

NATIONAL RECOGNITION REPORT

Initial Preparation of Mathematics Teachers at the Secondary Level (2012 Standards)

National recognition of this program is dependent on the review of the program by representatives of the National Council of Teachers of Mathematics (NCTM).

COVER PAGE

Name of Institution

Lehman College - Cuny School of Education, NY

Date of Review

MM DD YYYY

02 / 01 / 2021

This report is in response to a(n):

- Initial Review
- Revised Report
- Response to Conditions Report

Program Covered by this Review

Mathematics 7-12 Undergraduate

Grade Level⁽¹⁾

7-12

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

Program Type

First teaching license

Award or Degree Level

- Baccalaureate
- Post Baccalaureate
- Master's

PART A - RECOGNITION DECISION

SPA decision on national recognition of the program(s):

- Nationally recognized
- Nationally recognized with conditions
- Further development required **OR** Nationally recognized with probation **OR** Not nationally recognized [See Part G]

Test Results (from information supplied in Assessment #1, if applicable)**The program meets or exceeds SPA benchmarked licensure test data requirement, if applicable:**

- Yes
- No
- Not applicable
- Not able to determine

Comments, if necessary, concerning Test Results:

Under CAEP, there is no stated policy and no CAEP standard stating an 80% pass rate requirement on licensure tests. Additional information can be found at <http://www.caepnet.org/accreditation/caep-accreditation/spa-program-review-process/data-requirements-for-spa-review>.

Summary of Strengths:

Lehman College is to be commended for its major focus on teaching in urban settings with LUTE initiative. The candidates at Lehman receive many experiences with diverse student populations, including students with exceptionalities, second language learners, and the gifted and talented. Additionally, Lehman College is using assessment data to support candidates as they design and redesign courses, course materials, and other experiences.

PART B - STATUS OF MEETING SPA STANDARDS

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*.

Met



Met with Conditions



Not Met



Standard 1 Comments:

State-required licensure test(s) aligned to NCTM CAEP Mathematics Content for Secondary and at least one additional assessment collectively demonstrating at least an 80% alignment to each domain of the NCTM CAEP Mathematics Content for Secondary providing evidence that Element 1a* is met at the acceptable or target level are required in order to satisfy the preponderance of evidence for Standard 1.

*: Indicates essential (required) element

Section III of the program report indicates Assessments 1, 2, and 7 address this standard.

*Element 1a: MET

Assessment 1 (NY CST 004) provides evidence for the mathematical domain competencies specified in the NCTM CAEP Mathematics Content for Secondary alignment on the NCTM website (www.nctm.org/caep) and noted in the Feedback section below.

Assessment 2 (Course Grades) provides evidence for the mathematical domain competencies noted in the Feedback section below.

Assessment 7 (Statistical Analysis and the Use of Technology) has the potential to provide evidence but rubrics are not aligned to sub-elements. Additionally, rubric descriptions (particularly those using words like consistently, regularly, mostly, rarely, most, some, few, sketchy, skimpy) do not sufficiently convey specific and discernible candidate behaviors that would characterize performance at each level and assure

interrater reliability.

Feedback on the NCTM CAEP Mathematics Content for Secondary alignment:

A.1 Number and Quantity Competencies SATISFIED (At least 80% competency alignment)

Competencies A.1.1, A.1.3, and A.1.4 were met in the 8/1/2020 Recognition Report by Assessment 1.

Competency A.1.4 was met in the 8/1/2020 Recognition Report by Assessment 2. Assessment 1 (NY CST 004) continues to provide evidence for A.1.1, A.1.3, and A.1.4. Assessment 2 (Course Grades) provides evidence for A.1.1 (MAT 237, 314, CMP 167), A.1.2 (MAT 236, 314, CMP 167), A.1.3 (MAT 175, 176), A.1.4 (MAT 313, 237), and A.1.5 (MAT 343).

A.2 Algebra Competencies SATISFIED (At least 80% competency alignment)

Competencies A.2.1, A.2.2, A.2.3, A.2.4, and A.2.6 were met in the 8/1/2020 Recognition Report by Assessment 1.

Competencies A.2.5 and A.2.6 were met in the 8/1/2020 Recognition Report by Assessment 2.

Assessment 1 (NY CST 004) continues to provide evidence for A.2.1, A.2.2, A.2.3, A.2.4, and A.2.6.

Assessment 2 (Course Grades) provides evidence for A.2.1 (MAT 175, 176, 237), A.2.2 (MAT 175, 176, 237, CMP 167), A.2.3 (MAT 175, 237), A.2.4 (MAT 175, 176), A.2.5 (MAT 313), A.2.6 (MAT 314), and A.2.7 (MAT 343).

A.3 Geometry and Trigonometry Competencies SATISFIED (At least 80% competency alignment)

Assessment 1 (NY CST 004) provides evidence for A.3.1, A.3.2, A.3.3, A.3.4, A.3.5, A.3.6, A.3.8, and A.3.9.

Assessment 2 (Course Grades) provides evidence for A.3.1 (MAT 345), A.3.2 (MAT 314, 345), A.3.3 (MAT 345, 314), A.3.4 (MAT 345, 176), A.3.5 (MAT 175, 176), A.3.6 (MAT 226, 345), A.3.8 (MAT 345), and A.3.10 (MAT 343, 345). MAT 345 provides partial evidence for A.3.9 (does not address conics). There is insufficient evidence for A.3.7 (MAT 345 does not clearly address the competency).

A.4 Statistics and Probability Competencies SATISFIED (At least 80% competency alignment)

Assessment 1 (NY CST 004) provides evidence for A.4.3, A.4.4, and A.4.5.

Assessment 2 (Course Grades) provides evidence for A.4.2 (ESC 301), A.4.4 (MAT 237), and A.4.6 (MAT 343). There is partial evidence for A.4.3 (ESC 301 and MAT 237 do not address graphical representations of data). There is insufficient evidence for A.4.1 (ESC 301 does not clearly address the competency), A.4.5 (ESC 301 and MAT 237 do not clearly address the competency).

A.5 Calculus Competencies SATISFIED (At least 80% competency alignment)

Competencies A.5.3 and A.5.4 were met in the 8/1/2020 Recognition Report by Assessment 2.

Assessment 1 (NY CST 004) provides evidence for A.5.1, A.5.3, and A.5.5.

Assessment 2 (Course Grades) provides evidence for A.5.1 (MAT 175, 176), A.5.3

(MAT 175, 320), A.5.4 (MAT 226), A.5.5 (MAT 175, 176, 226), and A.5.6 (MAT 343). There is partial evidence for A.5.2 (MAT 225 does not address polar functions).

A.6 Discrete Mathematics Competencies SATISFIED (At least 80% competency alignment)

Competency A.6.4 was met in the 8/1/2020 Recognition Report by Assessment 2. Assessment 2 (Course Grades) provides evidence for A.6.1 (MAT 237), A.6.2. (MAT 237), A.6.3 (MAT 237), A.6.4 (MAT 237, CMP 167), and A.6.5 (MAT 343).

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 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.

Met

Met with Conditions

Not Met



Standard 2 Comments:

In order to satisfy the preponderance of evidence for Standard 2, Elements 2a*, 2b*, and at least 2 additional elements must be met at the acceptable or target level; at least two assessments must provide collective evidence for the overall Standard.

*: Indicates essential (required) elements

Section III of the program report indicates Assessments 2, 3, 4, and 6 address this standard.

*Element 2a: MET

Element 2a was met in the 8/1/2020 Recognition Report by Assessments 2, 3, 4, and 6.

*Element 2b: MET

Element 2b was met in the 8/1/2020 Recognition Report by Assessments 3, 4, and 6.

Element 2c: MET

Element 2c was met in the 8/1/2020 Recognition Report by Assessments 2, 3, 4, and 6.

Element 2d: MET

Element 2d was met in the 8/1/2020 Recognition Report by Assessments 2, 4, and 6.

Element 2e: MET

Element 2e was met in the 8/1/2020 Recognition Report by Assessments 2 and 6.

Element 2f: MET

Element 2f was met in the 8/1/2020 Recognition Report by Assessments 2 and 6.

Standard 3: Content Pedagogy

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.

3b) Analyze and consider research in planning for and leading students in rich mathematical learning experiences.

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.

3d) Provide students with opportunities to communicate about mathematics and make connections among mathematics, other content areas, everyday life, and the workplace.

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

3f) Plan, select, implement, interpret, and use formative and summative assessments to inform instruction by reflecting on mathematical proficiencies essential for all students.

3g) Monitor students' progress, make instructional decisions, and measure students' mathematical understanding and ability using formative and summative assessments.

Met

Met with Conditions

Not Met



Standard 3 Comments:

element must be met at the acceptable or target level; at least two assessments must provide collective evidence for the overall Standard.

*: Indicates essential (required) elements

Section III of the program report indicates Assessments 3, 4, 5, 6, and 8 address this standard.

*Element 3a: MET

Element 3a was met in the 8/1/2020 Recognition Report by Assessments 3 and 6.

Element 3b: MET

Element 3b was met in the 8/1/2020 Recognition Report by Assessments 4, 5, and 6.

*Element 3c: MET

Element 3c was met in the 8/1/2020 Recognition Report by Assessments 3, 5, and 6.

Element 3d: MET

Element 3d was met in the 8/1/2020 Recognition Report by Assessments 4 and 6.

Element 3e: MET

Element 3e was met in the 8/1/2020 Recognition Report by Assessment 6.

*Element 3f: MET

Element 3f was met in the 8/1/2020 Recognition Report by Assessments 3 and 5.

Element 3g: MET

Element 3g was met in the 8/1/2020 Recognition Report by Assessment 4.

Standard 4: Mathematical Learning Environment

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.

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.

Met

Met with Conditions

Not Met



Standard 4 Comments:

In order to satisfy the preponderance of evidence for Standard 4, Elements 4b*, 4d*, and 4e* must be met at the acceptable or target level; at least two assessments must provide collective evidence for the overall Standard.

*: Indicates essential (required) elements

Section III of the program report indicates Assessments 3, 4, 5, 7, and 8 address this standard.

Element 4a: MET

Element 4a was met in the 8/1/2020 Recognition Report by Assessment 4.

*Element 4b: MET

Element 4b was met in the 8/1/2020 Recognition Report by Assessments 3 and 4.

Element 4c: MET

Element 4c was met in the 8/1/2020 Recognition Report by Assessment 4.

*Element 4d: MET

Element 4d was met in the 8/1/2020 Recognition Report by Assessments 4 and 5.

*Element 4e: MET

Element 4e was met in the 8/1/2020 Recognition Report by Assessments 3 and 4.

Standard 5: Impact on Student Learning

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.
- 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.

Met

Met with Conditions

Not Met



Standard 5 Comments:

In order to satisfy the preponderance of evidence for Standard 5, Element 5c* and at least 1 additional element must be met at the acceptable or target level; at least two assessments must provide collective evidence for the overall Standard.

*: Indicates essential (required) elements

Section III of the program report indicates Assessments 3, 4, and 5 address this standard.

Element 5a: MET

Element 5a was met in the 8/1/2020 Recognition Report by Assessments 4 and 5.

Element 5b: MET

Element 5b was met in the 8/1/2020 Recognition Report by Assessments 3, 4, and 5.

*Element 5c: MET

Element 5c was met in the 8/1/2020 Recognition Report by Assessment 5.

Standard 6: Professional Knowledge and Skills

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 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.

Met

Met with Conditions

Not Met



Standard 6 Comments:

In order to satisfy the preponderance of evidence for Standard 6, Element 6b* and at least 1 additional element must be met at the acceptable or target level; at least two assessments must provide collective evidence for the overall Standard.

*: Indicates essential (required) elements

Section III of the program report indicates Assessments 4 and 5 address this standard.

Element 6a: MET

Element 6a was met in the 8/1/2020 Recognition Report by Assessment 4.

*Element 6b: MET

Assessment 4 (STEF) provides partial evidence for Element 6b. Only distinguished and proficient levels address use of research to inform practice; does not address enhancing all students' knowledge of mathematics or involving stakeholders. For this element, Assessment 4 employs a generic rubric that does not address specific NCTM elements or sub-elements.

Assessment 5 (Impact on Student Learning) new elements provide evidence for Element 6b.

Element 6c: MET

Element 6c was met in the 8/1/2020 Recognition Report by Assessments 4 and 8.

Standard 7: Secondary Mathematics Field Experiences and Clinical Practice

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.

Met



Met with Conditions



Not Met



Standard 7 Comments:

Information included in Section I - Context #2 of the program report for Element 7a* and in Section I - Context #2 and #6 for Element 7b* and at least one assessment for Element 7c* providing evidence that Elements 7a*, 7b*, and 7c* are met at the acceptable or target level are required in order to satisfy the preponderance of evidence for Standard 7.

*: Indicates essential (required) elements

*Element 7a: MET

Element 7a was met in the 8/1/2020 Recognition Report by Section I Context #2:.

*Element 7b: MET

Element 7b was met in the 8/1/2020 Recognition Report by Section I Context #2 and

#6.

Section III of the program report indicates Assessments 4 and 8 address Element 7c*.

*Element 7c: MET

Element 7c was met in the 8/1/2020 Recognition Report by Assessments 4 and 8.

PART C - EVALUATION OF PROGRAM REPORT EVIDENCE

C.1. Candidates' knowledge of content

Additional data for Assessment 1 (NY CST 004) and revised course descriptions in Assessment 2 (Course Grades) provide sufficient evidence of Candidates' content knowledge. Assessment 7 (Statistical Analysis and the Use of Technology) has the potential to provide evidence but rubrics are not aligned to subelements; this assessment appears to have not been revised.

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

Assessment 3 (Plan for Instruction), 4 (STEF), 6 (Problem Solving Episode), and 8 (Portfolio) continue to address candidates' ability to understand and apply pedagogical and professional content knowledge, and skills and dispositions. Additional rubric elements for Assessment 4 provide evidence for previously unmet elements. Assessments 3, 6, and 8 were not resubmitted.

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

Assessments 3 (Plan for Instruction), 4 (Student Teacher Observation Evaluation), and 5 (Impact on Student Learning) continue to provide evidence of candidate effects on P-12 student learning.

PART D - EVALUATION OF THE USE OF ASSESSMENT RESULTS

Evidence that assessment results are evaluated and applied to the improvement of candidate performance and strengthening of the program (as discussed in Section V of the program report)

It is clear that Lehman College is using assessment data to improve candidate performance and strengthen the program. They have developed workshop series in an effort to insure student success in Calculus 1 and on the Mathematics state exam. They have also developed a three-year strategic plan to strengthen their program which includes: "Increase the passing rates in NYSED certification exams while strengthening and expanding areas of expertise of candidates. And, redefine rigor in mathematics instruction according to the corresponding instructional levels defined by the CCSS content standards and best teaching practices through the implementation of differentiation and collaboration strategies within and across program sequences." Consequently, the faculty are designing and redesigning courses and course materials. In response to difficulty in meeting Statistics and Probability competencies, a change has been made to the program of studies to include MAT 330: Probability and Statistics.

PART E - AREAS FOR CONSIDERATION

Areas for consideration

NCTM 2020 Standards for Secondary and Middle Level Mathematics were released in Summer 2020. Documentation can be found at www.nctm.org/caep. Programs should

begin transitioning assessments to align with the new standards.

PART F - ADDITIONAL COMMENTS

F.1. Comments on Section I (Context) and other topics not covered in Parts B-E:

F.2. Concerns for possible follow-up by the CAEP site visitors:

PART G - DECISIONS

Please select final decision:

- National Recognition.** The program is recognized through the semester and year of the provider's next CAEP accreditation decision in 5-7 years. The Recognition Report will serve as program level evidence for the accreditation cycle it has been initiated. **To retain recognition and to gather new evidence for the next accreditation cycle, another program report must be submitted mid-cycle 3 years in advance of the next scheduled accreditation visit.** The program will be listed as Nationally Recognized through the semester of the next CAEP accreditation decision on websites and/or other publications of the SPA and CAEP. The institution may designate its program as Nationally Recognized by the SPA, through the semester of the next CAEP accreditation decision, in its published materials. *Please note that once a program has been Nationally Recognized, it may not submit another report addressing any unmet standards or other concerns cited in the recognition report.*

Please click "Next"

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