

SUNY Potsdam
Program Assessment Plan
Adolescence Mathematics Education, Graduate (MST)

Department Name: Department of Secondary Education

Date Submitted and Academic Year: Assessment Plan for 2011-2012

Department Mission Statement:

The undergraduate Secondary Mathematics education program is located in the Secondary Education Department, which is housed within the School of Education and Professional Studies at SUNY Potsdam. The School has adopted a unit conceptual framework, *A Tradition of Excellence: Preparing Creative and Reflective Educators*, within which the secondary mathematics program functions. Recognizing that the development of professional knowledge, skills and dispositions is essential to the preparation of excellent educators, all unit programs and courses seek so to develop our candidates' attributes as: *Well-Educated Citizens, Reflective Practitioners, and Principled Educators*.

Well-Educated Citizens: In our secondary mathematics program, we seek to develop our candidates' mathematics and general knowledge base and ability to use that knowledge base to critically analyze and solve problems. Faculty members use their current research to support their teaching. Candidates are expected to use media resources wisely and widely to build their professional knowledge base. They are also expected to communicate effectively and correctly in spoken and written language.

Reflective Practitioners: Throughout their programs of study, candidates are exposed to research based models of instruction and assessment, including direct instruction and inquiry-based learning strategies. They demonstrate the ability to effectively select and use technology to facilitate student learning. Throughout the program, they are asked to reflect on their own learning and performance as a way of promoting professional development.

Principled Educators: Our program holds the highest standards for professional behavior among our candidates. They are expected to take responsibility for their actions and well collaboratively with others. Competence, integrity and respect for others are hallmarks of our program graduates and are regularly monitored using our Secondary Education Professional Dispositions Framework, derived from the Principled Educator attributes.

The six NCTM Principles also serve as an organizing conceptual framework for the secondary mathematics education program. Each of the courses in the program addresses one or more of these principles. Students are explicitly shown how the program courses connect with the NCTM Principles.

<u>NCTM Principle</u>	<u>Course(s) addressed</u>
Curriculum	GED 568
Teaching	GED 569, GRED 556, 557
Learning	GED 569, GRED 677
Equity	GED 568, GRED 569, SPED 505
Technology	GED 534
Assessment	GED 569

Faculty Member Completing this Form: Mr. Donald Straight

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Intended Student Learning Outcome #1

Students will demonstrate acceptable levels of content knowledge in Mathematics.

Measurable Criteria and Assessment Method(s)

Direct Assessment #1 – Mathematics Content Specialty Test

The purpose of the Mathematics Content Specialty Test (CST) is to assess knowledge and skills in the following areas:

Sub-area I. Mathematical Reasoning and Communication

Sub-area II. Algebra

Sub-area III. Trigonometry and Calculus

Sub-area IV. Measurement and Geometry

Sub-area V. Data Analysis, Probability, Statistics and Discrete Mathematics

Sub-area VI. Algebra: Constructed-response assignment

The test contains approximately 90 multiple-choice test questions and one constructed-response (written) assignment. The table below illustrates the approximate percentage of the test corresponding to each sub-area.

Direct Assessment #2 – Mathematics major course grades

Mathematics Major Required Course(s)	NCTM Standards, Indicators
Calculus core (Calc I, II, Multivariate Calc)	1.1, 1.2, 1.3, 1.4, 2.1, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 5.1, 5.1, 5.3, 6.1, 9.6, 10.1, 10.4, 12.1, 12.2, 12.3, 12.4
Set Theory and Logic	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.3
Linear Algebra I	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 5.3, 9.9, 10.2, 10.4
Modern Algebra I	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.3, 5.3, 9.1, 9.5, 10.1, 10.3, 10.4
Advanced Calculus I	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.3, 5.3, 9.2, 9.6, 9.7, 12.1
Problem Seminar	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3
Geometry (MATH 404, 553, or equivalent)	11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7
Applied Combinatorics (cognate requirement)	2.2, 4.1, 4.2, 5.1, 5.3, 13.1, 13.2
Probability and Statistics (cognate requirement)	1.1, 1.2, 4.2, 4.3, 5.2, 6.1, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7

Note: Approved by SUNY Potsdam Department of Mathematics, April 20, 2006.

(Please see details of these two direct assessment measures, and information about the sources of the data, on the following page.)

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Sources of Data for Intended Student Learning Outcome #1

Direct Assessment #1 – Mathematics Content Specialty Test

The primary content measure in the New York State Teacher Certification Examination for Mathematics Adolescence Education (7-12) is the Content Specialty Test (CST): Mathematics, one of three presently required exams taken by Secondary Mathematics Education majors as part of their Initial Certification process; they must pass it to qualify for certification.

In consultation with their Mathematics major and Education advisors, most candidates take the test during their final semester on campus prior to student teaching, or during a student teaching placement. If they do not achieve a passing score, candidates may re-take the exam. We assess candidates both on their overall score and on their scores in the six sub-areas.

Direct Assessment #2 – Mathematics major course grades

This assessment examines candidate grades in the required Mathematics courses in the SUNY Potsdam Bachelor of Arts Mathematics major. Successful applicants to the MST program in Adolescence Mathematics Education have a 2.75 grade point average in their mathematics coursework; most candidates also complete prerequisite courses mathematics concurrent with their education studies. The courses that are included in this assessment include all the required Mathematics major courses – or their equivalents – and the two required cognates in the undergraduate program: Probability & Statistics and Applied Combinatorics.

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Intended Student Learning Outcome #2

Students will demonstrate effective planning of classroom-based instruction.

Measurable Criteria and Assessment Method(s)

Direct Assessment #1 – Instructional Planning Assignments

Lesson Plan Component 2011-12	Course Assignments			Standards		
	GRED 534	GRED 568	GRED 569	INTASC	SUNY Potsdam Conceptual Framework	NCTM
Presentation well organized	✓	✓	✓	7	RP	3.3
Ideas well communicated	✓	✓	✓	6	RP	3.1, 3.2
Unit plan context	✓	✓		7	RP	7.2, 8.1, 8.4
Goals and objectives	✓		✓	7	RP	8.4
Goals (general outcomes)		✓		7	RP	8.4
Objectives (clearly stated, specific, measurable)		✓		7	RP	8.4
NYS Learning Standards identified		✓	✓	7	RP	8.4
Materials	✓	✓	✓	4, 7	RP	8.1, 8.2
Motivation	✓	✓	✓	2, 3, 7	RP	7.1, 7.2, 8.1
Lesson procedure	✓	✓	✓	4	RP	7.3, 8.4, 8.7
Focus on concept development		✓		4	RP	8.8
Inductive – Launch			✓	4	RP	8.7, 8.8
Inductive – Explore			✓	4	RP	8.7, 8.8
Inductive – Share			✓	4	RP	8.7, 8.8
Inductive – Summarize			✓	4	RP	8.7, 8.8
Closure activity	✓	✓	✓	4	RP	7.3, 8.7
Extension activity		✓	✓	4	RP	7.3, 8.7
Assessment activity	✓	✓	✓	8	RP	7.5, 8.3
Integration of technology	✓			6	RP	6.1, 7.6, 8.9

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Direct Assessment #2 – Teaching Portfolios

Portfolio Category	INTASC Principle	SUNY Potsdam Conceptual Framework	NCTM Standards and Indicators
1. Content Knowledge	1	WEC	1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15
2. Human Development	2	WEC, RP	8.1, 8.2
3. Diversity	3		7.1, 8.1
4. Instructional Strategies	4	RP	8.7, 8.8
5. Learning Environment	5	RP	7.3
6. Communication	6		6.1, 7.6, 8.9
7. Planning for Instruction	7	RP	7.2, 8.4, 8.7
8. Assessment	8	RP	7.5, 8.3
9. Reflection and Growth	9	RP, PE	8.5, 8.6
10. Relationships	10	PE	7.3

Sources of Data for Intended Student Learning Outcome #2

Direct Assessment #1 – Instructional Planning Assignments

Students complete three instructional planning assignments in three different, required program courses, as shown in the following table:

Course	Assignment Name	Focus
GRED 534	Technology lesson plan	This plan demonstrates the candidate's ability to create a lesson plan that integrates technology effectively and appropriately.
GRED 568	Lesson plan development	This plan demonstrates the candidate's ability to create a teacher-directed lesson to emphasize concept development on the part of the students, while also considering the unit context.
GRED 569	Microteaching assignment	This assignment demonstrates the candidate's ability to create an inquiry-based lesson plan, and a teacher-directed lesson plan, on a specified conceptual topic in an appropriate curriculum level.

Direct Assessment #2 – Teaching Portfolios

Candidates develop a professional teaching portfolio (aligned with the 10 INTASC Principles) over the course of their time in the Mathematics Education program. Candidates begin their portfolio in the first mathematics methods course (GRED 568), and then continue to add artifacts and refine their portfolio in the second mathematics methods course (GRED 569) and throughout their student teaching placements.

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Intended Student Learning Outcome #3

Students will demonstrate pedagogical and professional knowledge, skills and dispositions.

Measurable Criteria and Assessment Method(s)

This intended learning outcome is assessed during the student teaching experience, generally completed in the final semester before a student graduates. Student teaching consists of two eight-week placements, one in middle school and one in secondary school. The items listed below are used by the student (for self-assessment), the regional school sponsor teacher, and the SUNY Potsdam supervisor; results are then discussed to determine consensus in evaluative triad meetings, which are held at week 4 and week 8 of each placement.

Mathematics criteria within Principle 1

- Demonstrates solid knowledge and understanding of mathematical content
- Integrates a variety of appropriate resources into lessons, and effectively integrates multiple representations (symbolic, graphical, numerical, verbal)
- Uses interdisciplinary approaches to teaching content (uses examples from a variety of disciplines and selects content to encourage diverse perspectives)
- Engages students in mathematical reasoning
- Makes mathematical connections between key ideas
- Engages students in inquiry-based (inductive) learning

Mathematics criteria within Principle 2

- Lessons appropriate for students and topic (ties activities to student abilities, prior knowledge, and backgrounds)
- Sensitive to developmental characteristics of students
- Integrates individual, small group, and full class activities
- Sets clear and appropriate expectations for learning and achievement, and develops student responsibility for their own learning
- Integrates progressive questioning and discussion techniques
- Invites students' self reflection and self-monitoring of learning

Mathematics criteria within Principle 3

- Identifies and adapts to individual learning abilities (adapts teaching methods and lessons to meet individual student needs)
- Selects resources to meet range of individual needs (special education-gifted)
- Creates a learning community that respects individual differences
- Integrates a variety of teaching and assessment modes
- Uses methods that speak to diverse student experiences
- Connects multicultural curricula to diversity among students; triangulates concepts from a variety of cultural perspectives

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Mathematics criteria within Principle 4

- Utilizes best practices: multiple teaching strategies, active learning, and modeling; assumes varying roles as needed
- Reflects on and adjusts strategies to achieve learning goals
- Models appropriate teacher-student role in instructional processes
- Integrates a good variety of activity-based teaching and learning strategies to encourage critical thinking and problem solving; evaluates the effects of various activities on both individuals and the class as a whole
- Uses a variety of teacher interactions and involvement
- Reviews conceptual goals prior to the start of a new unit; teaches from a thematic web of concepts

Mathematics criteria within Principle 5

- Effectively organizes, allocates, and manages class time, transitions and materials in ways that are conducive to learning
- Gives clear directions and procedures
- Uses appropriate content and activity pacing
- Creates a positive climate for learning (supports intrinsic motivation and students taking individual and collective responsibility for their learning)
- Establishes clear expectations for appropriate student behavior; monitors and responds appropriately
- Creates a harmonious learning community in the classroom (helps develop shared understanding and expectations)
- Engages students in cooperative learning strategies, allowing for full and varied participation of all individuals during independent and group work
- Effectively manages classroom space and performs non-instructional duties effectively (e.g. attendance, paper distribution, homeroom, etc.)
- Monitors and adjusts to the classroom environment and interactions, including student motivation and involvement; maintains productivity

Mathematics criteria within Principle 6

- Uses oral and written language effectively; explains concepts clearly and correctly, modeling effective communication strategies
- Uses media and technology tools in appropriate ways to enrich learning opportunities and enhance concept understanding
- Asks appropriate and high quality questions and listens carefully to student responses
- Supports and develops appropriate student expression, and also student-to-student interaction in class discussions
- Models development of listening skills
- Demonstrates an understanding that much communication is non-verbal, and makes use of this knowledge to foster a communicative environment

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Mathematics criteria within Principle 7

- Develops and selects purposeful learning activities based on effective instructional techniques, aligned with district curriculum and essential skills
- Exhibits solid short- and long-term planning (includes lesson and unit plans)
- Lesson plans are monitored and adjusted as necessary in response to unanticipated events and student needs
- Plans lessons and activities to address a variety of learning styles and performance modes, diversity of learners, and problem solving approaches
- Details of lesson procedure are well-prepared and rehearsed
- Values planning as a collegial activity

Mathematics criteria within Principle 8

- Selects, constructs and uses a variety of formal and informal assessment strategies appropriate to the learning objectives to gauge student progress
- Uses student assessment data in lesson planning, monitoring, and adjustment (aware if students are engaged and on-task)
- Evaluates students' progress and performances (records and monitors assessment data)
- Communicates student progress knowledgeably and responsibly
- Assesses a variety of skills and abilities through varied student contacts
- Uses strategies to engage students in self-assessment, and encourages them to assume full responsibility for seeking out and using available learning resources

Mathematics criteria within Principle 9

- Uses classroom observation, student assessment, professional research and organizations, and colleagues to evaluate teaching and learning practice, to develop as a continuous learner, and to experiment with and revise practice
- Reflects deeply on teaching (written journal and conversations)
- Values and exhibits critical thinking and self-directed learning; appears receptive to suggestions and feedback
- Sensitive to needs of students and sponsor; accepts appropriate responsibility for student performance
- Exhibits cooperative, reliable and organized professional behavior
- Consults with colleagues within the school and in other professional arenas to support reflection and problem-solving and to generate new ideas

Mathematics criteria within Principle 10

- Participates in school events and projects with goal of building relationships and making the entire school a productive learning environment
- Talks with and listens to students (sensitive to student needs and aware of community resources); advocates appropriately for them
- Investigates problem situations and seeks outside help as needed and appropriate
- Communicates with counselors, other teachers, and community professionals to support student learning and well-being
- Exhibits respectful and productive communication with families (seeks cooperative partnerships with parents/guardians to support student learning)
- Develops and maintains positive relationships with colleagues, and seeks to develop cooperative partnerships with other professionals to enrich the classroom learning environment

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Sources of Data for Intended Student Learning Outcome #3

This assessment (historically referred to at SUNY Potsdam as “Form 5”) is the major assessment instrument for evaluating candidates’ overall performance during their student teaching placements. The Secondary Mathematics Form 5 assessment consists of over 50 items organized using the 10 INTASC Principles, covering areas ranging from Content Knowledge to Collaborative Relationships, as shown above; these items are cross-referenced to the applicable NCTM standards.

Intended Student Learning Outcome #4

Teacher candidates will demonstrate effects on student learning.

Measurable Criteria and Assessment Method(s)

Direct Assessment #1 – Teacher Work Sample

Teacher Work Sample Component	INTASC Principle	SUNY Potsdam Conceptual Framework	NCTM SPA Standard / Indicator
1. Contextual Factors	3	RP	7.1
2. Learning Goals / Objectives	7	RP	8.4, 16.3
3. Assessment Plan	8	RP	7.5, 8.3, 16.3
4. Design for Instruction	3, 4	RP	8.1, 8.2, 8.4, 8.9, 16.3
5. Instructional Decision-Making	4, 9	RP	7.3, 8.7, 16.3
6. Analysis of Student Learning	8	RP	7.3, 7.4, 8.3, 16.3
7. Reflection and Self-Evaluation	8, 9	RP	7.3, 16.3

Direct Assessment #2 – Classroom Management Plan

Classroom Management Plan Component	INTASC Principle	SUNY Potsdam Conceptual Framework	NCTM SPA Standard / Indicator
Presentation well organized	6	WEC	3.1
Ideas well communicated	6	WEC, RP	3.1
Seating arrangement	5	RP	7.3
Homework system	4, 7	RP	7.3
First day / positive environment	5	RP	7.1, 7.3
Class rules / communication / vision of classroom	5	RP	7.1, 7.3
Monitoring students’ understanding	8	RP	7.4, 7.5, 8.3
Integration of cooperative learning	4	RP	7.3, 8.6
Class absence / tardiness policies	5	RP	7.3
Comprehensive plan	5	WEC, RP	7, 8
High quality plan, clearly articulated	5, 6	WEC, RP	7, 8

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Sources of Data for Intended Student Learning Outcome #4

Direct Assessment #1 – Teacher Work Sample

The Teacher Work Sample assignment was created to provide an opportunity for teacher candidates to provide credible evidence of their ability to facilitate student learning by: using information about the learning-teaching context and student individual differences to set learning goals and plan instruction and assessment; setting significant, challenging, varied, and appropriate learning goals; using multiple assessment modes and approaches aligned with learning goals to assess student learning before, during, and after instruction; designing instruction for specific learning goals, student characteristics and needs, and learning contexts; using regular and systematic evaluations of student learning to make instructional decisions; using assessment data to profile student learning and communicate information about student progress and achievement; and reflecting on his or her instruction and student learning in order to improve teaching practice. The TWS assignment is completed during one of the two student teaching placements, and is evaluated by the college supervisor.

Direct Assessment #2 – Classroom Management Plan

Candidates in the second mathematics methods course (GRED 569) are asked to develop a detailed Classroom Management Plan (CMP) that addresses such topics as classroom seating arrangement, classroom rules, and homework system. Candidates are expected to provide full justifications for their responses. Classroom management issues are discussed at length in the GRED 569 course, and this assignment affords students an opportunity to reflect on and commit to their own particular approaches to these issues.

Summary of Action Plans for 2011-12

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| 1. Continue to gather data for existing assignments described in this document, analyzing student performance in an ongoing, continuous manner. |
| 2. In consultation with regional school partners, modify – as appropriate – assignments and rubrics to maintain relevance to direct classroom usefulness. |
| 3. As much as possible, intertwine classroom assignments, both those specified in this assessment plan and others, with the companion field experiences to build in a discrete connection between theoretical discussions and practical reality. |
| 4. Encourage a higher level of extra-classroom involvement by student candidates during both field experiences and student teaching placements; this is a common area of challenge in evaluation. |
| 5. Keep comments relating to professional appearance and interaction current; that is, through field associations, keep fingers “on the pulse” of issues with which employed teachers deal, and integrate those into campus classroom conversations. |
| 6. Use (limited) alumni contacts to provide feedback on areas where program improvement could benefit present and future students. |