

NATIONAL RECOGNITION REPORT

Preparation of Mathematics Education Teachers Secondary Level

Southeastern Louisiana University
August 10, 2007

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

This report is in response to a(n):

- Initial Review
 Revised Report
 Response to Conditions

Program(s) Covered by this Review	Program Type	Award or Degree Level(s)
Mathematics Education Grade Level: Secondary	Initial teacher license in field	Baccalaureate

PART A—RECOGNITION DECISION (see Part G for specifics on decision)

A.1—SPA Decision on NCATE recognition of the program(s):

- Nationally recognized
 Nationally recognized with conditions
 Not nationally recognized

A.2—Test Results (from information supplied in Assessment #1, if applicable)

The program meets or exceeds an 80% pass rate on state licensure exams:

- Yes
 No
 Not applicable
 Not able to determine

A.3—Summary of Strengths:

The program has clear opportunities for candidates to experience field and student teaching placements. Candidate evaluations by a variety of observers were very positive. A clear effort has been made to align the program with the NCTM indicators.

PART B—STATUS OF MEETING SPA STANDARDS AND INDICATORS

M = Met NM = Not Met

NCTM Standards (Secondary)	Specific Program or Level: Baccalaureate	Specific Program or Level
MATHEMATICS PREPARATION FOR ALL MATHEMATICS TEACHER CANDIDATES		
<p>Standard 1. Knowledge of Problem Solving. Candidates know, understand and apply the process of mathematical problem solving.</p> <p>Indicators:</p> <p>1.1 Apply and adapt a variety of appropriate strategies to solve problems.</p>	M	
<p>1.2 Solve problems that arise in mathematics and those involving mathematics in other contexts.</p>	M	
<p>1.3 Build new mathematical knowledge through problem solving.</p>	M	
<p>1.4 Monitor and reflect on the process of mathematical materials problem solving.</p>	M	
Comment:		
<p>Standard 2. Knowledge of Reasoning and Proof. Candidates reason, construct, and evaluate mathematical arguments and develop an appreciation for mathematical rigor and inquiry.</p> <p>Indicators:</p> <p>2.1 Recognize reasoning and proof as fundamental aspects of mathematics.</p>	M	
<p>2.2 Make and investigate mathematical conjectures.</p>	M	
<p>2.3 Develop and evaluate mathematical arguments and proofs.</p>	M	
<p>2.4 Select and use various types of reasoning and methods of proof.</p>	M	
Comment: Most indicators are covered by only one assessment.		
<p>Standard 3. Knowledge of Mathematical Communication. Candidates communicate their mathematical thinking orally and in writing to peers, faculty and others.</p> <p>Indicators:</p> <p>3.1 Communicate their mathematical thinking coherently and clearly to peers, faculty, and others.</p>	M	
<p>3.2 Use the language of mathematics to express ideas precisely.</p>	M	
<p>3.3 Organize mathematical thinking through communication.</p>	M	
<p>3.4 Analyze and evaluate the mathematical thinking and strategies of others.</p>	M	
Comment: Indicators well assessed.		
<p>Standard 4. Knowledge of Mathematical Connections. Candidates recognize, use, and make connections between and among mathematical ideas and in contexts outside mathematics to build mathematical understanding.</p> <p>Indicators:</p> <p>4.1 Recognize and use connections among mathematical ideas.</p>	M	
<p>4.2 Recognize and apply mathematics in contexts outside of mathematics.</p>	M	
<p>4.3 Demonstrate how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>	M	
Comment:		

NCTM Standards (Secondary)	Specific Program or Level: Baccalaureate	Specific Program or Level
<p>Standard 5. Knowledge of Mathematical Representation. Candidates use varied representations of mathematical ideas to support and deepen students' mathematical understanding.</p> <p>Indicators:</p> <p>5.1 Use representations to model and interpret physical, social, and mathematical phenomena.</p>	M	
<p>5.2 Create and use representations to organize, record, and communicate mathematical ideas.</p>	M	
<p>5.3 Select, apply, and translate among mathematical representations to solve problems.</p>	M	
Comment:		
<p>Standard 6. Knowledge of Technology. Candidates embrace technology as an essential tool for teaching and learning mathematics.</p> <p>Indicators:</p> <p>6.1 Use knowledge of mathematics to select and use appropriate technological tools, such as but not limited to, spreadsheets, dynamic statistical packages, graphing calculators, data-collection devices, and presentation software.</p>	M	
Comment:		
<p>Standard 7. Dispositions. Candidates support a positive disposition toward mathematical processes and mathematical learning.</p>		
<p>Indicators:</p> <p>7.1 Attention to equity</p>	M	
<p>7.2 Use of stimulating curricula</p>	M	
<p>7.3 Effective teaching</p>	M	
<p>7.4 Commitment to learning with understanding</p>	M	
<p>7.5 Use of various assessments</p>	M	
<p>7.6 Use of various teaching tools including technology</p>	M	
Comment:		
<p>Standard 8. Knowledge of Mathematics Pedagogy. Candidates possess a deep understanding of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning.</p> <p>Indicators:</p> <p>8.1 Selects, uses, and determines suitability of the wide variety of available mathematics curricula and teaching materials for all students including those with special needs such as the gifted, challenged and speakers of other languages.</p>	M	
<p>8.2 Selects and uses appropriate concrete materials for learning mathematics.</p>	M	
<p>8.3 Uses multiple strategies, including listening to and understanding the ways students think about mathematics, to assess students' mathematical knowledge.</p>	M	
<p>8.4 Plans lessons, units and courses that address appropriate learning goals, including those that address local, state, and national mathematics standards and legislative mandates.</p>	M	
<p>8.5 Participates in professional mathematics organizations and uses</p>	M	

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their print and on-line resources.		
8.6 Demonstrates knowledge of research results in the teaching and learning of mathematics.	M	
8.7 Uses knowledge of different types of instructional strategies in planning mathematics lessons.	M	
8.8 Demonstrates the ability to lead classes in mathematical problem solving and in developing in-depth conceptual understanding, and to help students develop and test generalizations.	M	
8.9 Develop lessons that use technology's potential for building understanding of mathematical concepts and developing important mathematical ideas.	M	
Comment: Indicators well assessed.		
MATHEMATICS PREPARATION FOR SECONDARY LEVEL MATHEMATICS TEACHER CANDIDATES		
<p>Standard 9. Knowledge of Number and Operations. Candidates demonstrate computational proficiency, including a conceptual understanding of numbers, ways of representing number, relationships among number and number systems, and the meaning of operations.</p> <p>Indicators:</p> <p>9.1 Analyze and explain the mathematics that underlies the procedures used for operations involving integers, rational, real, and complex numbers.</p>	M	
9.2 Use properties involving number and operations, mental computation, and computational estimation.	M	
9.3 Provide equivalent representations of fractions, decimals, and percents.	M	
9.4 Create, solve, and apply proportions.	M	
9.5 Apply the fundamental ideas of number theory.	M	
9.6 Make sense of large and small numbers and number systems.	M	
9.7 Compare and contrast properties of numbers and number systems.	M	
9.8 Represent, use, and apply complex numbers.	M	
9.9 Recognize matrices and vectors as systems that have some of the properties of the real number system.	M	
9.10 Demonstrate knowledge of the historical development of number and number systems including contributions from diverse cultures.	NM	
Comment: Lacks history of math assessment. Most indicators are covered by only one assessment.		
<p>Standard 10. Knowledge of Different Perspectives on Algebra. Candidates emphasize relationships among quantities including functions, ways of representing mathematical relationships, and the analysis of change.</p> <p>Indicators:</p> <p>10.1 Analyze patterns, relations, and functions of one and two variables.</p>	M	
10.2 Apply fundamental ideas of linear algebra.	M	
10.3 Apply the major concepts of abstract algebra to justify	M	

NCTM Standards (Secondary)	Specific Program or Level: Baccalaureate	Specific Program or Level
algebraic operations and formally analyze algebraic structures.		
10.4 Use mathematical models to represent and understand quantitative relationships.	M	
10.5 Use technological tools to explore algebraic ideas and representations of information and in solving problems.	M	
10.6 Demonstrate knowledge of the historical development of algebra including contributions from diverse cultures.	NM	
Comment: Lacks history of math assessment.		
Standard 11. Knowledge of Geometries. Candidates use spatial visualization and geometric modeling to explore and analyze geometric shapes, structures, and their properties.		
Indicators:		
11.1 Demonstrate knowledge of core concepts and principles of Euclidean and non-Euclidean geometries in two and three dimensions from both formal and informal perspectives.	M	
11.2 Exhibit knowledge of the role of axiomatic systems and proof in geometry.	M	
11.3 Analyze characteristics and relationships of geometric shapes and structures.	M	
11.4 Build and manipulate representations of two- and three-dimensional objects and visualize objects from different perspectives.	M	
11.5 Specify locations and describe spatial relationships using coordinate geometry, vectors, and other representational systems.	M	
11.6 Apply transformations and use symmetry, similarity, and congruence to analyze mathematical situations.	M	
11.7 Use concrete models, drawings, and dynamic geometric software to explore geometric ideas and their applications in real-world contexts.	M	
11.8 Demonstrate knowledge of the historical development of Euclidean and non-Euclidean geometries including contributions from diverse cultures.	M	
Comment:		
Standard 12. Knowledge of Calculus. Candidates demonstrate a conceptual understanding of limit, continuity, differentiation, and integration and a thorough background in techniques and application of the calculus.		
Indicators:		
12.1 Demonstrate a conceptual understanding of and procedural facility with basic calculus concepts.	M	
12.2 Apply concepts of function, geometry, and trigonometry in solving problems involving calculus.	M	
12.3 Use the concepts of calculus and mathematical modeling to represent and solve problems taken from real-world context.	M	
12.4 Use technological tools to explore and represent fundamental concepts of calculus.	M	
12.5 Demonstrate knowledge of the historical development of	NM	

NCTM Standards (Secondary)	Specific Program or Level: Baccalaureate	Specific Program or Level
calculus including contributions from diverse cultures.		
Comment: Lacks history of math assessment.		
<p>Standard 13. Knowledge of Discrete Mathematics. Candidates apply the fundamental ideas of discrete mathematics in the formulation and solution of problems.</p> <p>Indicators:</p> <p>13.1 Demonstrate knowledge of basic elements of discrete mathematics such as graph theory, recurrence relations, finite difference approaches, linear programming, and combinatorics.</p>	M	
13.2 Apply the fundamentals ideas of discrete mathematics in the formulation and solution of problems arising from real-world situations.	M	
13.3 Use technological tools to solve problems involving the use of discrete structures and the application of algorithms.	NM	
13.4 Demonstrate knowledge of the historical development of discrete mathematics including contributions from diverse cultures.	NM	
Comment: In general, Standard 13 needs additional assessment.		
<p>Standard 14. Knowledge of Data Analysis, Statistics, and Probability. Candidates demonstrate an understanding of concepts and practices related to data analysis, statistics, and probability.</p> <p>Indicators:</p> <p>14.1 Design investigations, collect data, and use a variety of ways to display data and interpret data representations that may include bivariate data, conditional probability and geometric probability.</p>	M	
14.2 Use appropriate methods such as random sampling or random assignment of treatments to estimate population characteristics, test conjectured relationships among variables, and analyze data.	M	
14.3 Use appropriate statistical methods and technological tools to describe shape and analyze spread and center.	M	
14.4 Use statistical inference to draw conclusions from data.	M	
14.5 Identify misuses of statistics and invalid conclusion from probability.	M	
14.6 Draw conclusions involving uncertainty by using hands-on and computer-based simulation for estimating probabilities and gathering data to make inferences and conclusions.	M	
14.7 Determine and interpret confidence intervals.	NM	
14.8 Demonstrate knowledge of the historical development of statistics and probability including contributions from diverse cultures.	M	
Comment: Most indicators are covered by only one assessment.		
<p>Standard 15. Knowledge of Measurement. Candidates apply and use measurement concepts and tools.</p> <p>Indicators:</p> <p>15.1 Recognize the common representations and uses of measurement and choose tools and units for measuring.</p>	M	
15.2 Apply appropriate techniques, tools, and formulas to determine measurements and their application in a variety of contexts.	M	

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15.3 Completes error analysis through determining the reliability of the numbers obtained from measures.	M	
15.4 Demonstrate knowledge of the historical development of measurement and measurement systems including contributions from diverse cultures.	NM	
Comment: Lacks history of math assessment.		
<p>Standard 16. Field-Based Experiences. Candidates complete field-based experiences in mathematics classrooms.</p> <p>Indicators:</p> <p>16.1 Engage in a sequence of planned opportunities prior to student teaching that includes observing and participating in both middle and secondary mathematics classrooms under the supervision of experienced and highly qualified teachers.</p>	M	
16.2 Experience full-time student teaching in secondary mathematics that is supervised by a highly qualified teacher and a university or college supervisor with secondary mathematics teaching experience.	M	
16.3 Demonstrate the ability to increase students' knowledge of mathematics.	M	
Comment: Indicators well assessed.		

PART C—EVALUATION OF PROGRAM REPORT EVIDENCE

C.1—Candidates' knowledge of content

In general, candidates' content knowledge was addressed thoroughly. Additional assessments need to address history of math and discrete math topics.

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

Candidates' ability to understand and apply pedagogical and professional content knowledge, skills, and dispositions was addressed thoroughly. Assessment #3 scoring guide is not mathematics specific.

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

Candidate effect on P-12 student learning is minimally assessed needs to be developed more fully.

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)

Evidence of assessment of professional and pedagogical knowledge, skill, and dispositions was missing in Section V. Evidence of assessment of student learning was also missing.

PART E—AREAS FOR CONSIDERATION

Development of an assessment to evaluate history of math indicators should be considered. Consideration of coverage of discrete math topics (indicators) in math major courses offered. Evaluation of assessments that address candidates' professional and pedagogical knowledge, skill, and dispositions should be completed. Evaluation of assessments that address candidates' understanding of student learning should be completed.

PART F—ADDITIONAL COMMENTS

F.1—Comments on context and other topics not covered in Parts B-E:

Since there is only a small sample of candidates, it is difficult for the institution to evaluate assessment results fully at this time. A more complete evaluation should be done in the future.

F.2—Concerns for possible follow-up by the Board of Examiners:

PART G—TERMS AND SUBSEQUENT ACTIONS FOR DECISIONS

Program is nationally recognized. The program is recognized through the semester and year of the institution's next NCATE accreditation visit in 5-7 years. To retain recognition, another program report must be submitted before that review. The program will be listed as nationally recognized through the semester of the next NCATE review on websites and/or other publications of the SPA and NCATE. The institution may designate its program as nationally recognized by NCATE, through the semester of the next NCATE accreditation review, in its published materials. **National recognition is dependent upon NCATE accreditation.**

Subsequent action by the institution: None. Nationally recognized programs may not file revised reports addressing any unmet standards or other concerns noted in this report.