

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

Clarion University

2. State

Pennsylvania

3. Date submitted

MM DD YYYY

03 / 15 / 2018

4. Report Preparer's Information:

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6. Name of institution's program

Bachelor of Science in Mathematics Education

7. CAEP Category

Mathematics Education

8. Grade levels⁽¹⁾ for which candidates are being prepared

7-12

(1) e.g. 7-12, 9-12

9. Program Type

First teaching license

10. Degree or award level

Baccalaureate

Post Baccalaureate

Master's

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

PA Instructional Level I Certification in 7-12 Grade Mathematics

14. Program report status:

Initial Review

Response to One of the Following Decisions: Further Development Required or Recognition with Probation

Response to National Recognition with Conditions

15. Is your Educator Preparation provider (EPP) seeking

CAEP accreditation for the first time (initial accreditation)

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

No

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)

Clarion University of Pennsylvania (CUP) is one of the 14 state universities in the Pennsylvania State System of Higher Education (PASSHE). Members of the PASSHE system are governed by the Chancellor and Board of Governors of the PASSHE and must align with their policies. The PASSHE policy placing an upper limit of 120 credit hours for any bachelor's degree programs influences how CUP's teacher education programs integrate the NCTM/CAEP standards for the secondary mathematics education program.

The Pennsylvania Department of Education (PDE) is the governing body in Pennsylvania for all teacher certification programs. CUP must align with Pennsylvania law and PDE regulations. There are six major PDE regulations that influence the teacher certification programs at CUP. PDE requires that all candidates to pass the PAPA/PRAXIS core, exit GPA, PDE form #430, PRAXIS II, SPED and ELL requirements, early field experience hours and alignment with the INTASC principles.

1. Candidates must pass PAPA/PRAXIS Core exams (Reading, Writing, and Mathematics) with a combined score of 522 to remain in the certification program.
2. Candidates must earn at least a 3.0 overall GPA at the time of application for certification, and earn a passing score on the PDE form #430 student teaching evaluation in each of the four categories: Planning, Classroom Environment, Instructional Delivery, and Professionalism.
3. The PDE requires that all teacher certification programs include early field experience hours in four stages: 40 hours of Observation and Exploration (Stages 1 & 2), 150 hours of Pre-student teaching (Stage 3) and a minimum of 12 weeks of full-time student teaching (Stage 4).
4. The PDE requires that all teacher certification programs in Pennsylvania include at least 9 credits of English Language Learner coursework (or hourly equivalent of integrated coursework).
5. Candidates must also pass their PRAXIS II content exam before certification.
6. The PDE uses the 10 INTASC principles as the standards for professional competency. These INTASC standards serve as benchmarks for teacher preparation programs in Pennsylvania, and align with CUP's conceptual framework.

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)

The Pennsylvania Department of Education (PDE) requires expanded hours of field experience throughout the four-year teacher certification programs. This means that teacher candidates must spend more hours in public school classrooms than previously required. The four stages of PDE field experience requirements are Observation Stage 1 (minimum of 20 hours), Exploration

Stage 2 (minimum of 20 hours), Pre-Student Teaching Stage 3 (minimum of 150 hours) and Student Teaching Stage 4 (minimum of 12 weeks). Many of the field experiences exceed these minimum hours. Clarion University of Pennsylvania requires a full semester of student teaching or 15 to 17 weeks.

Each stage is progressively more intensive, requiring the candidate to gradually assume more responsibility. Throughout the stages, a cooperating teacher must have a teaching certificate and at least 3 years of satisfactory teaching experience within the certification. During stages 3 and 4, the cooperating teacher must be certified to teach secondary mathematics, have taught for at least 3 years in a 7 - 12 mathematics classroom and acquired tenure. In the Observation Stage 1, the candidate acquires observation skills and knowledge of child development. In the Exploration Stage 2, the candidate acquires observation and assessment skills, knowledge of child development and Pennsylvania academic standards, skill in planning based on observations and standards, knowledge of child environments and ability to assess them, knowledge of community agencies and skill of advocacy, interacting and communicating with parents. Required assignments include maintaining observation logs signed by the cooperating teacher(s) and completing observation reports. The university professors give feedback on the assignments to assess and advance the candidates knowledge and skills and connect theory to practice.

The following courses are involved in Stage 1 and 2 (ED 110 Foundations of Education, ED 122 Educational Psychology, ED 350 English Language Learners). In Stage 3, the candidates acquire knowledge of the mathematical practices and gain understanding that these practices intersect with mathematical content and the understanding relies on the ability to demonstrate these practices within and among mathematical domains and in their teaching. Additionally, in Stage 3, the candidates incorporate research-based mathematical experiences, multiple instructional strategies, and technology in their teaching to develop students' understanding and proficiency. The candidates acquire knowledge in planning, selecting, implementing, interpreting, and using formative and summative assessments. The candidates gain knowledge of adolescent learning, development and behavior and use the knowledge to plan and create sequential learning opportunities.

Over two semesters prior to student teaching, the Stage 3 courses include ED 327 (Instructional Strategies and Management), ED 350 (English Language Learners), SPED 418 (Exceptionalities in the Regular Classroom), SPED 441 (Teaching Secondary students with Disabilities), SPED 442 (Differentiated Instruction), ED 339 (Teaching and Evaluation of Mathematics), ED 329 (Educational Assessment) and ED 417 (Technology Instruction for Educators). The field experience during Stage 3 includes a 4-week, one-half day field experience in the 7 - 12 grade mathematics classroom. After learning the theory incorporated in each of the courses, the candidates are assigned to a

specific classroom for "mornings only" during the 4-week experience. In the afternoons, the candidates return to campus for mathematics content courses. It is anticipated that the candidates will spend a minimum of 20 hours per week in the secondary classroom. Both university supervisors and cooperating professionals provide supervision that is paramount to the candidate's achievement. The cooperating teachers must have significant experience in teaching mathematics and be successful in their practice. The university supervisors represent faculty who teach courses in the blocked courses and hence, provide supervision that is aligned not only to the individual course but to the secondary mathematics program. Teacher candidates are evaluated using the Clarion University of Pennsylvania Competency Evaluation: Field Experience in Secondary Education. The overall performance indicators are as follows: Planning and Preparation (demonstrates knowledge of content, sets clear objectives for each instructional episode, collaborates with others as instructional partners, and develops developmentally appropriate and effective instructional plans); Classroom Environment (demonstrates and encourages a positive attitude for learning, handles discipline problems effectively, exhibits respect for individual differences); Instruction (demonstrates ability to explain content clearly, expresses appropriate language, grammar, and voice qualities, motivates learners effectively, exhibits enthusiasm) and Professionalism (communicates professionally and effectively with learners, meets professional responsibilities, accepts and responds to constructive feedback professionally). During stage 3, cooperating teachers are included in activity planning with university faculty prior to the beginning of the pre-student teaching experience. They are also responsible for completing candidate evaluation forms and providing productive candidate performance feedback.

Pre-requisites to student teaching include the completion of 90 semester hours, satisfactory standing in admission and retention standards, completion of all required professional courses in the certification areas with a minimum grade of "C" and 3.0 GPA. During Student Teaching stage 4, the candidate acquires the ability to use skills and knowledge gained in stages one through three. The student teaching courses provide candidates with 16 weeks of student teaching in various grade levels 7 - 12. Each candidate will have a junior high and senior high experience. A teacher work sample will be assessed in the junior high placement and senior high placement. ED 424/425 Secondary Student Teaching, the professional practicum requires integration and application of planning, instructional and professional knowledge and competencies in secondary schools. During the first two weeks, the teacher candidate progresses through the orientation phase of student teaching by developing a familiarity with the students, classrooms, school organizations, and community, and by observing, team teaching, and teaching several lessons. After an orientation to the high school classroom, teacher candidates fulfill the requirements under the direction of a cooperating teacher and university supervisor. Teacher candidates gradually teach two to five subjects or classes continually between the third and seventh week. They are required to teach the cooperating teachers' full time schedule for a minimum of one week during

the final weeks of the experience. Two field assignments offer diversity in grade levels, ability levels of the students, content areas, school and community size, multicultural settings, and /or cooperating professionals.

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.

Secondary Mathematics Education Course Descriptions	Secondary Mathematics Education Program of Study
Long Range Program Planning Advisement	

See the Attachment panel.

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.

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.

Program: BSED Secondary Mathematics		
Academic Year	# of Candidates Enrolled in the Program	# of Program Completers ⁽²⁾
2017 - 2018	24	1

(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.

Faculty Member Name	Marcella McConnell
Highest Degree, Field, & University ⁽³⁾	PhD, Curriculum & Instruction Mathematics Education Concentration, Kent State University
Assignment: Indicate the role of the faculty member ⁽⁴⁾	Teaches ED 339 (Teaching and Evaluation of Mathematics Methods Course), ED 122 (Educational Psychology), Teaching Faculty, Student Teacher Supervisor, Assessment Coordinator
Faculty Rank ⁽⁵⁾	Full-time Instructor
Tenure Track	<input checked="" type="checkbox"/> YES
Scholarship ⁽⁶⁾ , Leadership in Professional Associations,	1. (Article) McConnell, M., & Caniglia, J. (2016). Math Rocks. Mathematics Teaching in the Middle School, 21(6), 384-385. 2. (PDE Grant work) Improving Elementary Mathematics Instruction, PDE MSP Title IIB grant awarded to Allegheny Intermediate Unit Mathematics & Science

and Service ⁽⁷⁾ :List up to 3 major contributions in the past 3 years ⁽⁸⁾	Collaborative, Pittsburgh, PA, June 2016 to September 2018. 3. (Session Presentation) Technology Usage to Promote Mathematical Thinkers, 30th Annual International Conference on Technology in Collegiate Mathematics, Washington DC, March 2018.
Teaching or other professional experience in P-12 schools ⁽⁹⁾	Certification: Pennsylvania Mathematics 7-12 Public School Experience: Karns City High School (August 2004 - 2010) Taught Calculus, Pre-Calculus, Algebra I, Pre-Algebra, Fundamental Algebra, Integrated Mathematics I & II, and Math 7 Keystone High School (August 2001 - May 2004) Taught AP Calculus, Integrated Mathematics I, Advanced Mathematics, Mathematics Essentials II, PSSA Prep, Algebra I, Pre-Algebra, Math 7 Professional Experience: Cooperating teacher partnered with Clarion University (2007, 2009), partnered with Slippery Rock University (2008) Partnered with the Allegheny Intermediate Unit Math & Science Collaborative (AIU MSC) to address the needs of 34 public schools. Planned and facilitated mathematics professional development for elementary teachers, K - 5 grade level. (June 2016 to September 2018)

Faculty Member Name	John McCullough
Highest Degree, Field, & University ⁽³⁾	EdD, Curriculum & Instruction, Indiana University of Pennsylvania
Assignment: Indicate the role of the faculty member ⁽⁴⁾	Teaches ED 417 (Technology Integration for Educators), Education Department Chair, Teaching Faculty, Student Teacher Supervisor
Faculty Rank ⁽⁵⁾	Full Professor
Tenure Track	<input checked="" type="checkbox"/> YES
Scholarship ⁽⁶⁾ , Leadership in Professional Associations, and Service ⁽⁷⁾ :List up to 3 major contributions in the past 3 years ⁽⁸⁾	1. Clarion University of Pennsylvania School of Education Social Media director (Facebook, Twitter, and Instagram) 2. Webmaster for the Clarion University's Electronic Assessment Evidence website 3. Coordinator of Clarion University of Pennsylvania Instructional Technology Specialist Certification Program
Teaching or other professional experience in P-12 schools ⁽⁹⁾	Certification: Pennsylvania Mathematics 7-12 Public School Experience: Cranberry High School (1985 - 1989) Taught Math 7, 8 and Pre-Algebra

Faculty Member Name	Michael McConnell
Highest Degree, Field, & University ⁽³⁾	PhD, Mathematics, Kent State University
Assignment: Indicate the role of the faculty member ⁽⁴⁾	Teaches MATH 270 (Calculus I), MATH 451 (Modern Algebra I), MATH 390 (Junior Seminar) and MATH 490 (Senior Seminar), Teaching faculty, Assessment Coordinator
Faculty Rank ⁽⁵⁾	Full Professor
Tenure Track	<input checked="" type="checkbox"/> YES
Scholarship ⁽⁶⁾ , Leadership in Professional Associations, and Service ⁽⁷⁾ :List up to 3 major contributions in the past 3 years ⁽⁸⁾	1. (Session Presentation) Desmos and Geogebra: Teaching Calculus Conceptually. 30th Annual International Conference on Technology in Collegiate Mathematics, Washington DC, March 2018. 2. (Textbook) McConnell, M.K., & McConnell, M.J. (2016). Algebra and Trigonometry for Middle School Teachers. NY: Linus Learning. 3. (Session Presentation) Preparing Teachers for Differentiated Algebra Instruction. 66th Annual Meeting of Pennsylvania Council of Teachers of Mathematics. Seven Springs, PA, August 2016.

Teaching or other professional experience in P-12 schools ⁽⁹⁾	Certification: Pennsylvania Mathematics 7-12, Ohio English 7-12 Grand River Academy, Austinberg, Ohio (1998-1999) Taught English grades 8-12 and tutored mathematics during study halls. Professional Experience: Organized, Designed, and Presented Mathematics Activities for local high schools (7-12) mathematically talent students, Clarion HS, April 2016, Keystone HS, May 2016 & 2017, and November 2017, North Clarion HS May 2017, Cranberry HS, November 2017, New Day Charter School, January 2018, Kiski HS, March 2018
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(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)

Type and Number of Assessment	Name of Assessment (10)	Type or Form of Assessment (11)	When the Assessment Is Administered (12)
Assessment #1: Licensure assessment, or other content-based assessment aligned to <i>NCTM Mathematics Content for Secondary</i> (required)	PRAXIS II Mathematics Content Knowledge (5161)	State Licensure Test Content Knowledge	Candidates are encouraged to take this during their junior year prior to student teaching.
Assessment #2: Content knowledge in secondary mathematics aligned to <i>NCTM Mathematics Content for Secondary</i> (required)	Mathematics Content Course Grades	Mathematics Content Courses Performance Assessment Content Knowledge	Candidates must pass these courses with a "C" or better prior to student teaching.
Assessment #3: Candidate ability to plan instruction (required)	Mathematics Education Portfolio	Performance Assessment Planning for Instruction	Completed during Stage 3 (Pre-student teaching) during ED 339 course as part of their field experience.
Assessment #4: Student teaching (required)	Student Teaching Performance Profile	Performance Assessment	Completed during Stage 4 (Student Teaching) in ED 424/425. The candidates will be evaluated with this assessment twice. One completed in a 8 week junior high placement and the another in a 8 week senior high placement.
Assessment #5: Candidate effect on student leaning (required)	Field Based Unit Plan	Performance Assessment Impact on Student Learning	

			Completed during Stage 4 (Student Teaching) in ED 424/425. The candidates will create one unit plan for each placement. One junior high content unit plan and the other a senior high content unit plan.
Assessment #6: Content knowledge in secondary mathematics aligned to NCTM Mathematics Content for Secondary (required)	Comprehensive Exams	Comprehensive Exams Content Knowledge	Completed as a component of ED 339. The candidates take the exams throughout the semester during the ED 339 professor's office hours.
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

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.

#1 #2 #3 #4 #5 #6 #7 #8

#1	#2	#3	#4	#5	#6	#7	#8
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Standard 2: Mathematical Practices

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.

2b) Reason abstractly, reflectively, and quantitatively with attention to units, constructing viable arguments and proofs, and critiquing the

#1 #2 #3 #4 #5 #6 #7 #8

#1	#2	#3	#4	#5	#6	#7	#8
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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.

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.

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.

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:

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.

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.

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.

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.

		✓	✓	✓			

5. Standard 5: Impact on Student Learning

#1 #2 #3 #4 #5 #6 #7 #8

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.

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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.

5b) Engage students in developmentally appropriate mathematical activities and investigations that require active engagement and include mathematics-specific technology in building new knowledge.

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.

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6. Standard 6: Professional Knowledge and Skills

#1 #2 #3 #4 #5 #6 #7 #8

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 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

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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.

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7. Standard 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.

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Preservice teacher candidates:

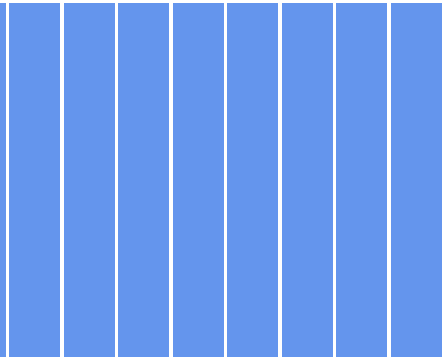
7a) Engage in a sequence of planned field experiences and clinical practice prior to a full-time student teaching/internship experience that include observing and participating in both middle and high school mathematics classrooms and working with a diverse range of students individually, in small groups, 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

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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.



SECTION IV - EVIDENCE FOR MEETING STANDARDS

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 than 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

Assessment #1 - PRAXIS II (5161) Licensure Exam

See the Attachment panel.

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 background in the subject to be taught. (Assessment Required)

Provide assessment information as outlined in the directions for Section IV

Assessment #2: Content Knowledge in Mathematics (Mathematics Course Grades)

See the Attachment panel.

(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.

- 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 lesson or unit plans, individualized educational plans, needs assessments, or intervention plans. (Assessment Required)

Provide assessment information as outlined in the directions for Section IV

ASSESSMENT #3- Candidate Ability to Plan Instruction Mathematics Education Portfolio	Research Project Investigating the Knowledge of Students
Common Core Standards Reaction Paper	

See the Attachment panel.

- 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

Assessment #4 Student Teaching

See the Attachment panel.

- 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

Assessment #5 - (Unit Plan: Impact on Student Learning Assignment)
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See the Attachment panel.

- 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

Assessment #6 – Content Comprehensive Exams

See the Attachment panel.

- 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

- 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

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)

While the number of students completing Assessment #1 (Praxis II scores), and Assessment #6 (Competency Exams) in the ED 339 course were quite small, there were some overriding themes, which also matched with data procured from Assessment #2 (Course Grades), and the analysis of the standards alignment that went into Assessment #2.

At present our students struggle with probability and statistics. The required course that covers probability and statistics, MATH 321 Intermediate Applied Statistics I, is a difficult course for all students across all mathematics programs. It requires students to have a strong background in Calculus, and Algebra, while at the same time having them extend that knowledge to a new area that does not appear elsewhere in the curriculum. It is also a largely theoretical course focused on probability, and less on applied topics such as inference. The mathematics faculty will likely recommend to Education Department (which formally houses the BSED Secondary Education Mathematics program) to require the course MATH 221 Elementary Applied Statistics, and have that requirement replace an elective course. This should improve the program in a number of ways. First, this will ensure that the program meets standard A.4.2 that concerns statistical inference. MATH 321 does not cover statistical inference in any great detail, and the more rigorous review of the standards versus our more detailed course descriptions reveals an obvious deficiency here. Second, there is significant overlap between MATH 221 and MATH 321, however MATH 221 approaches those topics at lower, more approachable level. Students in MATH 321 can find themselves setting up complex integrals without understanding the purpose of the integral, or the application in which they are working. Requiring the elementary class should afford the students a beginning understanding of probability and statistics prior to taking a higher level, more theoretical course. The belief is that this change will improve student learning in the MATH 321 class. Finally, Praxis II scores indicate that there is room for improvement in teacher candidates' knowledge of probability and statistics. An analysis of the types of questions asked of students on Praxis II in this area indicate a mixture of the type of material covered in MATH 221 and MATH 321. Requiring MATH 221 should significantly improve teacher candidate performance on Praxis II, due to enhanced student learning as a result of requiring the MATH 221 content.

The program change would codify and make clearer an option many students already take. Students already have an option of taking MATH 221 as an

elective in the BSED Secondary Education Mathematics program. As it is an elective some students elect not to take it, and others take the course after, or concurrent with MATH 321. Requiring it as part of the program would not allow students to take other options, less aligned with standards. MATH 221 will also no longer "compete" with upper division options as an elective, and it will be taken earlier in the program so that it can aide students when completing MATH 321.

The other major change under consideration is to require MATH 111 Mathematical Concepts in Grades K-8. Like MATH 221 course, this course is already an optional elective that many students choose to take. In reviewing the alignment of course descriptions to the standards in completing the report on Assessment #2 the mathematics faculty came to the conclusion that while MATH 451 Modern Algebra I is satisfying all of the standards listed in a technical sense, it does not appear to be satisfying all of those standards in the spirit in which the standards are written. Requiring MATH 111 should have the teacher candidates improve content knowledge in Praxis II, and Competency Exam scores. It should also have a less tangible impact related to the assessments. Most of the teacher candidates have not thought about elementary and middle level mathematics instruction, since being elementary and middle school students themselves. It seems obvious that having a course that discusses current approaches to those topics will only serve to benefit the teacher candidates as they will better understand the background their future students will come to them with. Finally, just like with MATH 221, requiring the course instead of having it listed as an elective will allow the course to be taken earlier in the program. This should improve student learning by helping to pave the way for courses such as MATH 451, and being of a greater benefit when taking Praxis II.

The two above changes would be major curricular changes that eliminate program electives, and replace them with requirements. Another change is far less drastic, but will serve to improve alignment with the standards. In aligning the standards for the report of Assessment #2 it became clear to the mathematics faculty that the BSED Secondary Education Mathematics program could do a better job on satisfying the standards concerning history in each content area. Numerous options have been discussed. The first, and perhaps most straightforward, would have been to write a mathematics history course that focused on historical development and perspectives of various content areas including contributions of significant figures and diverse cultures. There was reluctance of the mathematics faculty to eliminate the upper level mathematics elective in favor of such a course. An option was also discussed where such a course would be written, and a request would be made to count the course as a Social and Behavioral Sciences class in Clarion University's general education program (as history classes currently satisfy this requirement). The political climate within the university makes it unlikely that this request would be approved through the curricular process. After abandoning the writing of a new course to satisfy this standard the

mathematics faculty came to the conclusion that it would make more sense to incorporate into existing content courses, material related to historical development and perspectives of various content areas including contributions of significant figures and diverse cultures. This seems to be in better keeping with the intent of the standards (in that history is not its own standard, but instead included within each of the existing content standards), and would not force the students to study the historical concepts in a vacuum devoid of the relevant content material. The mathematics faculty are currently working to find ways to include this content as a unit in the relevant content courses, that would have assessment such as reflection papers written on historical articles, reports written on historical figures or events, or exam questions that include historical content. This change would significantly improve student learning related to historical development and perspectives of various content areas including contributions of significant figures and diverse cultures, as this material would now be woven throughout the entire program.

The biggest change to the program will be the anticipated hire of a tenure track Mathematics Educator to begin in fall 2018. The failure of the BSED Secondary Education Mathematics program to be reaccredited in the summer of 2017 lead the chairs of the Departments of Education, and Chemistry, Mathematics and Physics to make a joint request to the Dean of Arts, Education and Sciences for a tenure track position in Mathematics Education. The Dean in turn made this position a top priority in his advocacy to the Provost for positions within the College of Arts, Education and Sciences. Clarion University currently has serious budget issues, and the President and Provost have been very conservative in recent years with the addition of tenure track faculty. Clarion University is only conducting 13 tenure track searches this academic year, and only 3 within the College of Arts, Education and Sciences. The failure of this program to be fully reaccredited was a wakeup call to the departments overseeing the program, and to the university administration that this program could no longer be placed on the back burner.

The addition of this position should serve to improve this program in a number of ways. It will improve communication between the Education Department, and the Department of Chemistry, Mathematics and Physics. It will provide a steady influence in the program that will allow for the newly developed Competency Exams to be fully integrated in the ED 339 Methods in Teaching & Evaluating Mathematics. It will also allow a the assessment loop to be closed as the new Mathematics Educator (who will be housed within the Department of Chemistry, Mathematics and Physics) will be able to bring data from those Competency Exams to regular department meetings, and will be able to share anecdotal information also on a more regular basis. As a tenure track position the person hired will be expected to teach courses in the program other than the ED 339 which will give the position, and hence the departments, a better understanding of how best to prepare the teacher candidates. Having a tenure track position in Mathematics Education will improve student learning, as the person can fully "take ownership" over the ED 339 course as opposed to simply

being hired to teach an existing course. Modifications to the course can be made that are both small, and large. The tenure track Mathematics Education can make recommendations on changes to the course description, outcomes, and further refine assessments administered in the course.

Assessment #3, #4, and #5 had limited data to analyze with one completer in the 2017 - 2018 timeframe and 3 other candidates during the fall 2017 semester taking the ED 339 course. Since these assessments were revised and/or changed, the mathematics educator welcomed and sought out feedback. The small number of candidates allowed for interviews and reflections that lead to insights into how the candidates felt the program prepared them for student teaching. Candidates expressed difficulties in implementing high level tasks because of a lack of prior experiences for them and the students they were teaching. Overall, the candidates expressed a need to gain more skill in using prior knowledge to build conceptual understanding. The revised rubrics with each assessment emphasized the importance of the NCTM/CAEP standards and clarified expectations to deal with the deficiencies in the previous rubrics, which did not represent the program and/or provide evidence to the candidates on their performance.

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

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)

The BSED Secondary Education Mathematics faculty took to heart the findings in the SPA's decision of "Further Development Required" or "National Recognition with Probation." Assessment #2 has been significantly improved. Typos and omissions of course names have been corrected. Part 2 of Assessment #2 has been significantly improved to include a "Detailed Description Demonstrating Alignment" in addition to the catalog course descriptions. These descriptions should make clear that the standards are satisfied in the courses listed in the alignment table.

Assessment #6 has been completely redone to address the SPA decision. The MATH 490 Senior Seminar class was never designed for students to demonstrate diverse content knowledge across a range of mathematical material. It was designed for students to do an in depth study in one area of mathematics (perhaps even as local as a single problem), write a paper on that area, and give a presentation. The SPA decision made clear that utilizing this course (and its primary assignment of the above paper/presentation) to assess content knowledge throughout the program was inappropriate.

The mathematics faculty in conjunction with the temporary mathematics education faculty member developed a series of content knowledge assessments that are to be delivered in the ED 339 Methods in Teaching & Evaluating Mathematics course. The ED 339 course is the immediate preparation for student teaching where teacher candidates will be utilizing their content knowledge on a daily basis. The teacher candidate has little control over whether the student teaching will be in the area of pre-algebra, algebra, geometry, trigonometry, pre-calculus, statistics, or calculus. Given this uncertainly built into the student teaching assignment, it seems appropriate for teacher candidates to review this diverse content knowledge in the ED 339 course so that they can reflect on their strengths, and weakness (in fact a formal part of the assignment), and take steps to improve weakness.

The exams were created to align with the NCTM standards, and can be used by the teacher candidates to help prepare for the Praxis II exam. For each exam a detailed rubric was created, and applied by multiple faculty. While the teacher

candidates in ED 339 "dreaded" each upcoming content exam, to a person, they all found the exams to be useful and instructive.

Assessment 3 and 5 rubrics were clarified and more specifically aligned to the standards. Assessment #4 was replaced with an assessment that was more appropriately aligned with the standards rather than a more general education assessment.

An analysis of the SPA decision and of the new assessments have convinced program faculty of the need to require MATH 111 Mathematical Concepts in Grades K-8 and MATH 221 Elementary Applied Statistics in the program instead of listing these courses as optional electives. As stated above this should improve content alignment with the standards, improve student learning, and better prepare teacher candidates future coursework (MATH 321 and MATH 451), and for the Praxis II exam.

The SPA decision was also a call to action that resulted in a search being approved for a tenure track Mathematics Education position. The search is ongoing, however the Search Committee currently reports the existence of a viable pool, with the anticipation that with the successful completion of the search, the tenure track Mathematics Educator will begin with the fall 2018 semester. This position will be housed within the Department of Chemistry, Mathematics and Physics. The position will serve as a liaison between the departments of Education and Chemistry, Mathematics and Physics while also serving as the program coordinator for the Secondary Education Mathematics program. This should be the most impactful change relative to the overall success of this program with a focus on student learning. This position will have standing in both of the relevant academic departments to recommend program changes to keep the program in alignment with accreditation standards in the future, and to be making constant recommendations to improve student learning.

Please click "Next"

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