NCATE 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**
Southeastern Oklahoma State University

**Date of review**
07 / 11 / 2008

**This report is in response to a(n):**
- Initial Review
- Revised Report
- Response to Conditions Report

**Program Covered by this Review**
Mathematics Education

**Program Type**
First Teaching License

**Award or Degree Level**
- Baccalaureate
- Post Baccalaureate
- Master's

**PART A - RECOGNITION DECISION**

**SPA Decision on NCATE Recognition of the Program(s):**
- Nationally recognized
- Nationally recognized with conditions
- Further development required OR Nationally recognized with probation [See Part G]
- Not nationally recognized

**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

Comment:

Summary of Strengths:
The institution is making a concerted effort to strengthen areas that assessments revealed as weaker than others.

Candidates are required to have field experiences with students of diverse backgrounds and in different settings.

PART B - STATUS OF MEETING SPA STANDARDS

Standard 1. Knowledge of Problem Solving. Candidates know, understand and apply the process of mathematical problem solving.

Indicators:

1.1 Apply and adapt a variety of appropriate strategies to solve problems.

- Met
- Not Met

1.2 Solve problems that arise in mathematics and those involving mathematics in other contexts

- Met
- Not Met

1.3 Build new mathematical knowledge through problem solving.

- Met
- Not Met

1.4 Monitor and reflect on the process of mathematical problem solving.

- Met
- Not Met

Standard 1 comments:

Indicators:

2.1 Recognize reasoning and proof as fundamentals aspects of mathematics.

Met | Not Met
---|---
Not Met | Not Met

2.2 Make and investigate mathematical conjectures

Met | Not Met
---|---
Not Met | Not Met

2.3 Develop and evaluate mathematical arguments and proofs.

Met | Not Met
---|---
Not Met | Not Met

2.4 Select and use various types of reasoning and methods of proof.

Met | Not Met
---|---
Not Met | Not Met

Standard 2 comments:

Standard 3. Knowledge of Mathematical Communication. Candidates communicate their mathematical thinking orally and in writing to peers, faculty and others.

Indicators:

3.1 Communicate their mathematical thinking coherently and clearly to peers, faculty, and others.

Met | Not Met
---|---
Not Met | Not Met

3.2 Use the language of mathematics to express ideas precisely.

Met | Not Met
---|---
Not Met | Not Met

3.3 Organize mathematical thinking through communication

Met | Not Met
---|---
Not Met | Not Met

3.4 Analyze and evaluate the mathematical thinking and strategies of others.

Met | Not Met
---|---
Not Met | Not Met
Standard 3 comments:

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.

Indicators:
4.1 Recognize and use connections among mathematical ideas.
Met Not Met
jn jn

4.2 Recognize and apply mathematics in contexts outside of mathematics.
Met Not Met
jn jn

4.3 Demonstrate how mathematical ideas interconnect and build on one another to produce a coherent whole.
Met Not Met
jn jn

Standard 4 comments:

Standard 5. Knowledge of Mathematical Representation. Candidates use varied representations of mathematical ideas to support and deepen students’ mathematical understanding.

Indicators:
5.1 Use representations to model and interpret physical, social, and mathematical phenomena.
Met Not Met
jn jn

5.2 Create and use representations to organize, record, and communicate mathematical ideas
Met Not Met
jn jn

5.3 Select, apply, and translate among mathematical representations to solve problems
Met Not Met
jn jn

Standard 5 comments:

Indicators:

6.1 Use knowledge of mathematics to select and use appropriate technological tools, such as but not limited to, spreadsheets, dynamic graphing tools, computer algebra systems, dynamic statistical packages, graphing calculators, data-collection devices, and presentation software.

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Standard 6 comments:
This NCTM standard indicator was met using Assessments 4 and 5. It was difficult to understand how Assessment 1 (OSAT test) addresses this indicator.


Indicators:

7.1 Attention to equity

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7.2 Use of stimulating curricula

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7.3 Effective teaching

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7.4 Commitment to learning with understanding

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7.5 Use of various assessments

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7.6 Use of various teaching tools including technology

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Indicators:

8.1 Select, use, and determine 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.

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8.2 Select and use appropriate concrete materials for learning mathematics.

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8.3 Use multiple strategies, including listening to and understanding the ways students think about mathematics, to assess students’ mathematical knowledge.

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8.4 Plan lessons, units and courses that address appropriate learning goals, including those that address local, state, and national mathematics standards and legislative mandates.

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8.5 Participate in professional mathematics organizations and uses their print and on-line resources.

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8.6 Demonstrate knowledge of research results in the teaching and learning of mathematics.

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8.7 Use knowledge of different types of instructional strategies in planning mathematics lessons.

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8.8 Demonstrate the ability to lead classes in mathematical problem solving and in developing in-depth conceptual understanding, and help students develop and test generalizations.
8.9 Develop lessons that use technology’s potential for building understanding of mathematical concepts and developing important mathematical ideas.

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**Standard 8 comments:**

**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 meanings of operations.

**Indicators:**

9.1 Analyze and explain the mathematics that underlies the procedures used for operations involving integers, rational, real, and complex numbers.

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9.2 Use properties involving number and operations, mental computation, and computational estimation.

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9.3 Provide equivalent representations of fractions, decimals, and percents.

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9.4 Create, solve, and apply proportions.

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9.5 Apply the fundamental ideas of number theory.

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9.6 Makes sense of large and small number and number systems.

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9.7 Compare and contrast properties of numbers and number systems.
9.8 Represent, use and apply complex numbers
Met      Not Met
jn      jn

9.9 Recognize matrices and vectors as systems that have some of the properties of the real number system.
Met      Not Met
jn      jn

9.10 Demonstrate knowledge of the historical development of number and number systems including contributions from diverse cultures.
Met      Not Met
jn      jn

Standard 9 comments:


Indicators:

10.1 Analyze patterns, relations, and functions of one and two variables.
Met      Not Met
jn      jn

10.2 Apply fundamental ideas of linear algebra.
Met      Not Met
jn      jn

10.3 Apply the major concepts of abstract algebra to justify algebraic operations and formally analyze algebraic structures.
Met      Not Met
jn      jn

10.4 Use mathematical models to represent and understand quantitative relationships.
Met      Not Met
jn      jn
10.5 Use technological tools to explore algebraic ideas and representations of information and in solving problems.

Met Not Met
jn jn

10.6 Demonstrate knowledge of the historical development of algebra including contributions from diverse cultures.

Met Not Met
jn jn

Standard 10 comments:


Indicators:

11.1 Demonstrate knowledge of core concepts and principles of Euclidean and non-Euclidean geometry in two- and three-dimensions from both formal and informal perspectives.

Met Not Met
jn jn

11.2 Exhibit knowledge of the role of axiomatic systems and proof in geometry.

Met Not Met
jn jn

11.3 Analyze characteristics and relationships of geometric shapes and structures.

Met Not Met
jn jn

11.4 Build and manipulate representations of two- and three-dimensional objects and visual objects from different perspectives.

Met Not Met
jn jn

11.5 Specify locations and describe spatial relationships using coordinate geometry, vectors and other representational systems.

Met Not Met
jn jn

11.6 Apply transformation and use symmetry, similarity, and congruence to analyze mathematical situations.

Met Not Met
11.7 Use concrete models, drawings, and dynamic geometric software to explore geometric ideas and their applications in real-world contexts.
Met
Not Met

11.8 Demonstrate knowledge of the historical development of Euclidean and non-Euclidean geometries including contributions from diverse cultures.
Met
Not Met

Standard 11 comments:


Indicators:

12.1 Demonstrate a conceptual understanding of and procedural facility with basic calculus concepts.
Met
Not Met

12.2 Apply concepts of function, geometry, and trionometry in solving problems involoving calculus.
Met
Not Met

12.3 Use the concepts of calculus and mathematical modleing to represent and solve problems taken from real-world context.
Met
Not Met

12.4 Use technological tools to explore and represent fundamental concepts of calculus.
Met
Not Met

12.5 Demonstrate knowledge of the historical development of calculus including contributions from diverse cultures.
Met
Not Met

Indicators:

13.1 Demonstrate knowledge of basic elements of discrete mathematics such as graph theory, recurrence relations, finite difference approaches, linear programming, and combinatorics.

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13.2 Apply the fundamental ideas of discrete mathematics in the formulation and solution of problems arising from real-world situations.

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13.3 Use technological tools to solve problems involving the use of discrete structures and application of algorithms.

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13.4 Demonstrate knowledge of the historical development of discrete mathematics including contributions from diverse cultures.

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Indicators:

14.1 Design investigations, collect data, and use a variety of ways to display the data and interpret data representations that may include bivariate data, conditional probability and geometric probability.

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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.
14.3 Use appropriate statistical methods and technological tools to describe shape and analyze spread and center.

14.4 Use statistical inference to draw conclusions from data.

14.5 Identify misuses of statistics and invalid conclusions from probability

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.

14.7 Determine and interpret confidence intervals.

14.8 Demonstrates knowledge of the historical development of probability and statistics including contributions from diverse cultures.

Standard 14 comments:


Indicators:

15.1 Recognize the common representations and uses of measurement and choose tools and units for measuring.

15.2 Apply appropriate techniques, tools, and formulas to determine measurements and their
application in a variety of contexts.

15.3 Complete error analysis through determining the reliability of the numbers obtained from measures.

15.4 Demonstrate knowledge of the historical development of measurement and measurement systems including contributions from diverse cultures.

Standard 15 comments:


Indicators:

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.

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.

16.3 Demonstrate the ability to increase students’ knowledge of mathematics.

Standard 16 comments:

Pre-internship field experiences are described for this program. It would appear that after the initial field experience in EDUC 2013, there are no further field experiences until the semester prior to student teaching. There seems to be a large gap of time between the pre-internship field experiences and the semester prior to student teaching. In the student teaching experience, the report states "...the mentor teacher is responsible for guiding the candidate throughout the student teaching experience, with little to no input from university faculty in the candidate's major field of study. The Department of Mathematics at SOSU has chosen to include Mathematics Education faculty in the student teaching process. In
addition to supervision by the professional mentor, a Mathematics Education faculty member from the Department of Mathematics at SOSU is responsible for supervising the candidate's student teaching experience.” In one sentence it is indicated that no university faculty are involved, but in the next sentence it says that they are. This should be clarified.

PART C - EVALUATION OF PROGRAM REPORT EVIDENCE

C.1. Candidates’ knowledge of content
Assessments 1, 2, and 6 provided enough evidence on candidate's knowledge of content. Assessments 1 and 2 cover the majority of the content areas. Assessments 6, 7, and 8 also cover smaller portions of this. In Assessment 7 only one question per indicator is on this exit exam. These indicators, however, were covered by other assessments.

C.2. Candidates’ ability to understand and apply pedagogical and professional content knowledge, skills, and dispositions
Enough evidence was provided from assessments 4 and 5 on the candidate’s ability to understand and apply pedagogical and professional content knowledge, skills, and dispositions. The weak area that the reviewers see here is in assessment 3. Four items in the lesson plan component list are not required in the lesson plan format.

C.3. Candidate effects on P-12 student learning
Assessment 5 addresses this in the Teacher Work Sample.

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 is presented in the report indicating that each assessment and its results have been evaluated. It is apparent that this information will be used for the improvement of candidates’ performance and the strengthening of the program. The institution indicated a number of changes that either have already been implemented or are in the process of being implemented. Changes are designed to improve areas where assessments have shown weak areas.

PART E - AREAS FOR CONSIDERATION

Areas for consideration
Improvements and more data collection are recommended for assessments 7 and 8 of the report. As mentioned in comments under Standard 16, field experiences and student teacher supervision need clarification.

PART F - ADDITIONAL COMMENTS

F.1. Comments on Section I (Context) and other topics not covered in Parts B-E:
The institution did a very nice job of organizing their material and generally presented it in a very clear and straightforward manner.

F.2. Concerns for possible follow-up by the Board of Examiners:
PART G - DECISIONS

Please select final decision:

Program is nationally recognized. The program is recognized through the semester and year of the institution's next NCATE accreditation decision 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 accreditation decision 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 decision, in its published materials. National recognition is dependent upon NCATE accreditation.

Please click "Next"

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