAT 255: Perspectives on the Development of Mathematics – sophomore year
Assessment #7: Additional assessment that addresses NCTM standards (optional)			
Assessment #8: Additional assessment that addresses NCTM standards (optional)			

(11) Identify assessment by title used in the program; refer to Section IV for further information on appropriate assessment to include.

(12) Identify the type of assessment (e.g., essay, case study, project, comprehensive exam, reflection, state licensure test, portfolio).

(13) 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).

SECTION III - RELATIONSHIP OF ASSESSMENT TO STANDARDS

1. Standard 1: Content Knowledge

	#1	#2	#3	#4	#5	#6	#7	#8
Effective teachers of secondary mathematics demonstrate and apply knowledge of major mathematics concepts, algorithms, procedures, connections, and applications within and among mathematical content domains.								
Preservice teacher candidates: 1a) Demonstrate and apply knowledge of major mathematics concepts, algorithms, procedures, applications in varied contexts, and connections within and among mathematical domains (Number, Algebra, Geometry, Trigonometry, Statistics, Probability, Calculus, and Discrete Mathematics) as outlined in the *NCTM Mathematics Content for Secondary.*	x	x				x		

2. Standard 2: Mathematical Practices

	#1	#2	#3	#4	#5	#6	#7	#8
Effective teachers of secondary mathematics solve problems, represent mathematical ideas, reason, prove, use mathematical models, attend to precision, identify elements of structure, generalize, engage in mathematical communication, and make connections as essential mathematical practices. They understand that these practices intersect with mathematical content and that understanding relies on the ability to demonstrate these practices within and among mathematical domains and in their teaching.								
Preservice teacher candidates: 2a) Use problem solving to develop conceptual understanding, make sense of a wide variety of problems and persevere in solving them, apply and adapt a variety of strategies in solving problems confronted within the field of mathematics and other contexts, and formulate and test conjectures in order to frame generalizations.		**x**		**x**				
2b) Reason abstractly, reflectively, and quantitatively with attention to units, constructing viable arguments and proofs, and critiquing the reasoning of others; represent and model generalizations using mathematics; recognize structure and express regularity in patterns of mathematical reasoning; use multiple representations to model and describe mathematics; and utilize appropriate mathematical vocabulary and symbols to communicate mathematical ideas to others.		x		x				
2c) Formulate, represent, analyze, and interpret mathematical models derived from real-world contexts or mathematical problems.								
2d) Organize mathematical thinking and use the language of mathematics to express ideas precisely, both orally and in writing to multiple audiences.				X		X		
2e) Demonstrate the interconnectedness of mathematical ideas and how they build on one another and recognize and apply mathematical connections among mathematical ideas and across various content areas and real-world contexts.				x		x		
2f) Model how the development of mathematical understanding within and among mathematical domains intersects with the mathematical practices of problem solving, reasoning, communicating, connecting, and representing.								

3. Standard 3: Content Pedagogy

	#1	#2	#3	#4	#5	#6	#7	#8
Effective teachers of secondary mathematics apply knowledge of curriculum standards for mathematics and their relationship to student learning within and across mathematical domains. They incorporate research-based mathematical experiences and include multiple instructional strategies and mathematics-specific technological tools in their teaching to develop all students' mathematical understanding and proficiency. They provide students with opportunities to do mathematics – talking about it and connecting it to both theoretical and real-world contexts. They plan, select, implement, interpret, and use formative and summative assessments for monitoring student learning, measuring student mathematical understanding, and informing practice.								
Preservice teacher candidates:								

3a) Apply knowledge of curriculum standards for secondary mathematics and their relationship to student learning within and across mathematical domains.			**x**	**x**					
3b) Analyze and consider research in planning for and leading students in rich mathematical learning experiences.			x	x	X				
3c) Plan lessons and units that incorporate a variety of strategies, differentiated instruction for diverse populations, and mathematics-specific and instructional technologies in building all students' conceptual understanding and procedural proficiency.			x	x	X				
3d) Provide students with opportunities to communicate about mathematics and make connections among mathematics, other content areas, everyday life, and the workplace.			x		X				
3e) Implement techniques related to student engagement and communication including selecting high quality tasks, guiding mathematical discussions, identifying key mathematical ideas, identifying and addressing student misconceptions, and employing a range of questioning strategies.			x	X	X				
x 3f) Plan, select, implement, interpret, and use formative and summative assessments to inform instruction by reflecting on mathematical proficiencies essential for all students.			x	x	X				
3g) Monitor students' progress, make instructional decisions, and measure students' mathematical understanding and ability using formative and summative assessments.					x				
Standard 4: Mathematical Learning Environment	#1	#2	#3	#4	#5	#6	#7	#8	
4. **Effective teachers of secondary mathematics exhibit knowledge of adolescent learning, development, and behavior. They use this knowledge to plan and create sequential learning opportunities grounded in mathematics education research where students are actively engaged in the mathematics they are learning and building from prior knowledge and skills. They demonstrate a positive disposition toward mathematical practices and learning, include culturally relevant perspectives in teaching, and demonstrate equitable and ethical treatment of and high expectations for all students. They use instructional tools such as manipulatives, digital tools, and virtual resources to enhance learning while recognizing the possible limitations of such tools.**									
Preservice teacher candidates:									
4a) Exhibit knowledge of adolescent learning, development, and behavior and demonstrate a positive disposition toward mathematical processes and learning.				**x**					
4b) Plan and create developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences.			X		X				
4c) Incorporate knowledge of individual differences and the cultural and language diversity that exists within classrooms and include culturally relevant perspectives as a means to motivate and engage students.									
4d) Demonstrate equitable and ethical treatment of and high expectations for all students.			X	X					
4e) Apply mathematical content and pedagogical knowledge to select and use instructional tools such as manipulatives and physical models, drawings, virtual environments, spreadsheets, presentation tools, and mathematics-specific technologies (e.g., graphing tools, interactive geometry software, computer algebra systems, and statistical packages); and make sound decisions about when such tools enhance teaching and learning, recognizing both the insights to be gained and possible limitations of such tools.			x	x					
Standard 5: Impact on Student Learning	#1	#2	#3	#4	#5	#6	#7	#8	
5. **Effective teachers of secondary mathematics provide evidence demonstrating that as a result of their instruction, secondary students' conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and application of major mathematics concepts in varied contexts have increased. These teachers support the continual development of a productive disposition toward mathematics. They show that new student mathematical knowledge has been created as a consequence of their ability to engage students in mathematical experiences that are developmentally appropriate, require active engagement, and include mathematics-specific technology in building new knowledge.**									
Preservice teacher candidates:									
5a) Verify that secondary students demonstrate conceptual understanding; procedural fluency; the ability to formulate, represent, and solve problems; logical reasoning and continuous reflection on that reasoning; productive disposition toward mathematics; and the application of mathematics in a variety of contexts within major mathematical domains.					X				
5b) Engage students in developmentally appropriate mathematical activities and investigations that require active engagement and include mathematics-specific technology in building new knowledge.				X					
5c) Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence and determine the extent to which students' mathematical proficiencies have increased as a result of their instruction.				x	x				
Standard 6: Professional Knowledge and Skills	#1	#2	#3	#4	#5	#6	#7	#8	
6. **Effective teachers of secondary mathematics are lifelong learners and recognize that learning is often collaborative. They participate in professional development experiences specific to mathematics and mathematics education, draw upon mathematics education**									

7.	**research to inform practice, continuously reflect on their practice, and utilize resources from professional mathematics organizations.** Preservice teacher candidates: 6a) Take an active role in their professional growth by participating in professional development experiences that directly relate to the learning and teaching of mathematics. 6b) Engage in continuous and collaborative learning that draws upon research in mathematics education to inform practice; enhance learning opportunities for all students' mathematical knowledge development; involve colleagues, other school professionals, families, and various stakeholders; and advance their development as a reflective practitioner. 6c) Utilize resources from professional mathematics education organizations such as print, digital, and virtual resources/collections.			X x	X x				

tandard 7: Secondary Mathematics Field Experiences and Clinical Practice

	#1	#2	#3	#4	#5	#6	#7	#8
Effective teachers of secondary mathematics engage in a planned sequence of field experiences and clinical practice under the supervision of experienced and highly qualified mathematics teachers. They develop a broad experiential base of knowledge, skills, effective approaches to mathematics teaching and learning, and professional behaviors across both middle and high school settings that involve a diverse range and varied groupings of students. Candidates experience a full-time student teaching/internship in secondary mathematics directed by university or college faculty with secondary mathematics teaching experience or equivalent knowledge base. Preservice teacher candidates: 7a) Engage in a sequence of planned field experiences and clinical practice prior to a full-time student teaching/internship experience that include observing and participating in both middle and high school mathematics classrooms and working with a diverse range of students individually, in small groups, and in large class settings under the supervision of experienced and highly qualified mathematics teachers in varied settings that reflect cultural, ethnic, linguistic, gender, and learning differences. 7b) Experience full-time student teaching/internship in secondary mathematics that is supervised by a highly qualified mathematics teacher and a university or college supervisor with secondary mathematics teaching experience or equivalent knowledge base. 7c) Develop knowledge, skills, and professional behaviors across both middle and high school settings; examine the nature of mathematics, how mathematics should be taught, and how students learn mathematics; and observe and analyze a range of approaches to mathematics teaching and learning, focusing on tasks, discourse, environment, and assessment.			x	x				

SECTION IV - EVIDENCE FOR MEETING STANDARDS

YOU CAN UTILIZE THE ASSESSMENT FILE TEMPLATE THAT I CREATED FOR EACH OF YOUR ASSESSMENTS.

DIRECTIONS: The 6-8 key assessments listed in Section II must be documented and discussed in Section IV. Taken as a whole, the assessments must demonstrate candidate mastery of the SPA standards. The key assessments should be required of all candidates. Assessments, scoring guides/rubrics and data charts 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/rubrics to the same depth, breadth, and specificity as in the SPA standards. Data tables should also be aligned with the SPA standards. The data should be presented, in general, at the same level it is collected. For example, if a rubric collects data on 10 elements [each relating to specific SPA standard(s)], then the data chart should report the data on each of the elements rather that reporting a cumulative score.

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 to be aligned with the elements in CAEP Standard 1:

- **Content knowledge (Assessments 1, 2 and 6)**
- **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 one document that includes the following items:

(1) A two-page narrative that includes the following:
a. A brief description of the assessment and its use in the program (one sentence may be sufficient);
b. 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.
c. A brief analysis of the data findings;
d. An interpretation of how that data provide evidence for meeting standards, indicating the specific SPA standards by number, title, and/or standard wording;
and

(2) Assessment Documentation
e. The assessment tool itself or a rich description of the assessment (often the directions given to candidates);
f. The scoring guide/rubric for the assessment; and
g. Charts that provide candidate data derived from the assessment.

The responses for e, f, and g (above) should be limited to the equivalent of five text pages each, however in some cases assessment instruments or scoring guides/rubrics may go beyond five pages.

Note: As much as possible, combine all of the files for one assessment into a single file. That is, create one file for Assessment #4 that includes the two-page narrative (items a – d above), the assessment itself (item e above), the scoring guide (item f above), and the data chart (item g above). Each attachment should be no larger than 2 mb. Do not include candidate work or syllabi. There is a limit of 20 attachments for the entire report so it is crucial that you combine files as much as possible.

1. **State licensure test(s) or professional examinations of content knowledge. NCTM standards addressed in this entry could include Standards 1-2. If your state does not require licensure tests or professional examinations in the content area, data from another assessment aligned to NCTM Mathematics Content for Secondary must be presented to document candidate attainment of content knowledge. (Assessment Required)**

   Provide assessment information as outlined in the directions for Section IV

   A LINK to upload or manage your uploaded file(s)

2. **Assessment of content knowledge in mathematics. NCTM standards addressed in this assessment that is aligned to NCTM Mathematics Content for Secondary could include but are not limited to Standards 1-2. Examples of assessments include comprehensive examinations, GPAs or grades, and portfolio tasks(13). For post- baccalaureate teacher preparation, include an assessment used to determine that candidates have adequate content backgroud in the subject to be taught. (Assessment Required)**

   Provide assessment information as outlined in the directions for Section IV

   A LINK to upload or manage your uploaded file(s)

(14) For program review purposes, there are two ways to list a portfolio as an assessment. In some programs a portfolio is considered a single assessment and scoring criteria (usually rubrics) have been developed for the contents of the portfolio as a whole. In this instance, the portfolio would be considered a single assessment. However, in many programs a portfolio is a collection of candidate work—and the artifacts included.

(15)

3. **Assessment that demonstrates candidates can effectively plan classroom-based instruction. NCTM standards that could be addressed in this assessment include but are not limited to Standard 3. Examples of assessments include the evaluation of candidates' abilities to develop leasson or unit plans, individualized educational plans, needs assessments, or intervention plans. (Assessment Required)**

   Provide assessment information as outlined in the directions for Section IV

   A LINK to upload or manage your uploaded file(s)

4. **Assessment that demonstrates candidates' knowledge, skills, and dispositions are applied effectively in practice. NCTM standards that could be addressed in this assessment include but are not limited to Standards 3, 4, 6, and 7. An assessment instrument used in student teaching or an internship should be submitted. (Assessment Required)**

   Provide assessment information as outlined in the directions for Section IV

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5. **Assessment that demonstrates candidate effect on student learning. NCTM standards that could be addressed in this assessment include but are not limited to Standard 5. Examples of assessments include those based on student work samples, portfolio tasks, case studies, follow-up studies, and employer surveys. (Assessment Required)**

   Provide assessment information as outlined in the directions for Section IV

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6. **Assessment of content knowledge in mathematics. NCTM standards addressed in this assessment that is aligned to NCTM CAEP Mathematics Content for Secondary could include but are not limited to Standards 1-2. Examples of assessments include comprehensive examinations, GPAs or grades, and portfolio tasks.**

   Provide assessment information as outlined in the directions for Section IV

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7. **Additional assessment that addresses NCTM standards. Examples of assessments include evaluations of field experiences, case studies, portfolio tasks, licensure tests not reported in #1, and follow-up studies. (Optional)**

   Provide assessment information as outlined in the directions for Section IV

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8. **Additional assessment that addresses NCTM standards. Examples of assessments include evaluations of field experiences, case studies, portfolio tasks, licensure tests not reported in #1, and follow-up studies. (Optional)**

   Provide assessment information as outlined in the directions for Section IV

   A LINK to upload or manage your uploaded file(s)

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 have taken to use information from assessments for improvement of both candidate performance and the program. This information should be organized around (1) content knowledge, (2) professional and pedagogical knowledge, skill, and dispositions, and (3) student learning.**

   (Response limited to 12,000 characters INCLUDING SPACES)

Content Knowledge: Historically, our students have fared extremely well on the Praxis II Exam. Based on reported data, this trend has continued in 2016-17 and 2017-18 with 100% of the program completers passing the exam. Although some of the NCTM indicators are not addressed in the Praxis exam, we believe that our passing rate demonstrates that our students do have a strong content knowledge base. In addition, no less than 94% of the program completers have met the minimum expectation in each of the courses for which we collected data (MAT 200, MAT 205, MAT 229, MAT 255, MAT 301, MAT 305, MAT 351, and STA 216) and for all but one of the courses in one year, 100% of the completers met our expectations. It also appears that the large majority of our candidates are able to demonstrate proficiency for each of the domain competencies that relate to the history of mathematics. They are also all able to organize their mathematical thinking and use the language of mathematics to express ideas precisely in their presentations and almost all candidates were successful in demonstrating the interconnectedness of mathematical ideas and making connections to real world contexts. Without a doubt, our program completers have strong content knowledge.

In compiling this report, we noticed that our coursework is not aligned with some of the NCTM indicators that are more closely related to secondary school content; for example, indicators A.2.1 through A.2.4. Also, candidates often state on exit interviews that they don't understand why they have to take some of the upper level math classes in order to teach middle or high school (Abstract Algebra for instance). In order to align with the NCTM indicators and to meet recommendations from the Conference Board of Mathematical Science's *Mathematical Education of Teachers* documents, we created MAT 497, Topics in Secondary Mathematics from an Advanced Viewpoint. While some candidates have been taking it as an option since 2015, it will be a required course for all Mathematics Secondary Education seniors as of the fall of 2020. This course will help students make connections between the college coursework required for the major and secondary school mathematics content. This course will be aligned with more of the NCTM indicators that are not currently addressed in our required courses.

Although we still have 100% of our candidates passing the Praxis II exam by the time they complete the program, we are noticing an increase in the number of candidates who have to take it a second or even third time in order to pass. This seems to be directly related to the change in the exam that occurred in 2013. Our Council of Student Teachers of Mathematics has recently started offering study sessions for the Praxis II exam. We are also thinking about ways we might incorporate test preparation into the program.

Professional and Pedagogical Knowledge, Skills and Dispositions:
One of the strengths of the Mathematics Secondary Education program is the collaboration between faculty in the departments of Mathematics and Statistics and Educational Administration and Secondary Education. Their interdisciplinary and on-going collaboration around course content, field work, and mutually shared assignments has significantly improved candidates' lesson planning, unit construction and teaching performance. Additionally, Mathematics Secondary Education students at TCNJ benefit from their required two methods courses in the Department of Mathematics and Statistics.

The data from Assessment 3, the Mathematics Unit and Lesson Plan, that is administered in Clinical Practice I, shows that an area of weakness may be in domain competency 3f) "Plan, select, implement, interpret, and use formative and summative assessments to inform instruction…" The data from Assessment 4, the Teaching Performance Assessment, that is administered in Clinical Practice II, seems to point to the same competency weakness in that the category of "Closure" (also aligned with 3f) is one of the weakest areas. Therefore, we have added an "Assessment Project" to MTT 390, Methods of Teaching Mathematics II, which students take during Clinical Practice I. This project will involve designing, administering, and analyzing student data from an assessment that will be included in the unit plan. We have also incorporated more focus on assessment and closure in SED 498, Collaborative Capstone for Professional Inquiry, which is taken during Clinical Practice II. We hope that by adding this additional focus on assessment during Clinical Practice I and II, candidates will perform better on domain competency 3f and be more prepared to implement assessments in their future classrooms.

Student Learning:
We have spent much time over the last few years on thinking about how to support candidates to complete the newly required edTPA performance-based assessment (Assessment 5). Since 2017-18 was the first year of implementation, the data from Assessment 5 will help us with our planning for improvement. Although there is no passing score until this coming academic year, we are pleased that our candidates' mean score is on par with the national mean and higher than the state mean.

Ironically, this initial data from Assessment 5 shows that the candidates performed much better in domain competency 3f in the edTPA portfolio than they did in Assessments 3 and 4, since performance on Rubric 5 (Planning assessments) had the highest mean scores of the rubrics that are aligned to NCTM domain competencies. However, the data also shows that the weakest area is Rubric 13 (Student Use of Feedback), which is aligned with domain competency 5c) "Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence and determine the extent to which students' mathematical proficiencies

have increased as a result of their instruction." The "Assessment Project" added to MTT 390 that is mentioned above is also designed to address this weakness. After administering their assessment as part of the unit plan, candidates will analyze and reflect on the data. They will choose focus students to represent the patterns of learning they see in the data and plan the next steps they would take with those students. We hope that with this additional opportunity to analyze assessment data, they will perform better in the future on the edTPA portfolio assessment.

1. **For Revised Reports: Describe what changes or additions have been made to address the standards that were not met in the original submission. Provide new responses to questions and/or new documents to verify the changes described in this section. Specific instructions for preparing a Revised Report are available on the CAEP website at http://caepnet.org/accreditation/caep-accreditation/spa-program-review-policies-and-procedur**

   For Response to Conditions Reports: Describe what changes or additions have been made to address the conditions cited in the original recognition report. Provide new responses to questions and/or new documents to verify the changes described in this section. Specific instructions for preparing a Response to Conditions Report are available on the CAEP website at http://caepnet.org/accreditation/caep-accreditation/spa-program-review- policies-and-procedur

   (Response limited to 24,000 characters. INCLUDING SPACES)

Please click "Next"

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

Course Descriptions (of required courses used for Assessment 2)

200-Level Courses

MAT 200/Proof Writing through Discrete Mathematics
1 course unit
(every semester)
Prerequisite: MAT 127
The course will cover the following specific topics: mathematical notation, logic, truth tables, direct proofs, indirect proofs, proof by contradiction, proof by cases, mathematical induction (weak and strong), contrapositive proofs, definitions and properties of functions and relations, cardinality, proofs of one-to-one and onto properties, proofs of set equality, and an introduction to graph theory. In addition to teaching logic, functions, and relations, instructors will teach proof with examples taken from three to four areas of discrete mathematics including set theory, number theory, sequences and recursion, and a fourth area at the discretion of the instructor. However, the main goal of the course is student mastery of proof techniques and not an exhaustive coverage of topics from discrete mathematics.

MAT 205/Linear Algebra: Theory and Applications
1 course unit
(every semester)
Prerequisite: MAT 128 or MAT 200 or CSC 270
An introduction to vector spaces and systems of linear equations essential for the understanding of both pure and applied mathematics. Selected topics include: systems of linear equations, matrices, linear transformations, linear independence, determinants, vector spaces, eigenvalues and eigenvectors, and orthogonality. This course includes a lab component. In this lab, students will learn to use computer software tools such as MATLAB as an aid to solving problems. The use of a computer enables students to tackle more difficult, but more realistic, problems than otherwise possible.

MAT 229/Multivariable Calculus
1 course unit
(every semester)
Prerequisite: MAT 128
Topics include: geometry of three dimensional space, vector functions, derivatives of functions of several variables, integrals in dimension two and three, and Stokes' theorem.

MAT 255/Perspectives on the Development of Mathematics
1 course unit
(every spring)
Prerequisite: Reserved for math education students
The course develops a skeletal outline of the history of mathematics. Additional topics may include the history of a specific area of mathematics. Samples of topics that may be covered in the course are: ancient mathematics, the relation between Greek and Mesopotamian algebra, the

growth of trigonometric ideas, the geometric solution of the cubic equations by Omar Khayyam and the algebraic solutions by Cardano, Zeno's paradox and the development of different number systems.

STA 216/Statistical Inference & Probability
1 course unit
(every fall)
Prerequisite: MAT 127
This course introduces future mathematics educators to statistical ideas and concepts with an emphasis on methods of statistical inference (notably confidence intervals and hypothesis tests), sampling methods and surveys, and probability (notably conditional probability, the binomial distribution, and concepts relating to independence and disjoint probabilities).

300-Level Courses

MAT 301/Number Theory
1 course unit
(every semester)
Prerequisite: MAT 200
Topics include divisibility, primes, unique factorization, diophantine equations, congruences, quadratic reciprocity, and such optional topics as sums of squares, number-theoretic functions, continued fractions, prime number theory, public-key encryption, and elliptic curves. This course includes a weekly lab component where we will be writing and executing cryptographic computer algorithms using the modular arithmetic techniques studied in lecture.

MAT 305/Abstract Algebra
1 course unit
(every semester)
Prerequisites: MAT 200 and MAT 205
An introduction to groups, rings, integral domains and fields. Additional topics include groups of symmetries, rings of integers, rings of polynomials and construction of the field of rational numbers.

MAT 351/Geometry
1 course unit
(every semester)
Prerequisites: MAT 200 and MAT 229
Both Euclidean and non-Euclidean geometries are studied. Each geometry will be understood from three different perspectives: first, as the collection of theorems following from a particular set of axioms; second, as the two-dimensional geometry arising from a particular metric; and third, as the geometry obtained from a set together with a specific group of rigid motions of the set. At least one of these viewpoints will be developed in detail.

Mathematics Secondary Education Faculty

FacultyMemName	HighestDegree	Assignment	Rank	TenureTrack	Scholarship, Leadership in Professional Associations, and Service:List up to 3 major contributions in the past 3	P12Experience
Bellino, Marissa	Ph.D., Urban Education	Faculty	Assistant Professor	Yes	Burroughs, G., Bellino, M.E., Johnston, M., Ribeira, C., Chanin, M., Cash, B., and Cahill, E. (2019). Pushing the Boundaries of Elementary Social Studies Education: Teaching Young Children about Borders and Freedom. Teaching Social Studies Published by the New York and New Jersey State Councils for the Social Studies, 19 (1), 19-24. Bellino, M.E., Richards, A.J., Chessler, M., Madden, L., Magee, N. (April, 2019). Recruiting Future Physics Teachers Through Field-Based Summer Enrichment Program. In Rinke, C.R. and L.K. Mawhinney (Eds.), Opportunities and Challenges in Teacher Recruitment and Retention. Information Age Publishing. Bellino, M. E., & Adams, J. D. (2017). A critical urban environmental pedagogy: Relevant urban environmental education for and by youth. The Journal of Environmental Education, 48(4), 270-284.	HS Science Teacher - High School for Environmental Studies (2003-2014)
Connolly, Maureen	Ed.D, Instructional Leadership	Faculty, Program Coordinator	Associate Professeor	Yes	Board Member NJASCD Connolly, M. & Giouroukakis, V. (2016) Achieving next generation literacy: Using the tests you think you hate to help the students you love. Alexandria, VA: ASCD.	
Cunningham, Robert	Ed.D., Math Education, Temple University	Faculty, Clinical Supervisor	Professor	Yes	1. Awarded Fulbright Core Grant (2019-2020) in Mathematics Education at St. Vincent and the Grenadines Community College by the J. William Fulbrigt Foreign Scholarship Board. 2. Journal article: Cunningham, R.F. & Clooney, S. (2017). Preservice and In-Service Mathematics Teachers' Perspectives of High-Quality Mathematics Instruction. *Issues in the Undergraduate Mathematical Preparation of School Teachers: The Journal,* Vol.2 (Pedagogy). 3. Journal article:Cunningham, R.F. & Rappa, A. (2016). Survey of Mathematics Teachers' Static and Transformational Performance and Perspectives for Teaching Similarity. *European Journl of Science and Mathematics Education,* 4, 4, 440-446.	Served as mathematics supervisor for student teachers in middle school and high school.
Davis, Jonathan	Ph.D, Sociology	Faculty, Program Coordinator	Assistant Professor	Yes	Davis, J.R. & Girard, B. (2018) Power: Complicating How the Term Power is used in the Social Studies Classroom. Teaching Social Studies, 18(1), 10-16. Mannion, C. & Davis, J.R. (2018). (Un)Knowingly Made for the Middle: Why Teacher Candidates Decide to Teach in Middle Schools. Current Issues in Middle Level Education, 23(1), 1-21. Davis, J.R. (2017). Classroom Management in Teacher Education Programs. Palgrave Macmillan: New York.	HS Social Studies Teacher - Lloyd Memorial HS, KY (2005-8); HS Social Studies Teacher & Department Chair - Urban Assembly School of Design and Construction, NYC (2008-11); HS Social Studies Teacher and Instructional Coach, Eagle
DiStasi, Joanna	MA, Secondary Math Education, Glassboro (	Clinical Supervisor	Adjunct	No	Former Mathematics Department Supervisor at Lindenwold School District; Former Adjunct professor at Camden County Community College	
Donahue, Judith	M.Ed Reading Specialist, TCNJ	Faculty, Clinical Supervisor	Adjunct	No	Permanent member - NJDOE Language Arts Literacy Committee - Roseanne Harris Author - USDOE - Teaching American History Grant Director Language Arts Literacy/Humanities - Piscataway Township School District - retired, as such, registered Professional development Service provider, NJDOE; numerous PD presentations on brain-based learning	Bound Brook High School, Bound Brook, NJ Colts Neck High School - FRHSD, Colts Neck, NJ Supervisor of English -Colts Neck High School, Colts Neck, NJ Director of Language Arts Literacy/Humanities -
Fesko, Marilyn	B.A., Math, Hollins University	Clinical Supervisor	Adjunct	No	Instructor/substitute Alternate Route Certification Program-TCNJ and East Brunswick; Adopt-A-Park program between Mercer County and Fisher Middle School; Omega Team Leader.	Clinical Supervisor Secondary Education 2004-2019; Fisher Middle School Math Teacher 1970-2004; team leader 1980-2004; New Jersey Secondary Math Teacher s Certificate Highly Qualified.

Girard, Brian	Ph.D., Educational Studies, University of Mic	Faculty, Department Chair	Associate Professor	Yes	Harris, L.M. & Girard, B. (in press). Evaluating the support of teacher choice in state history standards. The History Teacher. Girard, B. & Harris, L.M. (2018). Global and world history education. In S. Metzger & L.M. Harris (Eds.), International handbook of history teaching and learning (pp. 253-289). Hoboken, NJ: Wiley. Girard, B. (2018). Developing interpersonal and curricular dimensions of simulations: Lessons from a Sophomore civics classroom In C. Wright-Maley (Ed.), More like life	Taught Junior High School English and Social Studies for 5 years.
Gordon, Karen	Highest Degree Awarded, field and Universit	Highest Degree Awarded, field and University BA (	Assistant Professor	No	US Dept. of Education/Office of Safe and Drug Free Schools grant reviewer for elementary education and secondary education, substance use prevention; Healthy Campus Coalition/Healthy Campus 2020 (based on USDHHS Healthy People 2020-Committee to rewrite national post-secondary objectives and framework manual (Am. College Health Association)& Assessment Committee; Central New Jersey inter college regional information and support for high school college applicants; Princeton Regional Schools-special sports volunteer; Council on Undergraduate Research, 14th CUR Biennial Conference-June 2012- Poster session; NJDOE Promoting Adolescent Health through School- Based HIV/STD Prevention and School-Based Surveillance, DASH-CDC (PS13-1308)-Principle Investigator for evaluation of grant-funded	Supervision of pre-student teachers in middle (6-8) and high schools (9-12), supervision of student teachers in high schools in New Jersey-19 years supervising student teachers in Global Student Teacher program
Gosselin, Colette	Ed.D, Social and Philosophical Foundations	Faculty, Clinical Supervisor	Associate Professor	Yes	Khalil, D., Hughes, G., Gosselin, C., & Edwards, L. (2016). TeachLive™ Rehearsals: One HBCU's study on Prospective Teachers' Reformed Instructional Practices and their Mathematical Affect. In Wood, M., Turner, E., and Civil, M. (Eds.). Proceedings of the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Tucson, AZ: University of Arizona Gosselin, C. & Meixner, E. (2015). "Blank Canvas and Glass Ceiling: Using Visual Metaphors and Narratives to Examine Pre-service Teacher Development." Multicultural Perspective. This manuscript analyzes visual metaphors produced by TCNJ students in EFN 299 Schools, Communities, and Culture through a framework of three models of college student development.	New York State Certification in Biology, Chemistry and General Science; 7 years (7-12) teaching experience.
Liebars, Cathy	Ph.D. in Mathematics, Lehigh University	Faculty, Clinical supervisor, Program Coordinator	Associate Professor	Yes	1. Liebars, C., Sub-contract awardee, Developing Preservice Elementary Teachers' Ability to Facilitate Goal-Oriented Discussions in Science and Mathematics Via the Use of Simulated Classroom Interactions, ETS NSF DRK-12 grant.(2018-19) 2. Beyers, J. and Liebars, C., Co-directors, Woodrow Wilson Teaching Fellowship grant, awarded to TCNJ (2013 – 2021). 3. Association of Mathematics Teacher Educators program committee (2017 - 2020)	Served as mathematics supervisor for student teachers in middle school and high school. Conducted numerous professional development workshops and courses focused on mathematics
Maskell, Jeanne	MA, Education, Ball State University	Clinical Supervisor	Adjunct	No	1. Communications Director, Association of Mathematics Teachers of New Jersey	Mathematics supervisor for student teachers in middle and high school. Conducted numerous professional development workshops and courses focused on content and curricula for K-8 teachers in
Niemis, Stephanie	MA, Education, The College of New Jersey	Clinical Supervisor	Adjunct	No	Winsight Math Committee member, ETS Teacher Educator Focus Group	Junior High School math teacher, Elementary Math Specialist, College adjuct professor, Clinical Supervisor
Palmer, Ruth J.	Ph.D (1988), Educational Psychology. Howa	Faculty	Associate Professor	Yes	Scholarship, Leadership in Professional Associations, and Service :List up to 3 major contributions in the past 3 years: 1. Book Contract, Kendall Hunt Publishing Company2012 2. Councilor, At-Large Committee (2012-2015) Council on Undergraduate Research 3. Vice President, School Board (2009 -2012) Ewing Township Schools	1. Designer: Research Apprenticeship Practicum 2010 2. Board Representative to Teacher Evaluation Committee, Ewing Township Schools. 3. Partners in Teaching and Learning: An After-School
Peel, Anne	Ed.D in Literacy, Department of Teaching an	Faculty	Associate Professor	yes	Recent publications in English Journal, Journal of Adolescent & Adult Literacy, Literacy Journal; recent peer-reviewed presentations at NCTE Annual Conference, LRA, Annual Conference, ILA Annual Conference	2004-2012 English Teacher, Burlington Township High School, Burlington Township, NJ. 2002 -2004 English Cluster Leader and English Teacher, World Communications Charter School,

Snider, Rachel	Ph.D. in Educational Studies, with a specializ	Faculty, Clinical Supervisor	Assistant Professor	Yes	1. Creager, M., Parrish, C., & Snider, R. (2019, February) Learning to Launch: Growing as New Teacher Educators through Collaborative Unit Design in Secondary Methods. Presentation at the Association of Mathematics Teacher Educators Annual Conference; Orlando, FL. 2. Snider, R. (2018, February) Selecting Examples: Preservice and Inservice Teacher Knowledge and Practice. Poster presentation at the Association of Mathematics Teacher Educators Annual Conference; Houston, TX. 3. Snider, R. (2017, February) What Knowledge is Used in Giving an Explanation? Enacting Mathematical Knowledge for Teaching in Practice. Presentation at the Association of Mathematics Teacher Educators Annual Conference; Orlando, FL.	3 years of High School Mathematics teaching Served as mathematics supervisor for student teachers in middle and high schools.
Sweeney, Ruth	M.Ed. in Secondary Education/Mathematics,	Clinical Supervisor and adjunct instructor	Adjunct	No	Former Secretary and Treasurer of Morrisville Education Association. Former Mathematics Department Chairperson at Morrisville High School.	PA and NJ Mathematics Secondary Education teaching certificate. Over 30 years teaching experience in middle school/high school
Van der Sandt, Suriza	Ph.D., Mathematics Education, Potchefstroo	Faculty, Clinical Supervisor	Professor	Yes	1.Van der Sandt, S. (August 2018). A Case Study: Teachers' Confidence in Their Own and Their Students' Abilities in Deaf / Hard of Hearing High School Mathematics Classrooms. . Undergraduate Mathematics Preparation of School Teachers: The Journal (Volume 5: Teacher Attributes). [www.k-12prep.math.ttu.edu] (15p.) 2.Van der Sandt, S. & Meddleton, M. (2018). The Availability, Use and Professional Development of Technology in K-12 USA Mathematics Classrooms. Proceedings of the Canadian International Conference of Education. Toronto: Canada, 23-28 June 2018. (6p.) 3.Van der Sandt, S. & O'Brien, S. (Fall 2017). The Impact of Instructor Teaching Style in a College-Level Content Course Addressing Mathematics Anxiety of Preservice Teachers with Different	Mathematics supervisor for student teachers in elementary, middle, and high schools.