

College of Science and Health Professions
Department of Natural Sciences
Remedy/Assessment Report for
BS Environmental Science

The intent of the Department and College is to phase out the program as soon as possible. The request to terminate and phase out the program will be brought to CEPC Fall 2011.

ASSESSMENT MATRIX
 KEY ASSESSMENTS & DISSEMINATION PROCESSES
 NSU Advanced Teacher Preparation
M. Ed. Mathematics Education

DESCRIPTION			PROCESSES & PROCEDURES				ACTIONS	
Instrument Name	Brief Description	Unit / Program/ Candidate	Data Collected (Who/When)	Aggregation (Who/When)	Dissemination (Who/When)	Analysis (Who/When)	Recommendations (What type of change? Eg. – curriculum? Clinical experiences? Teaching? Procedures / processes, etc.?)	Sharing / Dissemination Groups / Units
<p>Capstone Mathematics Content Examination</p> <p>NCATE Assessment #1</p>	A test of candidates' knowledge of mathematics at the completion of the program	Program/ Candidate	MATH 5992 – Typically Final semester of coursework and administered by Capstone Course Advisor	Course instructor	Department Chair/ Program Chair	Department Chair/ Program Chair	Potential changes to the mathematics curriculum of the Graduate Mathematics Education Program for course content	<ul style="list-style-type: none"> •Shared with M. Ed. Mathematics Education faculty at annual faculty meetings; also shared with unit administrators, Department Chairs, & Program Chairs •COE Assessment Committee as requested
<p>GPA in Mathematics Content Courses</p> <p>NCATE Assessment #2</p>	A measure of candidates' knowledge of mathematics content as indicated by GPA in mathematics content courses	Program/ Candidate	Collected upon Graduation	Department Chair/ Program Chair	Department Chair/ Program Chair	Department Chair/ Program Chair	Potential changes to the mathematics curriculum of the Graduate Mathematics Education Program for course content	<ul style="list-style-type: none"> •Shared with M. Ed. Mathematics Education faculty at annual faculty meetings; also shared with unit administrators, Department Chairs, & Program Chairs •COE Assessment Committee as requested

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<p>Lesson Plan Submission</p> <p>NCATE Assessment #3</p>	<p>During Capstone semester, candidates will write and submit a lesson plan that demonstrates in-depth understanding of mathematics and the theories related to pedagogy and learning and which also reflects a range of instructional strategies and technologies.</p>	<p>Program/ Candidate</p>	<p>MATH 5992 – Typically Final semester of coursework</p>	<p>Course Instructor</p>	<p>Department Chair/ Program Chair</p>	<p>Department Chair/ Program Chair</p>	<p>Potential changes to the mathematics curriculum of the Graduate Mathematics Education Program for course content</p>	<ul style="list-style-type: none"> •Shared with M. Ed. Mathematics Education faculty at the annual faculty meetings; also shared with unit administrators, Department Chairs, & Program Chairs •COE Assessment Committee as requested
<p>Capstone Project</p> <p>NCATE Assessment #4</p>	<p>A project demonstrating knowledge and application of mathematics and pedagogy and can take on the form of a curriculum unit, National Board Certification, or the completion of a mathematics education research project initiated in DUC 5103</p>	<p>Program/ Candidate</p>	<p>MATH 5992 – Typically Final semester of coursework</p>	<p>Course instructor</p>	<p>Department Chair/ Program Chair</p>	<p>Department Chair/ Program Chair</p>	<p>Potential changes to the mathematics curriculum of the Graduate Mathematics Education Program for course content</p>	<ul style="list-style-type: none"> •Shared with M. Ed. Mathematics Education faculty at the annual faculty meetings; also shared with unit administrators, Department Chairs, & Program Chairs •COE Assessment Committee as requested

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<p>Faculty Advisor Assessment of Teaching</p> <p>NCATE Assessment #5</p>	<p>During Capstone semester, candidates will teach a lesson which reflects how he/she has applied data driven assessment decisions to teaching so that all students can learn.</p>	<p>Program/ Candidate</p>	<p>MATH 5992 – Typically Final semester of coursework</p>	<p>Course Instructor</p>	<p>Department Chair/ Program Chair</p>	<p>Department Chair/ Program Chair</p>	<p>Potential changes to the mathematics curriculum of the Graduate Mathematics Education Program for course content</p>	<ul style="list-style-type: none"> •Shared with M. Ed. Mathematics Education faculty at the annual faculty meetings; also shared with unit administrators, Department Chairs, & Program Chairs •COE Assessment Committee as requested
<p>Successful Completion of EDUC 5103</p> <p>NCATE Assessment #6</p>	<p>Successful completion of EDUC 5103 [Grade of B or Better] indicates that candidates are able to analyze educational research and policies and can explain the implications of their own practice and for the profession</p>	<p>Program/ Candidate</p>	<p>Must be taken during the first 12 to 15 hours of the program</p>	<p>Program Advisor</p>	<p>Department Chair/ Program Chair</p>	<p>Department Chair/ Program Chair</p>	<p>Data will serve to suggest the need for potential pre-requisites for individual candidates.</p>	<ul style="list-style-type: none"> •Shared with M. Ed. Mathematics Education faculty at the annual faculty meetings; also shared with unit administrators, Department Chairs, & Program Chairs •COE Assessment Committee as requested

Student Learning Outcome Information: College of Science and Health Professions

Preparing for Higher Learning Commission (HLC) visit to NSU

Department of Mathematics and Computer Science

M. Ed. Mathematics Education

●What are the student learning outcomes for this program?

1. Candidates in the M. Ed. Mathematics Education program will have an in-depth conceptual knowledge of the content that they teach.

2. Candidates in the M. Ed. Mathematics Education program will have an in-depth understanding of their field and of the theories related to pedagogy and learning. They are able to select and use a broad range of instructional strategies that promote student learning and are able to clearly explain the choices they make in their practice.

As experienced teachers, they will build upon and extend their knowledge and experiences to improve their own teaching and student learning in the classroom. They further develop their knowledge, skills, and professional dispositions to support the propositions of the National Board for Professional Teaching Standards [NBPTS] for the advanced certification of teachers.

3. Candidates in the M. Ed. Mathematics Education program will participate in experiences that require them to apply course work in classroom settings, analyze P-12 student learning, and reflect on their practice in the context of theories on teaching and learning. These experiences may include but are not limited to those which focus on students with exceptionalities and students from diverse ethnic/ racial, linguistic, gender, and socioeconomic groups.

4. Candidates in the M. Ed. Mathematics Education program will have a thorough understanding of the major concepts and theories related to assessing student learning and regularly apply these in their practice. They analyze student, classroom, and school performance data and make data-driven decisions about strategies for teaching and learning so that all students learn. They are aware of and utilize school and community resources that support student learning.

5. Candidates in the M. Ed. Mathematics Education program are aware of current research and policies related to schooling, teaching, learning, and best practices. They are able to analyze

educational research and policies and can explain the implications for their own practice and for the profession.

●What instruments or processes are used to assess student learning outcomes?

1. To assess Student Learning Outcome #1, students in this advanced program will take a Capstone Exam during the semester in which they enroll in MATH 5992 and complete their Capstone project. This assessment typically takes place during the final semester of coursework and the purpose of this exam is to measure mathematics content knowledge.

Upon graduation, the program chair will calculate each student's GPA of mathematics content courses as a second measure of mathematics knowledge.

2. To assess Student Learning Outcome #2, students in this advanced program will submit a lesson plan that demonstrates an in-depth understanding of mathematics and theories related to pedagogy and learning and which also reflects a range of instructional strategies and technologies. A lesson plan rubric for measuring this outcome will be provided to candidates in advance of the lesson plan submission.

3. To assess Student Learning Outcome #3, students in this advanced program will complete a project demonstrating knowledge and application of mathematics and pedagogy. The project can take on the form of a curriculum unit to be implemented in the classroom, National Board Certification, or the completion of a mathematics education research project initiated in EDUC 5103. This experience will typically occur during the final semester of coursework and is a part of MATH 5992.

4. To assess Student Learning Outcome #4, the faculty advisor of each candidate will assess teaching. When enrolled in MATH 5992 typically during the last semester of coursework, candidates will teach a lesson which reflects how she/he has applied data driven assessment decisions to teaching so that all students can learn. A teaching evaluation rubric for measuring this outcome will be provided to candidates in advance of the lesson plan submission.

5. To assess Student Learning Outcome #5, students in this advanced program will successfully complete EDUC 5103 [Grade of B or Better] which is an indication of the candidate's ability to analyze educational research and policies and to explain the implications of the research conclusions on their own practice and for the profession.

●Are current outcome data available?

Yes. Transcript data will provide information about successful completion of EDUC 5103 and MATH 5992. Mathematics content GPA summaries are calculated for each student beginning with the Spring 2008 semester. Capstone project assessments are on file in the office of the

Program Chair. The Capstone Exam was written during the Spring 2011 semester with the intention of administering it to students enrolled in MATH 5992 May 2011. Summary data will be collected over time beginning with Spring 2011. Lesson plan and teaching evaluation data collection will begin fall 2011.

●How are the assessment results used to improve student learning?

We have a method for integrating outcome and assessment information into a continuous learning process. Assessment results have resulted in modifications in the program. In some cases, course requirements have been changed. Each fall, faculty involved in the program thoughtfully review assessment results and consider adjustments to the curriculum both with respect to mathematics and pedagogy, to learning outcomes, and to teaching strategies.

Program: M. Ed. Mathematics Education

Report Submitted April 29, 2011

Department Chair: Dr. Darryl Linde

Program Chair: Dr. Martha Parrott

Statement of Intent:

Faculty who teach in the M. Ed. Mathematics Education program remain passionate advocates of this advanced degree and collectively submit this report in support of continued growth and development of a program that has on-going potential for serving K-12 mathematics teachers in Oklahoma as well as surrounding states. This report reflects months of collaborative work among faculty and substantiates progress from fall 2010-2011 with regard to program advancements, potential, and quality.

Purpose:

The purpose of the program is to facilitate the continuing professional development of practicing K-12 mathematics teachers. It is not for the purpose of the initial preparation of teachers. The program consists of four parts: Professional Education Core (15 hours), Mathematics Content Core (9 hours), Guided Electives (9 hours), and a Capstone Experience (2 hours)

In order to meet the diverse professional development needs of practicing K-12 mathematics teachers, the program is flexible. More specifically it meets the needs of teachers who hold bachelor degrees in Secondary Mathematics Education, Mathematics, the sciences, Elementary Education, Early Childhood Education, Special Education, and teachers who have alternative certification. Therefore, the programs rely on strong academic advising that takes into account the current knowledge and skills of program applicants when developing individual degree plans. Courses are offered on a rotating basis. The Master of Education in Mathematics Education program is administered through the College of Science and Health Professions.

Rationale:

After careful review of other advanced programs which provide continuing professional development of practicing K-12 mathematics teachers, we find that the M. Ed. Mathematics Education program offered at NSU is very unique and as such provides meaningful opportunities

for graduate study. Included in our review were programs offered by OSU, Langston, Eastern Oklahoma, Oral Roberts, and Rogers Universities. None of these universities offers a program that would duplicate or compete with our program.

While OSU offers a graduate degree in mathematics education, their 32- hour program is designed as a research-based degree with no more than six hours in courses outside a prescribed list of mathematics courses, a marked difference between the two programs. Hence, the degree at OSU attracts a graduate student different from the one for whom our program is designed. The University of Tulsa does have a program that resembles our program; however, differences in cost per graduate hour suggest that even this program would not challenge our own in terms of student capacity. Hence, neither OSU nor TU are programs that would duplicate or compete with NSU.

Program Capacity:

Currently there are 19 candidates enrolled for spring 2011. [Fall 2010 enrollment was 17.] Historically, our enrollment has exceeded that of our partner program [M. Ed. Science Education] which currently has 13 candidates enrolled for spring 2011. In the absence of 100% online delivery format, we predict that full capacity is 60 with the assumption that the College of Education has the resources to support the professional core component of this degree. An agenda for action as prescribed in this report will suggest ways to move from current enrollment toward full capacity.

Agenda for Action:

With regard to this agenda for action, we are passionately committed to quality curriculum experiences and believe that program quality is a determining factor in program capacity and retention. As such multiple suggestions which include high quality curricular design are addressed here.

1. Program Delivery Format Options:

Our candidates can now gain access to 18 of 35 hours in the degree through online course delivery. Blended and face- to- face options are available as well for those students who have alternate course delivery format preferences. Our intention is to communicate this more aggressively to potential candidates through diverse forms of advertisement and recruitment.

2. Mathematics Course Design Delivery Format:

Faculty in this program have thoughtfully considered the appropriateness of transitioning mathematics courses from a face-to-face format to online and/or blended. While we do not

believe that every math course in the program can maintain our expectations for quality via experiential based learning opportunities through an online course delivery format, we will immediately begin transitioning MATH 5233 Data Analysis to an online course and will adhere to Quality Matters with regard to this transition. Wimba Suite Tools [Voice, Pronto] are resources we will use to enhance the online experience for our students.

Other face-to-face mathematics courses which may be transitioned to online courses include in this order MATH 5273 Geometry and thereafter MATH 5513 Technology in Mathematics Education. Such a transition would provide potentially 9 additional mathematics graduate hours to be partnered with 18 online hours described in item #1 above. Taken together, this transition will provide more options to students.

3. Student Enrollment/ Retention:

a. **Course Delivery:** We anticipate that diverse course delivery formats will positively contribute to program capacity and student retention.

b. **Scholarships:**

- A scholarship has been made available through the Graduate College for the purpose of attracting new students to NSU. After careful review of new candidates for fall 2011, *Sandy Hill* will receive the M. Ed. Mathematics Education scholarship for 2011-2012. Our assumption is that this scholarship can be used for future recruitment beyond the next academic year.

- The *Teach Grant* provides financial support to graduate and undergraduate students who commit to teaching for four years in a Title I school following program completion. This opportunity is not widely known among graduate students, so we will partner with our colleagues in Enrollment Services [Dr. Donna Trout] to communicate this effectively to potential students.

c. **Recruitment:**

- Internal Recruitment: Mathematics modeling faculty will be encouraged to promote this program among our undergraduate elementary, early childhood, and special education students because this graduate program is uniquely designed for individuals with this background who wish to know more and better mathematics and teach effectively at the middle school level.

- External Recruitment: A program brochure will be designed summer 2011 and made available for both internal and external distribution. Program posters and brochures will be mailed to other institutions such as the University of Arkansas, OSU, Langston, Rogers, Eastern Oklahoma and Tulsa Community College to advertise program opportunities.

The university website has made it easy for potential students to access information about our program. However, some minor updates/ modifications will be made to project our most current program information.

We will appreciate administrative recruitment support as contacts are made with multiple community partners and organizations. Additionally we will benefit from marketing budget allocations that will enable us to make contacts with other institutions via published materials.

●**Program Potential:** The State Department of Education in Oklahoma is currently considering the introduction of a new Elementary Mathematics Specialist certification. While the timeframe for the introduction of this certification remains unclear, NSU intends to become a contributing partner in the development process. This could be good news for our program since our M. Ed. Mathematics Education program would seemingly complement a new certification option in Oklahoma and provide candidates with an opportunity to pursue concurrently both a graduate degree and certification.

4. Strengthening Program Quality:

a. **Common Mathematics Experience:** Currently, the only mathematics course common to all candidates is MATH 5992 Capstone. Especially from an NCATE and HLC perspective, this program will be enhanced by requiring a common mathematics course experience for all students.

Because we believe that MATH 5233 Data Analysis is a course that can benefit all our candidates, regardless of background and professional goals, it is our intention to require all students to enroll in this common mathematics course experience. During fall 2011, a proposal will be written for submission to the Curriculum and Educational Policies Committee for approval to modify the degree requirements and the Statement of Understanding. Note that this is also the same course that we are transitioning to an online course.

MATH 5513 Technology in Mathematics Education is a possible option for another common mathematics course experience in our program. Conversations about the appropriateness of requiring this course of all our candidates will take place fall 2011-spring 2012.

b. **Capstone Experience:** During the spring 2011 semester, faculty developed a capstone mathematics content exam to measure student learning outcomes. These

assessment results, along with an on-going analysis of a mathematics course GPA of program completers, will be used to improve program quality, ensure rigor, and support high expectations for student learning.

c. Course Prefix under Consideration: Some of the courses on the degree plan are better suited for those who enter the program with an elementary education background while others are a better fit for high school teachers of mathematics.

Faculty believe program quality and overall program impression will be strengthened by *discouraging* those who merely wish to have a transcript that sports graduate hours in mathematics or who intend to teach at the college level from taking courses originally designed for the candidate with an elementary education background.

In order to match student background appropriately to math course content, faculty are considering the appropriateness of modifying the math course prefix for *only* those courses developed for candidates with elementary certification. One suggestion would be to replace the MATH prefix with an MAED [Math Education].

As a result of this potential change, the degree plan would have both MATH course prefixes and MAED courses prefixes. Through strong and flexible advising, candidates who have a more rigorous mathematics background will be directed toward courses with an MATH prefix while those with an elementary certification background will be directed toward courses with an MAED prefix.

This change will offer a more picturesque view on transcripts of NSU program experiences and as such more clearly communicate to future employers or doctoral programs of choice the type of program experiences are candidates receive.

In summary, we believe that by changing a few of the course prefixes, the program can better communicate purpose. As a result of this potential change, program quality and overall program impression will be strengthened by supporting a good fit between candidates and their background/ professional goals.