

**Program Report for the  
Preparation of Secondary Mathematics Teachers  
National Council of Teachers of Mathematics (NCTM)**

**NATIONAL COUNCIL FOR ACCREDITATION OF TEACHER EDUCATION**

**C O V E R   S H E E T**

**Institution** Howard University **State** Washington, DC

**Date submitted** 02-01-2008

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**Program documented in this report:**

**Name of institution's program (s)** Mathematics Education

**Grade levels for which candidates are being prepared** 7-12

**Degree or award level** \_\_\_\_\_

**Is this program offered at more than one site?**  Yes  No

If yes, list the sites at which the program is offered \_\_\_\_\_

**Title of the state license for which candidates are prepared**

Mathematics 7-12

**Program report status:**

**Initial Review**

**Response to a Not Recognized Decision**

**Response to National Recognition With Conditions**

**Response to a Deferred Decision**

**State licensure requirement for national recognition:**

NCATE requires 80% of the program completers who have taken the test to pass the applicable state licensure test for the content field, if the state has a testing requirement. Test information and data must be reported in Section III. Does your state require such a test?

**Yes**

**No**

## SECTION I—CONTEXT

### Section I -- CONTEXT NARRATIVE

#### **1. Description of any state or institutional policies that may influence the application of NCTM standards**

The approved undergraduate and graduate Secondary Education Programs in Mathematics is aligned with the District of Columbia standards for certification and licensing and with the National Council of Teachers of Mathematics (NCTM) standards. The certification and license permits teachers to teach general and advanced placement courses in mathematics in grades 7 through 12.

#### **2. Description of the field and clinical experience required for the program, including the number of hours for early field experiences and the number of hours/weeks for student teaching and internships**

Field experiences provide candidates with a variety of observational and hands-on experiences that help them understand and appreciate the connection between theory and practice. A beginning field experience is arranged in each course prior to the candidate's methods course. An "observation and participation" takes place during the methods course, and an advanced experience occurs during internship or clinical practice. The nature and length of the experiences differ as candidates matriculate through the program, increasing in intensity and length of time spent in the field.

#### **Beginning Field Experiences**

Beginning with the first course, *Introduction to Teacher Education (SEED 001 for undergraduates and EDUC 289 for graduates)*, field experiences are arranged for candidates. These initial field experiences include observations of teaching and learning in middle and high schools. Candidates spend at least 10 hours in the field. Candidates may recommend a school site where they would like to conduct their observations; however, the final assignment is made by the Director of Teacher Education. During this course, candidates begin to create and gather artifacts for their professional portfolio. Some of these artifacts include a personal educational philosophy and initial reflections about teaching and learning in urban settings with students from diverse backgrounds and with diverse learning needs.

As the undergraduate and graduate candidates matriculate through the pre-methods courses, the foci of the field experiences are aligned with the goals of the individual courses. For example, in *Introduction to Teacher Education*, candidates are asked to reflect on which educational philosophy or combination of philosophies (i.e., perennialism, progressivism, existentialism, social constructivism) are implicitly or explicitly manifested at their observation site. Candidates are encouraged to develop skill in evaluating the extent to which their own personal educational philosophy matches the setting in which they are placed. The development of these skills as a *reflective practitioner* will be useful when they apply for a teaching position. In *Introduction to Assessment and Measurement in Teaching (EDUC 224)*, graduate candidates must administer a mathematics assessment to a student, analyze the results, and design an instructional program

based on the results. This field experience helps candidates appreciate the important roll that classroom assessment plays in the teaching/learning process. In *Research in Curriculum and Teaching (EDUC 379)*, graduate candidates are asked to interview an editor of an educational research journal to learn how manuscripts progress through review and publication process. Interviews are conducted with faculty members in the School of Education who serve as editors of peer-reviewed educational research journals. This field experience demonstrates to candidates how they, too, can contribute to the body of educational research as they develop into *competent researchers*. In all, candidates spend approximately 50 hours in field experiences prior to enrolling in their mathematics methods course.

### **“Observation and Participation” Field Experiences: Evidence for meeting NCTM Indicator 16.1**

The observation and participation field experiences take place when undergraduate and graduate candidates are enrolled in the course, *Teaching Mathematics in Junior and Senior High Schools (SEED 198 for undergraduates and EDUC 198 for graduates)* during the fall semester of the year. All candidates are in the field (placed in a classroom) for at least two half-days per week for 10 weeks.

The methods course is usually taken the semester before clinical practice or internship. The accompanying field experience -- referred to as “Observation and Participation (O&P)” -- takes place either in middle school or high school setting. If the candidate is placed in a middle school for O&P, then the placement for the clinical practice field experience is in a high school.

Candidates are supported by a cooperating teacher, a university faculty supervisor, and the Director of Teacher Education. The Director of Teacher Education locates an appropriate placement, taking into consideration the candidate’s interests and preferences. Candidates observe the cooperating teacher teaching and assist the teacher by participating in individual or group instruction. Gradually, the candidate is integrated into the teaching process and is scheduled to teach two lessons – preferably focusing on two different mathematics content standards. During the teaching of the lesson, the university faculty supervisor and the cooperating teacher observe and evaluate the candidate’s performance. Each observation is followed immediately by a meeting with the candidate during which time feedback on the performance is provided to the candidate. Areas of weakness that are identified during the first observation are expected to show improvement during the second observation.

Undergraduate and graduate candidates also attend a District of Columbia Teachers of Mathematics (DCCTM) meeting during the fall semester in which they are in O&P. They are accompanied to the meeting by faculty supervisors from Departments of Curriculum & Instruction.

### **Clinical Practice Field Experience: Evidence for meeting NCTM Indicator 16.2**

The clinical practice field experience is approximately 7 hours per day for 15 weeks during a 16-week semester or 525 hours plus an additional 20-hour on campus seminar in *Student Teaching*

(SEED 135 for undergraduates and Internship -- EDUC 296 and EDUC 297 for graduate candidates).

During clinical practice, undergraduate and graduate candidates are at the school site on a full-time basis. This experience provides candidates an opportunity to engage in a variety of teaching experiences including planning instruction, implementing instruction, assessing student learning, communicating student progress with students and their parents/guardians, collaborating with other educational professionals, and participating in professional development activities. Candidates begin full-time teaching approximately five weeks after they begin their student teaching experience. Candidates are observed formally two times by the cooperating teachers and a minimum of three times by the university faculty supervisor. Two of the observations by the university faculty supervisor are planned, and one observation is unannounced.

Candidates who are enrolled in the unit's alternative certification program complete their clinical practice as full-time teachers under the supervision of a qualified mentor teacher and the administrative leadership team of the school in which they are employed. These candidates experience one school-year of supervised on-the-job clinical practice.

**3. Description of the criteria for admission, retention, and exit from the program, including required GPAs and minimum grade requirement for the content courses accepted by the program:**

The criteria for admission, retention, and exit depends on whether the candidate is pursuing initial certification in (a) the undergraduate secondary education professional minor program (and a major in mathematics), (b) the Master of Arts in Teaching program, or (c) the Alternative Certification Program (ACP), *Transition to Teaching*.

Candidates are assessed at key transitions points in their respective programs in order to ensure that they are qualified to advance to the next level of the program. A candidate who does not meet the criteria is notified of his/her failure to meet the criteria and is offered assistance to remedy the situation. A candidate may be given additional time, advised out of the program or dismissed from the program if the remediation efforts are not successful.

Undergraduate Secondary Education Professional Minor (30 Credits)

**Admission:** To be admitted to the undergraduate secondary education professional minor, a candidate must pass all parts of Praxis I (reading, writing, mathematics), have a cumulative grade point average of 2.3 (4.0 scale), and a grade point average of 2.5 (4.0 scale) in their mathematics and education courses. Additionally, only education courses with a grade of "C" or better are accepted -- with the exception of the content methods course and the Student Teaching and Classroom Management seminar course, SEED 135.

**Retention:** To be retained in the undergraduate professional minor program, a candidate has to maintain good academic standing in the College of Arts & Sciences (COAS) and a minimum of grade "C" in all courses prior to taking the methods course, and a grade of "B" in methods

(SEED 198) and student teaching (SEED 135). Candidates must also pass all parts of the Praxis I examination, earning at least the minimum score set for each test by the District of Columbia.

**Exit:** In order to exit the program, a candidate must be recommended for certification. Not all candidates who graduate from the College of Arts and Sciences with a major in mathematics and began the secondary education professional minor program during their matriculation actually “exit” the program. Beginning in Spring Semester 2005, all candidates exiting the program had to complete *all* 30 credits hours of the *professional minor program*, receive a minimum grade of “B” in Student Teaching (SEED 135), pass the content pedagogy, and proofs tests of Praxis II in mathematics, and earn satisfactory marks on his/her professional portfolio.

#### Master of Arts in Teaching (M.A.T.) Program (36 Credit Hours)

**Admission:** To be admitted to the Master of Arts in Teaching (MAT) Secondary Education Program, a candidate must pass all parts of Praxis I (reading, writing, mathematics), have 3 satisfactory recommendations that speak to the candidate’s potential to be successful in a graduate program, a personal statement of the candidate’s interest in teaching, a biographical sketch, a minimum overall grade point average of 2.7, a completed graduate application, and the equivalent of at least 18 hours in mathematics coursework beyond college algebra (or have a plan to complete the coursework).

**Retention:** To be retained in the MAT Secondary Education Program, a candidate must maintain good academic standing (3.0 on a 4.0 scale) in the School of Education and a minimum of grade “B” in the methods course, *Teaching Mathematics in Junior and Senior High School (EDUC 198)*. A candidate must also demonstrate progress toward completing the minimum number of credit hours in mathematics content course, if applicable.

**Exit:** In order to exit the program, a candidate must be recommended for certification. A candidate must pass three (3) Praxis II tests: (1) Mathematics Content Knowledge, (2) Proofs and Models, and (3) Mathematics Pedagogy. They must also earn a passing score on the Department of Curriculum & Instruction’s master’s comprehensive examination, earn satisfactory marks on his/her professional portfolio and action research paper, and earn a minimum grade of “B” in *Internship (EDUC 296 & 297)*,

#### Alternative Certification Program in Mathematics

**Admission:** To be admitted to the Alternative Certification Program a candidate must earn passing scores in Praxis I (reading, writing, mathematics) and Praxis II (mathematics content knowledge). All other criteria are the same as that for admission to the M.A.T. Secondary Education Program.

**Retention:** See information for MAT Secondary Education Program above.

**Exit:** In order to exit the program, a candidate must be recommended for certification. Upon satisfactory completion of required coursework and a one school-year satisfactory supervised internship, a candidate is recommended for certification.

**4. Description of the relationship of the program to the unit’s conceptual framework:**

The criteria for admission, retention, and exit depends on whether the candidate is pursuing initial certification in (a) the undergraduate secondary education professional minor program (and a major in mathematics), (b) the Master of Arts in Teaching program, or (c) the Alternative Certification Program (ACP), *Transition to Teaching*.

Candidates are assessed at key transitions points in their respective programs in order to ensure that they are qualified to advance to the next level of the program. A candidate who does not meet the criteria is notified of his/her failure to meet the criteria and is offered assistance to remedy the situation. A candidate may be given additional time, advised out of the program or dismissed from the program if the remediation efforts are not successful.

Undergraduate Secondary Education Professional Minor (30 Credits)

**Admission:** To be admitted to the undergraduate secondary education professional minor, a candidate must pass all parts of Praxis I (reading, writing, mathematics), have a cumulative grade point average of 2.3 (4.0 scale), and a grade point average of 2.5 (4.0 scale) in their mathematics and education courses . Additionally, only education courses with a grade of “C” or better are accepted -- with the exception of the content methods course and the Student Teaching and Classroom Management seminar course, SEED 135.

**Retention:** To be retained in the undergraduate professional minor program, a candidate has to maintain good academic standing in the College of Arts & Sciences (COAS) and a minimum of grade “C” in all courses prior to taking the methods course, and a grade of “B” in methods (SEED 198) and student teaching (SEED 135). Candidates must also pass all parts of the Praxis I examination, earning at least the minimum score set for each test by the District of Columbia.

**Exit:** In order to exit the program, a candidate must be recommended for certification. Not all candidates who graduate from the College of Arts and Sciences with a major in mathematics and began the secondary education professional minor program during their matriculation actually “exit” the program. Beginning in Spring Semester 2005, all candidates exiting the program had to complete *all* 30 credits hours of the *professional minor program*, receive a minimum grade of “B” in Student Teaching (SEED 135), pass the content pedagogy, and proofs tests of Praxis II in mathematics, and earn satisfactory marks on his/her professional portfolio.

Master of Arts in Teaching (M.A.T.) Program (36 Credit Hours)

**Admission:** To be admitted to the Master of Arts in Teaching (MAT) Secondary Education Program, a candidate must pass all parts of Praxis I (reading, writing, mathematics), have 3 satisfactory recommendations that speak to the candidate’s potential to be successful in a graduate program, a personal statement of the candidate’s interest in teaching, a biographical

sketch, a minimum overall grade point average of 2.7, a completed graduate application, and the equivalent of at least 18 hours in mathematics coursework beyond college algebra (or have a plan to complete the coursework).

**Retention:** To be retained in the MAT Secondary Education Program, a candidate must maintain good academic standing (3.0 on a 4.0 scale) in the School of Education and a minimum of grade “B” in the methods course, *Teaching Mathematics in Junior and Senior High School (EDUC 198)*. A candidate must also demonstrate progress toward completing the minimum number of credit hours in mathematics content course, if applicable.

**Exit:** In order to exit the program, a candidate must be recommended for certification. A candidate must pass three (3) Praxis II tests: (1) Mathematics Content Knowledge, (2) Proofs and Models, and (3) Mathematics Pedagogy. They must also earn a passing score on the Department of Curriculum & Instruction’s master’s comprehensive examination, earn satisfactory marks on his/her professional portfolio and action research paper, and earn a minimum grade of “B” in *Internship (EDUC 296 & 297)*,

#### Alternative Certification Program in Mathematics

**Admission:** To be admitted to the Alternative Certification Program a candidate must earn passing scores in Praxis I (reading, writing, mathematics) and Praxis II (mathematics content knowledge). All other criteria are the same as that for admission to the M.A.T. Secondary Education Program.

**Retention:** See information for MAT Secondary Education Program above.

**Exit:** In order to exit the program, a candidate must be recommended for certification. Upon satisfactory completion of required coursework and a one school-year satisfactory supervised internship, a candidate is recommended for certification.

#### **5. Indication of whether the program has a unique set of program assessments and the relationship of the program’s assessments to the unit’s assessment system:**

The Secondary Education Mathematics Program has several assessments that are unique to the program. Examples of assessments that are aligned with one or more of the afore-mentioned candidate outcomes (in parenthesis) include: lesson and unit plans (2, 3), parent newsletters (5), the Mathematics Senior Comprehensive Examination which is administered by the Department of Mathematics (1,2), Praxis I and Praxis II (1,2), Teacher Candidate Assessment Instrument (3,4,7), and an action research project (4). (See #4 above).

All of the afore-mentioned unique program assessments and the associated candidate outcomes are aligned with the conceptual framework that guides the work of the Unit and serves as the basis of the Unit’s assessment system.

Department of Mathematics --- College of Arts & Sciences -- Howard University

**MATHEMATICS MAJOR – EDUCATION TRACK**

FRESHMAN YEAR

First Semester			Second Semester		
Department	Course #	Credits	Department	Course #	Credits
Calculus I	MATH156	4	Calculus II	MATH157	4
Proofs & Problems	MATH101	1	Proofs & Problems	MATH102	1
English	002	3	English	003	3
Intro to Teacher Ed	SEED001	3	Physical Education		1
Division A*		3	Computer Science	135	4
Division A		3	Education Psych	SEED029	3
Freshman Orientation	001	1			
<b>Total Credits</b>		<b>18</b>			<b>16</b>
<b>Cumulative Total</b>		<b>18</b>			<b>34</b>

SOPHOMORE YEAR

First Semester			Second Semester		
Department	Course #	Credits	Department	Course #	Credits
Calculus III	MATH158	4	Intro to Linear Alg	MATH180	4
Discrete Structures	MATH181	3	Soc Foundations of		
Survey of Exceptional Child	SEED150	3	Urban Ed	SEED039	3
Foreign Language		4	Philosophy		3
Physical Education		1	Foreign Language		4
Division A		3	Physical Education		1
<b>Total Credits</b>		<b>18</b>	Speech (HUCO)	101	3
<b>Cumulative Total</b>		<b>52</b>			<b>18</b>
					<b>70</b>

JUNIOR YEAR

First Semester			Second Semester		
Department	Course #	Credits	Department	Course #	Credits
Modern Geometry	MATH150	3	Intro to Analysis	MATH195	3
Reading in Secondary			Division B		3
Schools	SEED160	3	Division D		3
Division B*		3	English (writing)		3
Division D		3	Foreign Language		3
Foreign Language		1	Intro to Ed Tech	SEED110	3
Physical Education		3			
<b>Total Credits</b>		<b>16</b>			<b>18</b>
<b>Cumulative Total</b>		<b>86</b>			<b>104</b>

SENIOR YEAR

First Semester			Second Semester		
Department	Course #	Credits	Department	Course #	Credits
Probability & Stats	MATH189	3	Math Elective		3
Teaching Math	SEED198	3	Student Teaching	SEED135	9
		3	Division C		3
Division C		3			
Division A		3			
<b>Total Credits</b>		<b>15</b>			<b>15</b>
<b>Cumulative Total</b>		<b>119</b>			<b>134</b>

**September 2005**

**In addition, the Praxis I exam should be taken by the end of the sophomore year and the Praxis II exam must be taken before doing student teaching. Students should complete one of their divisional requirements within the African-American course cluster.**

## SECTION II— LIST OF ASSESSMENTS

In this section, list the 6-8 assessments that are being submitted as evidence for meeting the NCTM standards. All programs must provide a minimum of six assessments. If your state does not require a state licensure test in the content area, you must substitute an assessment that documents candidate attainment of content knowledge in #1 below. For each assessment, indicate the type or form of the assessment and when it is administered in the program.

	<b>Name of Assessment<sup>1</sup></b>	<b>Type or Form of Assessment<sup>2</sup></b>	<b>When the Assessment Is Administered<sup>3</sup></b>
1	<b>[Licensure assessment, or other content-based assessment]</b> Praxis II : Content & Proofs, Models, and Problems	State Licensure Test	Completion of Program (Minors & MAT) Admission to Program (Alternative Cert)
2	<b>[Assessment of content knowledge in mathematics]</b> College of Arts & Sciences Senior Exam & Grades in Math Courses	Mathematics Senior Comprehensive Exam (Minors) Grades (M.A.T. and Alternative Cert)	Completion of Program (Minors) Admission to Program (MAT & AC)
3	<b>[Assessment of candidate ability to plan instruction]</b> Unit Plan	*Written plans	During content methods course, <i>Teaching Math in Jr &amp; Sr High Schs (SEED 198 or EDUC 198)</i>
4	<b>[Assessment of student teaching]</b> Teacher Candidate Evaluation Instrument	*Student Teaching Performance Evaluation	During Student Teaching (Minors) and Internship (MAT & AC).
5	<b>[Assessment of candidate effect on student learning]</b> Action Research Project	*Research Paper	Student Teaching (Minors) Internship (MAT & AC)
6	<b>Additional assessment that addresses NCTM standards (required)</b> Professional Portfolio	*Portfolio	Completion of Program
7	<b>Additional assessment that addresses NCTM standards (optional)</b> Praxis II: Pedagogy	State Licensure Test	Completion of Program
		* Assessed with Departmental Rubric	

<sup>1</sup> Identify assessment by title used in the program; refer to Section IV for further information on appropriate assessment to include.

<sup>2</sup> Identify the type of assessment (e.g., essay, case study, project, comprehensive exam, reflection, state licensure test, portfolio).

<sup>3</sup> Indicate the point in the program when the assessment is administered (e.g., admission to the program, admission to student teaching/internship, required courses [specify course title and numbers], or completion of the program).

**SECTION III—RELATIONSHIP OF ASSESSMENT TO STANDARDS**

For each NCTM standard on the chart below, identify the assessment(s) in Section II that address the standard. One assessment may apply to multiple NCTM standards.

<b>NCTM STANDARD</b>	<b>APPLICABLE ASSESSMENTS FROM SECTION II</b>
<b>Mathematics Preparation for All Mathematics Teacher Candidates</b>	
<b>1. Knowledge of Problem Solving.</b> Candidates know, understand and apply the process of mathematical problem solving. [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a> ]	X#1 X#2 <input type="checkbox"/> #3 <input type="checkbox"/> #4 <input type="checkbox"/> #5 <input type="checkbox"/> #6 <input type="checkbox"/> #7 <input type="checkbox"/> #8
<b>2. Knowledge of Reasoning and Proof.</b> Candidates reason, construct, and evaluate mathematical arguments and develop an appreciation for mathematical rigor and inquiry. [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a> ]	X#1 X#2 <input type="checkbox"/> #3 <input type="checkbox"/> #4 <input type="checkbox"/> #5 <input type="checkbox"/> #6 <input type="checkbox"/> #7 <input type="checkbox"/> #8
<b>3. Knowledge of Mathematical Communication.</b> Candidates communicate their mathematical thinking orally and in writing to peers, faculty and others. [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a> ]	X#1 X#2 <input type="checkbox"/> #3 X#4 X#5 <input type="checkbox"/> #6 <input type="checkbox"/> #7 <input type="checkbox"/> #8
<b>4. Knowledge of Mathematical Connections.</b> Candidates recognize, use, and make connections between and among mathematical ideas and in contexts outside mathematics to build mathematical understanding. [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a> ]	X#1 X#2 <input type="checkbox"/> #3 X#4 X#5 <input type="checkbox"/> #6 <input type="checkbox"/> #7 <input type="checkbox"/> #8
<b>5. Knowledge of Mathematical Representation.</b> Candidates use varied representations of mathematical ideas to support and deepen students’ mathematical understanding. [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a> ]	X#1 X#2 <input type="checkbox"/> #3 X#4 <input type="checkbox"/> #5 <input type="checkbox"/> #6 <input type="checkbox"/> #7 X#8
<b>6. Knowledge of Technology.</b> Candidates embrace technology as an essential tool for teaching and learning mathematics. [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a> ]	X#1 <input type="checkbox"/> #2 X#3 X#4 <input type="checkbox"/> #5 X#6 <input type="checkbox"/> #7 <input type="checkbox"/> #8
<b>7. Dispositions.</b> Candidates support a positive disposition toward mathematical processes and mathematical learning. [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a> ]	<input type="checkbox"/> #1 <input type="checkbox"/> #2 X#3 X#4 <input type="checkbox"/> #5 X#6 X#7 <input type="checkbox"/> #8

NCTM STANDARD	APPLICABLE ASSESSMENTS FROM SECTION II			
<p><b>8. Knowledge of Mathematics Pedagogy.</b> Candidates possess a deep understanding of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning                      [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a>]</p>	<b>X#1</b>	<b>X#2</b>	<b>X#3</b>	<b>X#4</b>
<b>Mathematics Preparation for Secondary Level Mathematics Teacher Candidates</b>	<b>X#5</b>	<b>X#6</b>	<b>X#7</b>	<input type="checkbox"/> #8
<p><b>9. Knowledge of Number and Operations.</b> 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.                      [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a>]</p>	<b>X#1</b>	<b>X#2</b>	<input type="checkbox"/> #3	<input type="checkbox"/> #4
<p><b>10. Knowledge of Different Perspectives on Algebra.</b> Candidates emphasize relationships among quantities including functions, ways of representing mathematical relationships, and the analysis of change.                      [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a>]</p>	<input type="checkbox"/> #5	<input type="checkbox"/> #6	<b>X#7</b>	<input type="checkbox"/> #8
<p><b>11. Knowledge of Geometries.</b> Candidates use spatial visualization and geometric modeling to explore and analyze geometric shapes, structures, and their properties.                      [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a>]</p>	<b>X#1</b>	<b>X#2</b>	<input type="checkbox"/> #3	<input type="checkbox"/> #4
<p><b>12. Knowledge of Calculus.</b> Candidates demonstrate a conceptual understanding of limit, continuity, differentiation, and integration and a thorough background in techniques and application of the calculus.                      [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a>]</p>	<input type="checkbox"/> #5	<input type="checkbox"/> #6	<input type="checkbox"/> #7	<input type="checkbox"/> #8
<p><b>13. Knowledge of Discrete Mathematics.</b> Candidates apply the fundamental ideas of discrete mathematics in the formulation and solution of problems.                      [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a>]</p>	<b>X#1</b>	<b>X#2</b>	<input type="checkbox"/> #3	<input type="checkbox"/> #4
<p><b>14. Knowledge of Data Analysis, Statistics, and Probability.</b> Candidates demonstrate an understanding of concepts and practices related to data analysis, statistics, and probability.                      [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a>]</p>	<input type="checkbox"/> #5	<input type="checkbox"/> #6	<input type="checkbox"/> #7	<input type="checkbox"/> #8
<p><b>15. Knowledge of Measurement.</b> Candidates apply and use measurement concepts and tools.                      [Indicators are listed at <a href="http://www.nctm.org/about/ncate/secondary_indic.htm">http://www.nctm.org/about/ncate/secondary_indic.htm</a>]</p>	<b>X#1</b>	<b>X#2</b>	<input type="checkbox"/> #3	<input type="checkbox"/> #4
<p><b>16.1 Field-Based Experiences</b> Engage in a sequence of planned opportunities prior to student teaching that includes observing and participating secondary mathematics classrooms under the supervision of experienced and highly qualified teachers.</p>	<input type="checkbox"/> #5	<input type="checkbox"/> #6	<input type="checkbox"/> #7	<input type="checkbox"/> #8
	<b>Information is provided in Section I (Context) to address this indicator.</b>			

<b>NCTM STANDARD</b>	<b>APPLICABLE ASSESSMENTS FROM SECTION II</b>
<p><b>16.2 Field-Based Experiences</b> Experience full-time student teaching secondary-level mathematics that is supervised by an experienced and highly qualified teacher and a university or college supervisor with elementary mathematics teaching experience.</p>	<p><b>Information is provided in Section I (Context) to address this indicator.</b></p>
<p><b>16.3 Field-Based Experiences</b> Demonstrate the ability to increase students' knowledge of mathematics.</p>	<p><input type="checkbox"/>#1    <input type="checkbox"/>#2    <input checked="" type="checkbox"/>#3    <input checked="" type="checkbox"/>#4  <input checked="" type="checkbox"/>#5    <input checked="" type="checkbox"/>#6    <input checked="" type="checkbox"/>#7    <input type="checkbox"/>#8</p>

## SECTION IV—EVIDENCE FOR MEETING STANDARDS

**DIRECTIONS:** The 6-8 key assessments listed in Section II must be documented and discussed in Section IV. The assessments must be those that all candidates in the program are required to complete and should be used by the program to determine candidate proficiencies as expected in the program standards. In the description of each assessment below, the SPA has identified potential assessments that would be appropriate. Assessments have been organized into the following three areas that are addressed in NCATE’s unit standard 1:

- Content knowledge<sup>4</sup>
- Pedagogical and professional knowledge, skills and dispositions
- Focus on student learning

For each assessment, the evidence for meeting standards should include the following information:

1. A brief description of the assessment and its use in the program (one sentence may be sufficient);
2. A description of how this assessment specifically aligns with the standards it is cited for in Section III.
3. A brief analysis of the data findings;
4. An interpretation of how that data provides evidence for meeting standards; and
5. Attachment of assessment documentation, including<sup>5</sup>:
  - (a) the assessment tool or description of the assignment;
  - (b) the scoring guide for the assessment; and
  - (c) candidate data derived from the assessment.

*The narrative section for **each** assessment (1-4 above) is limited to two text pages. It is preferred that each attachment for a specific assessment (5a-c above) be limited to the equivalent of five text pages, however in some cases assessment instruments or scoring guides may go beyond 5 pages.*

**#1 (Required)-CONTENT KNOWLEDGE: Data from licensure tests or professional examinations of content knowledge.** NCTM standards addressed in this entry could include but are not limited to Standards 1-7 and 9-15. If your state does not require licensure tests or professional examinations in the content area, data from another assessment must be presented to document candidate attainment of content knowledge.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

### Praxis II: Mathematics: Content Knowledge (0061)

<sup>4</sup> In some disciplines, content knowledge may include or be inextricable from professional knowledge. If this is the case, assessments that combine content and professional knowledge may be considered “content knowledge” assessments for the purpose of this report.

<sup>5</sup> All three components of the assessment – as identified in 5a-c – must be attached, with the following exceptions: (a) the assessment tool and scoring guide are not required for reporting state licensure data, and (b) for some assessments, data may not yet be available.

**1. A brief description of the assessment and its use in the program:**

The Praxis Content Knowledge test in Mathematics is designed to assess the mathematical knowledge and competencies necessary for a beginning teacher of secondary school mathematics. Teacher candidates are expected to understand and apply mathematical concepts, reason mathematically, make conjectures, recognize patterns, justify statements using logical arguments, construct simple proofs, and demonstrate the ability to solve a variety of problems by making interdisciplinary connections and representations.

**2. A description of how this assessment specifically aligns with the standards it is cited for in Section III.**

<b>Content Category</b>	<b>NCTM Standards in which specific indicators exist.</b>
<b>Algebra &amp; Number Theory</b>	<b>10</b>
<b>Measurement</b>	<b>15</b>
<b>Geometry</b>	<b>11</b>
<b>Trigonometry</b>	<b>12</b>
<b>Functions</b>	<b>10</b>
<b>Calculus</b>	<b>12</b>
<b>Data Analysis &amp; Statistics</b>	<b>14</b>
<b>Probability</b>	<b>14</b>
<b>Matrix Algebra</b>	<b>10</b>
<b>Discrete Mathematics</b>	<b>13</b>

**NCTM Standards 1, 2, 4, 5, and 6 are distributed across Content Categories.**

**3. A brief analysis of the data findings:**

For the year 2006-07, there were 2 candidates who took the Praxis II tests in mathematics -- both through the Alternative Certification Program (ACP). Both candidates passed Praxis II Mathematics Content Knowledge Test. That represents a 100% pass rate for that test; however, no candidates met the requirement for passing Praxis II Proofs, Models & Problems during that year.

There were no candidates among undergraduate secondary education minors or MAT degree candidates for the year 2006-07 who took Praxis II Mathematics Content Knowledge.

**4. An interpretation of how the data provides evidence of meeting standards:\***

The candidates in the Alternative Certification Program are required demonstrate that they meet mathematics content knowledge standards as a part of their admission requirements. The pass rate of 100% demonstrates that the 2 mathematics candidates for 2006-07 met the standards for mathematics content knowledge

**5. Attachment of assessment documentation:**

- (a) Not applicable for this assessment.
- (b) Not applicable for this assessment.
- (c) See Attachment A.

**ATTACHMENT A**

<b>Mathematics Candidates in ACP for 2006-07</b>	<b>Score on Praxis II Mathematics: Content Knowledge</b>	<b>Score on Praxis II Proofs, Models &amp; Problems*</b>
Candidate A (DD)	156 (pass)	144 (did not pass)
Candidate B (SA)	153 (pass)	Did not take

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\* One candidate attempted, but did not pass, the Praxis II Proofs, Models & Problems test. The other candidate did not attempt Praxis II Proofs, Models & Problems test during that year.

**#2 (Required)-CONTENT KNOWLEDGE: Assessment of content knowledge in mathematics.** NCTM standards addressed in this entry could include but are not limited to Standards 1-7 AND 9-15. Examples of assessments include comprehensive examinations, GPAs or grades,<sup>6</sup> and portfolio tasks.<sup>7</sup>

Provide assessment information (items 1-5) as outlined in the directions for Section IV

**Section IV – Assessment 2**  
**Department of Mathematics Senior Comprehensive Examination and**  
**Transcript Review Form for Mathematics Coursework and Grades**

**1. A brief description of the assessment and its use in the program:**

**For undergraduate secondary professional minors in mathematics.** The Department of *Mathematics Senior Comprehensive Examination* is administered annually in the Fall Semester of the academic year to all mathematics majors, including secondary education professional minors. The examination covers content coursework (See #2) that is common to all majors in the following strands: pure mathematics, applied mathematics, actuarial science, computer science, and secondary education. The examination requires candidates to solve 10-12 problems in a constructed-response format. Successful candidates must earn a minimum score of 60% on the examination.

**For candidates in the M.A.T. Secondary Education Program and the Alternative Certification Program.** A *transcript review* of their undergraduate mathematics coursework and grades is the assessment method used to determine knowledge of content.

**2. A description of how these assessments specifically align with the standards it is cited for in Section III.**

Coursework covered by the Math Senior Comps and the Transcript Analysis	NCTM Standards
Calculus I (MATH 156)*	1.1, 1.2, 4.2, 5.1, 10.1, 10.4, 12.1, 12.2, 12.3, 12.4
Calculus II (MATH157)*	1.1, 1.2, 5.1, 10.1, 10.2, 12.1, 12.2, 12.3
Calculus III (MATH 158)*	1.1, 1.2, 5.1, 10.1, 12.1, 12.2, 12.3
Linear Algebra (MATH 180)	1.1, 1.2, 9.9, 10.2
Introduction to Analysis (MATH 195)* (WRTG)	1.1, 1.2, 1.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 9.6, 9.7, 9.10
Proofs & Problems: Seminar I (MATH 101)*	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4
Proofs & Problems: Seminar II (MATH	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2,

<sup>6</sup> If grades are used as the assessment or included in the assessment, provide information on the criteria for those grades and describe how they align with the specialty standards

<sup>7</sup> For program review purposes, there are two ways to list a portfolio as an assessment. In some programs a portfolio is considered a single assessment and scoring criteria (usually rubrics) have been developed for the contents of the portfolio as a whole. In this instance, the portfolio would be considered a single assessment. However, in many programs a portfolio is a collection of candidate work—and the artifacts included are discrete items. In this case, some of the artifacts included in the portfolio may be considered individual assessments.

102)*	3.3, 3.4
Discrete Structures (MATH 181)*	1.1, 1.2, 1.3, 1.4, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 6.1, 13.1, 13.2, 13.3, 13.4
Geometry (MATH 150)#	1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 4.1, 4.2, 4.3, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8
Probability & Statistics I (MATH 189)#	1.1, 1.2, 1.3, 1.4, 4.1, 4.2, 4.3, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 14.8

\* Comprehensive Exam courses; #\* Transcript review courses

### 3. A brief analysis of the data findings:

One (1) undergraduate secondary education professional minor candidate took the Department of Mathematics Senior Comprehensive Examination in the Spring Semester of AY2006-07. The candidate received a score of 28%. The minimum passing score is 60%.

There were no candidates in the M.A.T. Secondary Education Program in mathematics 2006-07.

All candidates in the Alternative Certification Program (ACP) in mathematics have a grade point average of at least 2.7 (on a 4.0 scale) in their undergraduate mathematics content courses. It is a minimum requirement for admission to the graduate ACP.

### 4. An interpretation of how the data provides evidence of meeting the standards:

#### For undergraduate secondary professional minors in mathematics.

These results indicate that the 1 undergraduate secondary professional minor candidate did not meet the minimum score required to pass the senior comprehensive examination in the Department of Mathematics.

#### For candidates in the M.A.T. Secondary Education Program and the Alternative Certification Program.

There is alignment of the mathematics courses required for majors and the NCTM standards; therefore, ACP candidates who earn at least of grade of “C” or better in the courses listed above meet the content knowledge standards.

No M.A.T. Secondary Education Program were enrolled for the year 2006-07.

### 5. Attachment of assessment documentation:

- (a) Copy of Department of Mathematics Senior Comprehensive Examination (Spring Semester 2007) and copy of Transcript Review Form
- (b) Not applicable
- (c) Results of transcript analysis of candidates in ACP

**#3 (Required)-PEDAGOGICAL AND PROFESSIONAL KNOWLEDGE, SKILLS, AND DISPOSITIONS: Assessment that demonstrates candidates can effectively plan classroom-based instruction.** NCTM standards that could be addressed in this assessment include but are not limited to Standard 8. Examples of assessments include the evaluation of candidates' abilities to develop lesson or unit plans, individualized educational plans, needs assessments, or intervention plans.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

### Section IV – Assessment 3 Unit Plan in the Content Areas

#### 1. A brief description of the assessment and its use in the program:

The Unit Plan in the Content Area assessment is embedded in the methods course, *Teaching Mathematics in Junior and Senior High Schools*, SEED 198 for undergraduate candidates and EDUC 198 for graduate candidates. The Unit Plan assesses candidates' ability to conduct short-term and long-term instructional activities based on the curricular goals of the school district, knowledge of their students and their special learning needs, and learning theories and philosophies of education. A scoring rubric is used to assess and evaluate how well candidates meet the NCTM standards associated with the unit plan. Learning, technology, implementation, and assessment are the foci of the unit plan evaluation.

#### 2. A description of how this assessment specifically aligns with the standard it is cited for in Section III.

The Unit Plan in Mathematics is an assessment of the candidates' expertise in planning long-range (2 week) instruction. In that regard the following NCTM Standards are met: 7.1, 7.4, 7.5, 7.6, 8.1, 8.2, 8.3, 8.4, 8.7 and 8.9.

#### 3. A brief analysis of the data findings;

There was 1 undergraduate candidate in the course, *Teaching Mathematics in Junior and Senior High Schools (SEED 198)*, during the 2006-07 academic year; however, there were no graduate candidates enrolled in the course *EDUC 198*. The undergraduate candidate obtained an overall score of 4.2 (on a scale of 5.0) or 84 (on a scale of 100) on the Unit Plan. This level of performance demonstrates that the candidate met the standards that are aligned with the Unit Plan in the Content Area assessment.

#### 4. An interpretation of how the data provides evidence of meeting the standards.

There are several types of evidence can be used to show how the data provide evidence of meeting the standards. First, the assessment on which the data are drawn is aligned with the specific NCTM standards (See #2). Second, the candidate's performance overall score on the Unit Plan (3.65 on a 5 point scale or 82 on a 100 point scale) provides a holistic assessment and evaluation of the candidates' ability to design long-range instructional plans. Finally, scores on the sub-criteria:

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learning, technology, implementation and assessment provide evidence of exemplary work in planning units of content.

**5. Attachment of assessment documentation:**

- (a) Unit Plan description (Description is embedded in syllabus for the course, *Teaching Mathematics in Junior and Senior High Schools*.)
- (b) Unit Plan rubric
- (c) Unit Plan data (See #3 above and below).

Department of Curriculum & Instruction  
Howard University

Rubric for Scoring Unit Plan\*

Area/ NCTM standard	Excellent --5	Good--3	Poor--1
<p><b>L</b> <b>e</b> <b>a</b> <b>r</b> <b>n</b> <b>i</b> <b>n</b> <b>g</b></p> <p><b>NCTM</b> <b>7.1, 7.4,</b> <b>8.4</b></p> <p><b>Score =</b> <b>4.5</b></p>	<p><input checked="" type="checkbox"/> Unit plan requires students to interpret, evaluate, theorize and/or synthesize information.</p> <p><input checked="" type="checkbox"/> Targeted learning objectives are clearly defined, well articulated and supported.</p> <p><input checked="" type="checkbox"/> All learning objectives clearly align with state framework, content standards, and benchmarks of the subject area(s).</p> <p><input type="checkbox"/> Unit plan has well-defined accommodations to support a diversity of learners.</p>	<p><input type="checkbox"/> Unit plan requires students to analyze and apply information, solve problems, and/or make conclusions</p> <p><input type="checkbox"/> Targeted learning objectives are defined and moderately supported</p> <p><input type="checkbox"/> Some learning objectives align with state frameworks, content standards, and benchmarks or the subject area(s).</p> <p><input checked="" type="checkbox"/> Unit Plan offer minimal accommodations to support a diversity of learners.</p>	<p><input type="checkbox"/> Unit Plan requires students to define, identify, describe, and/or summarize. Very little higher-level thinking is required.</p> <p><input type="checkbox"/> Targeted learning objectives are vague and not clearly supported. Relationship between learning objectives and state frameworks, content standards, and benchmarks unclear.</p> <p><input type="checkbox"/> Unit Plan does not accommodate a diversity of learners.</p>
<p><b>T</b> <b>e</b> <b>c</b> <b>h</b> <b>n</b> <b>o</b> <b>l</b> <b>o</b> <b>g</b> <b>y</b></p> <p><b>NCTM</b> <b>7.6, 8.9</b></p> <p><b>Score =</b> <b>2.5</b></p>	<p><input type="checkbox"/> Proposed technology use is engaging, age appropriate, beneficial to student learning and supportive of higher-level thinking skills.</p> <p><input type="checkbox"/> Technology is integral to the success of the Unit Plan</p> <p><input type="checkbox"/> A clear relationship between the use of technology and student learning is exhibited by the student samples.</p> <p><input type="checkbox"/> Use of technology enhances the Unit Plan by using the computer as a research tool, publishing tool, and a communication device.</p>	<p><input checked="" type="checkbox"/> Proposed technology use is engaging and age appropriate, but it is unclear as to how it enhances student learning.</p> <p><input checked="" type="checkbox"/> Technology is important, but not integral, to the Unit Plan</p> <p><input type="checkbox"/> A limited relationship between the use of technology and student learning is exhibited by the student samples.</p> <p><input type="checkbox"/> Use of technology is limited to using the computer as a research tool, a publishing tool, or a communication device.</p>	<p><input type="checkbox"/> Proposed technology is not age appropriate, nor engaging, and does not enhance student learning.</p> <p><input type="checkbox"/> Importance of technology to the Unit Plan is unclear.</p> <p><input checked="" type="checkbox"/> No relationship between the use of technology and student learning is exhibited by the student samples.</p> <p><input type="checkbox"/> Unit Plan does not take advantage of research publishing, and communication capabilities.</p>

Rubric for Scoring Unit Plan, cont.

	5	3	1
	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
<p><b>I</b> <b>m</b> <b>p</b> <b>l</b> <b>e</b> <b>m</b> <b>e</b> <b>n</b> <b>t</b> <b>a</b> <b>t</b> <b>i</b> <b>o</b> <b>n</b></p> <p><b>NCTM</b> <b>8.1,</b> <b>8.2,</b> <b>8.3,</b> <b>8.7</b> <b>Score=</b> <b>4.0</b></p>	<p><input checked="" type="checkbox"/> Unit Plan provides a well-developed model and guideline for implementation.</p> <p>Unit Plan can be easily modified and implemented in a variety of classrooms.</p>	<p><input type="checkbox"/> .A model for project replication is provided, but the model needs more complete guidelines.</p> <p><input checked="" type="checkbox"/> Unit Plan might be applicable to other classrooms.</p>	<p><input type="checkbox"/> Model and guidelines for Unit Plan replication lack clarity.</p> <p><input type="checkbox"/> Unit Plan is limited to the teacher’s own classroom.</p>
<p><b>A</b> <b>s</b> <b>s</b> <b>e</b> <b>s</b> <b>s</b> <b>m</b> <b>e</b> <b>n</b> <b>t</b></p> <p><b>NCTM</b> <b>7.5</b> <b>Score =</b> <b>3.6</b></p>	<p><input type="checkbox"/> Instrument(s) for authentic assessment and evaluation are included.</p> <p><input checked="" type="checkbox"/> A clear relationship is evident between learning objectives and assessment of student learning.</p> <p><input type="checkbox"/> Assessment tools contain topic-specific criteria in order to serve as a helpful scaffold for students.</p>	<p><input checked="" type="checkbox"/> Instrument(s) for assessment of most targeted objectives are included.</p> <p><input type="checkbox"/> Some relationship is evident between learning objectives and assessment.</p> <p><input checked="" type="checkbox"/> Assessment tools contain some topic-specific criteria, but may be unclear to students.</p>	<p><input type="checkbox"/> Instruments for assessment of targeted objectives are not included or the assessment does not match the targeted objectives.</p> <p><input type="checkbox"/> Relationship between objectives and assessment tool is unclear.</p> <p><input type="checkbox"/> Assessment tools contain only general criteria.</p>

**Instructor's Comments:**

Dear Candidate:

The topic that you chose is very challenging, but you did an admirable job of designing a 10-day unit plan for 9<sup>th</sup> and 10<sup>th</sup> graders.

*Strengths:* Inclusion of an Introduction helps the reader to understand what the goals are for the unit. The use of the medical care case study helps students to apply and connect what they are learning to a real world situation. The mathematical exercises that you have included challenge the learner to think critically through the use of "logic and reasoning." The homework, quizzes, warm-ups and project provide a variety of ways to assess what student are learning.

*Weaknesses:* The lessons follow the same routine everyday. You may not be able to keep the attention of a group of students at this age. There is no differentiation of instruction for SPED students for different lessons. You repeat the same routine everyday. The rubric that is used is specifically for an assessment that has a particular number of items. Yet, your homework assignments have different number of items each day. Also, there is no unit test at the end of the unit. There is no key for your quizzes.

*Suggestions:* Examine ways to differentiate instruction for the SPED students. You may consider group work in which there are students of different achievement levels. Develop a summative unit assessment. It does not have to be in paper and pencil format. Revisit your rubric and make it fit the type of assessments for which it is used -- it needs to be more flexible.

Candidate: \_\_\_ 101 \_\_\_\_\_  
Semester: \_\_\_ Fall 2006 \_\_\_\_\_  
Status:  Undergraduate \_\_\_ Graduate  
Instructor: \_\_\_ Hughes \_\_\_\_\_  
Score: \_\_\_ 82% \_\_\_\_\_

*Note:* Scores on a 5-point scale are calculated by taking an average of the scores across areas: learning, implementation, technology, and assessment. Scores are continuous and can take on intermediate values. To convert to a 100-point scale, multiply by 20.

\*This Unit Plan rubric is adapted from a similar rubric in *The Intel Teach to the Future (Faculty Edition, 2001)*.

**#4 (Required)-PEDAGOGICAL AND PROFESSIONAL KNOWLEDGE, SKILLS, AND DISPOSITIONS:** Assessment that demonstrates candidates' knowledge, skills, and dispositions are applied effectively in practice. NCTM standards that could be addressed in this assessment include but are not limited to Standard 8. The assessment instrument used in student teaching or an internship should be submitted.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

**Section IV – Assessment 4  
Teacher Candidate Assessment Instrument  
Weekly Progress Observation Form (Parts I, II & III)**

**1. A brief description of the assessment and its use in the program:**

All candidates in the Secondary Education Programs are required to complete a clinical practice internship in the District of Columbia public schools or surrounding school districts. The length of the internship depends on the program in which a candidate is enrolled. Undergraduate and M.A.T. candidates participate in a 12-week internship. During their internship, candidates are evaluated twice by their cooperating teacher and university supervisor, for a total of four evaluations throughout the 12 week internship. The first two evaluations are conducted at mid-point of the semester and the last two evaluations are conducted at the conclusion or end-point of the internship. The evaluation instrument used is the Teacher Candidate Assessment Instrument. ACP candidates participate in a year-long supervised on-the-job clinical experience.

The construction of the *Teacher Candidate Assessment Instrument* was guided by the Interstate New Teacher Assessment and Support Consortium (INTASC) Standards and is aligned with the teaching standards of the content professional organization such as the NCTM, NCTE, and NCTSS. The instrument assesses each candidate's competency in 10 areas that include knowledge of subject matter, human development and learning, student diversity, instructional strategies, classroom organization and behavior management, communication, instructional planning skills, assessment, professional commitment and responsibility, and family, school and community partnerships. This instrument is used universally by all programs in the Department of Curriculum and Instruction to assess candidates' performance during their internship.

The instrument that was used to assess ACP candidates' ability to teach was the *Weekly Progress Observation Form*: Parts I – III. The form was completed by a mentor who was assigned to each ACP candidate.

**2. A description of how this assessment specifically aligns with the standards it is cited for in Section III:**

The alignment between the Teacher Candidate Assessment Instrument and the NCTM Standards is presented below.

Teacher Candidate Assessment Instrument and the Weekly Progress Observation Form	NCTM Standards
1. Knowledge of Subject Matter	8.1, 8.6
2. Human Development and Learning	7.1, 8.1
3. Student Diversity	7.1, 8.1
4. Instructional Strategies	6.1, 7.2, 7.6, 8.3, 8.4, 8.7, 8.9
5a. Classroom Organization	8.1, 8.7
5b. Behavior Management	7.3
6. Communication	3.1, 3.2, 3.3, 3.4, 8.8
7. Instructional Planning Skills	8.1, 8.2, 8.3, 8.4
8. Assessment	7.5
9. Professional Commitment and Responsibility	8.5, 8.6
10. Partnerships	8.5

**3. A brief analysis of the data findings:**

For the year 2006-07, there were no undergraduate candidates or M.A.T. candidates in mathematics enrolled in student teaching or Internship in which the Teacher Candidate Assessment Instrument is used. Two (2) candidates in the ACP earned an average score of 3 or more on a 5-point scale on each of Parts I, II and III of the WPO form to meet the standard. Average scores of 1 or 2 on any section of the WPO form means that standards was unmet.

**4. An interpretation of how that data provides evidence for meeting standards:**

The data show that 100% of candidates in the Alternative Certification Program in secondary mathematics education received acceptable ratings on all sections of the *Weekly Progress Observation Form*. Hence, all candidates demonstrated their ability to teach students.

**5. Attachment of assessment documentation:**

- (a) **Teacher Candidate Assessment Instrument; Weekly Progress Observation Form**
- (b) **Scoring guide for the Teacher Candidate Assessment Instrument & WPO Form**
- (c) **Candidate data derived from the assessment**

**5(c)**

Secondary Education Mathematics Program	TCAI Form			Weekly Progress Observation Form	
	T	A	U	Met	Not met
Undergraduate Minor	--	--	--		
M.A.T. Program	--	--	--		
Alternative Certification	n/a	n/a	n/a	2	0

**T=Target; A= Acceptable; U=Unacceptable**

**#5 (Required)-EFFECTS ON STUDENT LEARNING: Assessment that demonstrates candidate effects on student learning.** NCTM standards that could be addressed in this assessment include but are not limited to Standard 8. Examples of assessments include those based on student work samples, portfolio tasks, case studies, follow-up studies, and employer surveys.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

**Section IV – Assessment 5  
Action Research Project  
Weekly Progress Observation Form ( Item 5 or Part IV )**

**1. A brief description of the assessment and its use in the program:**

All candidates in the Secondary Education degree programs must conduct an Action Research project during the last year of their program. Through the action research project, candidates (1) demonstrate an understanding of some of the important educational problems that stakeholders in urban schools face, especially in the area of mathematics teaching and learning; (2) provides an opportunity for the candidates to collect evidence of the impact of their training on student learning; and (3) demonstrate practical knowledge and skills of educational assessment and evaluation. Furthermore, by conducting an action research, candidates exercise their abilities to think critically, to analyze and solve problems, to make ethical decisions, to apply knowledge by linking theory to practice, and to show their sensitivity to diverse populations in public schools.

For graduate candidates, the development of an action research project consists of two critical stages. First, in the semester prior to the clinical internship, candidates construct their action research proposals in EDUC 379 *Research in Curriculum and Teaching* course. Second, the research proposal is carried out in conjunction with candidates' clinical internship in the following semester. For undergraduate candidates, presentations on how to conduct the project are made during the student teaching seminar. Benchmarks with due dates for various components of the project and paper are established throughout the semester. Upon completion of the project, action research findings are presented before candidates' fellow student teachers, faculty members, and cooperating teachers at the end of the clinical internship. Research reports are scored by faculty members in the program with a rubric system.

The instrument that was used to assess ACP candidates' ability to teach was the *Weekly Progress Observation Form: Item 5* and the Comments. The form was completed by a mentor who was assigned to each ACP candidate.

**2. A description of how this assessment specifically aligns with the standards it is cited for in Section III.**

The components of the Action Research Project are aligned with NCTM standards 8.1, 8.6, 16.2, 16.3 and INTASC Standard 8: Assessment. The action research process consists of candidates

conducting a needs assessment, identifying a classroom based problem or a question, collecting and analyzing baseline data, identifying an intervention, implementing a classroom intervention; formative data collection, analyses and summative data; interpretations, and implications for future teaching. Projects are evaluated on these dimensions using a 3-point rubric system that consists of indicators including “Exceeded,” “Met,” and “Needs Work – Resubmit.”

**Alignment between the Action Research Project and NCTM Standards**

<b>Components of Action Research Project</b>	<b>Aligned with NCTM Standards</b>
Conducting a needs assessment	8.3
Identifying a classroom-based problem or a question	8.6
Collecting and analyzing baseline data	7.5
Identifying an intervention	8.1
Implementing a classroom intervention	8.2, 8.4, 8.7
Formative data collection	7.5, 8.3
Analyses and summative data	7.5, 8.3
Interpretation of findings	8.7
Implications for future teaching	7.3

**3. A brief analysis of the data findings:**

There were no program completers for the mathematics undergraduate professional minor program nor in the M.A.T. mathematics Secondary Education Program therefore, no candidates were in the Student Teaching or Internship course in which the Action Research Project is completed.

For the Alternative Certification Program, the evaluation of the 2 candidates’ affect on student learning is inferred from mentor’s comments on the *Weekly Progress Observation Form -- Part IV*. Both candidates received satisfactory comments about the student learning that was going on in the classroom during the observations.

**4. An interpretation of how that data provides evidence for meeting standards:**

Both candidates in the ACP met the standard of having a positive effect on student learning in mathematics.

**5. Attachment of assessment documentation:**

- (a) Action Research Project; Weekly Progress Observation Form (Part IV)**
- (b) Scoring guide for the Action Research Project & WPO (Part IV)**
- (c) Candidate data derived from the assessment**

**#6 (Required): Additional assessment that addresses NCTM standards.** Examples of assessments include evaluations of field experiences, case studies, portfolio tasks, licensure tests not reported in #1, and follow-up studies.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

**Section IV – Assessment 6  
Praxis II: Mathematics Pedagogy (0065)**

**1. A brief description of the assessment and its use in the program:**

The Praxis II Mathematics Pedagogy test is designed to assess the mathematical knowledge and competencies necessary for a beginning teacher of secondary school mathematics. The test focuses on the NCTM process standards, problem solving, communication, reasoning, and mathematical connections associated with pedagogy. The test is presented in a constructed response format. More specifically, candidates must answer 3 essays questions related to preparation for teaching; implementation of teaching; and evaluation of student understanding.

Candidates in the mathematics secondary education programs must take and pass this test before program completion.

**2. A description of how this assessment specifically aligns with the standards it is cited for in Section III.**

According to the Praxis II Mathematics Pedagogy test materials, the candidate can be ask to demonstrate the following competencies that are aligned with NCTM standards.

<b>Competencies assessed on Praxis II: Mathematics Pedagogy</b>	<b>NCTM Standards</b>
Identify and analyze student errors and suggest ways to help the student.	7.3, 8.3
Identify prerequisite skills and understanding for studying a certain topic & explain how you evaluate student responses.	7.4, 8.3
Identify several problem-solving strategies that might be useful to students.	8.7, 8.8
Use appropriate forms of representation and a variety of teaching strategies.	8.2
Demonstrate an understanding of connections among mathematical topics and real-world situations.	7.4
Discuss appropriate use of technology in all aspects of a lesson.	7.6, 8.9
Know how to teach different gender, racial, ethnic, and SES groups.	7.1, 8.1
Evaluate student learning of mathematics.	7.5, 8.3

**3. A brief analysis of the data findings:**

For the year 2006-07, there were 2 program candidates in mathematics -- both through the Alternative Certification Program (ACP). Analysis of the data indicates that 2 or 100% of the Alternative Certification Program (ACP) completers for 2006-07 successfully passed the Praxis II Mathematics Pedagogy test.

There were no program candidates in the undergraduate secondary education minor program or the MAT degree program for the year 2006-07.

**4. An interpretation of how that data provides evidence from meeting standards:**

The topics covered by the Praxis II: Mathematics Pedagogy are aligned with several NCTM standards. Thus, the 2 candidates in the Alternative Certification Program whose scores exceed the minimum score required for certification also show evidence of meeting the NCTM standards for this assessment. The pass rate of 100% demonstrates that candidates for 2006-07 met those standards.

**5. Attachment of assessment documentation:**

- (d) Not applicable for this assessment.
- (e) Not applicable for this assessment.
- (f) See Attachment A

**ATTACHMENT A**

<b>Mathematics Candidates in ACP for 2006-07</b>	<b>Score on Praxis II Mathematics: Pedagogy</b>	<b>Minimum score required to pass</b>
Candidate A	150	141
Candidate B	160	141

**#7 (Optional): Additional assessment that addresses NCTM standards.** Examples of assessments include evaluations of field experiences, case studies, portfolio tasks, licensure tests not reported in #1, and follow-up studies.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

**#8 (Optional): Additional assessment that addresses NCTM standards.** Examples of assessments include evaluations of field experiences, case studies, portfolio tasks, licensure tests not reported in #1, and follow-up studies.

Provide assessment information (items 1-5) as outlined in the directions for Section IV

## SECTION V—USE OF ASSESSMENT RESULTS TO IMPROVE CANDIDATE AND PROGRAM PERFORMANCE

Evidence must be presented in this section that assessment results have been analyzed and have been or will be used to improve candidate performance and strengthen the program. This description should not link improvements to individual assessments but, rather, it should summarize principal findings from the evidence, the faculty's interpretation of those findings, and changes made in (or planned for) the program as a result. Describe the steps program faculty has taken to use information from assessments for improvement of both candidate performance and the program. **This information should be organized around (1) content knowledge, (2) professional and pedagogical knowledge, skill, and dispositions, and (3) student learning.**

(response limited to 3 pages)

### 1. Content Knowledge

The data for the 2006-07 academic year indicate that candidates meet competence and standards for mathematics content knowledge by their performance on Praxis II Mathematics Content Knowledge test and Praxis II Pedagogy test; however, the data show that candidates have not passed or have not attempted to take the Praxis II Proofs, Models, and Problems I test. One candidate attempted Praxis II Proofs test once and failed by 1 point. A de-briefing session with the candidate revealed that his failure was due mainly to poor time management during the test. That candidate is scheduled to re-take the Proofs test in March 2008. The other graduate candidate has not attempted the Proofs test. That candidate accepted a teaching position in the state of Maryland. Maryland does not require Praxis II Proofs to be certifiable.

All of the data on the Praxis II tests reported for the target year 2006-07 are for post baccalaureate candidates in the Alternative Certification Program. This does not mean that there are no undergraduate candidates in the secondary education program in mathematics. Rather, the lack of data for undergraduate candidates on the Praxis Series indicates that many are postponing taking the tests for several reasons, including lack of confidence and the need to take more qualifying courses. Passing scores on all three Praxis II mathematics tests are part of the requirements for qualifying for certification and licensure to teach mathematics in secondary schools in the District of Columbia.

In addition to the external assessments, the datum from the internal assessment, the Department of Mathematics Senior Comprehensive Examination, indicates that the one undergraduate candidate who attempted the test failed to pass it in Spring Semester 2007. Apparently, failure of this examination has not prevented this candidate from obtaining employment as a high school mathematics teacher in the Washington Metropolitan area. To be fair, this candidate received excellent classroom observation reports when enrolled in student teaching. This candidate also completed an action research project the results of which were the subject of a peer-reviewed presentation at the annual meeting of National Council of Teachers of Mathematics in Spring Semester 2005 when the candidate was in student teaching. Still, the lack of a passing score on the

Department of Mathematics comprehensive examination means that the candidate has not completed the secondary education program nor has the candidate received a baccalaureate degree.

What the above discussion reveals, in part, is that candidates complete the secondary education program in non-traditional trajectories. In fact, rather than completing the program in cohorts that progress through the program in-sync, we are discovering that candidates move in and out of the secondary education program based on personal circumstances related to finances, family, and “time-in-the-program” issues. This discovery explains why some of the frequencies related to candidate data may not seem to match from one assessment to an apparent subsequent or consecutive assessment.

All of the candidates, with undergraduate and graduate status, took and passed all parts of Praxis I. To assist candidates with preparation for the pre-professional tests, the Department of Curriculum & Instruction teamed with the Center for Academic Reinforcement (a co-academic program in the School of Education). At the Center, candidates are administered a diagnostic instrument to ascertain areas of strength and weakness; then, they are recommended for tutoring. One suggestion for improvement in the area of content knowledge is to focus on candidates’ *confidence* to take and pass the Praxis II Proofs, Models & Problems I. We have already engaged one faculty in the College of Arts & Sciences (COAS) in a preparation program for the candidates to accomplish this goal. Dr. Adeniran Adeboye, former Director of Undergraduate Education, offers tutoring to candidates who desire additional preparation for either of the Praxis II content tests. Our aim is to increase the participation of the COAS faculty in a more substantive way.

## **2. Professional and Pedagogical Knowledge, Skills and Dispositions**

With respect to teaching performance, the data indicate that the use and integration of technology as a strategy to enhance the teaching and learning of social studies can be improved. For this report, however, other assessments were used to provide evidence of candidates’ professional and pedagogical knowledge and skills. Nevertheless, the portfolio may provide another way of collecting evidence that standards are met. All candidates are required to develop a portfolio. At present, the social studies undergraduate and graduate programs are redesigning the portfolio requirements as well as transitioning between the development of the traditional portfolio and the electronic portfolio. The electronic portfolio provides more opportunities to use technology to document and communicate progress and growth over time and provides candidates more practice with using technology. The electronic portfolio is planned as a future assessment.

The faculty in the Department of Curriculum and Instruction are also engaged with the Office of Assessment in the School of Education in refining an instrument to measure candidates’ dispositions directly. These data will be in addition to the indirect measures of dispositions such as “statements of interest” in teaching that are a part of the admissions criteria.

## **3. Effects on Student Learning**

The data indicate that candidates are meeting the standards in regards to the assessment of candidate impact on student learning. While the assessment results did not show a significant discrepancy in this and other areas of professional content knowledge on internal assessments and

practice, through the program self-study and breakdown of the data, we did recognize that more explicit efforts must be made to help candidates measure their effect on student achievement. More specifically, candidates need more opportunities to use assessment strategies to determine impact on student learning and then make needed changes in their teaching practice. One program change to help achieve this goal is already in place. Candidates now are required to conduct an action research project. The action research project involves assessing and reflecting upon one's practice to determine areas for improvement, the development of a wide range of assessments such as baseline data collection and analyses, educational intervention, formative data collection and analyses, and implications for future practice. The development of a new and improved rubric to capture the nuances of this data was also developed.

#### 4. Future Goals

There are several ways to engage our COAS faculty. One effort such effort is described in #1 under "Content Knowledge." Additionally, each year the Office of the Provost sponsors a small grant program titled, *Fund for Excellence*. These small grants make funds of up to \$5,000 available to carry out activities that will improve programs of study at the University. We will make it our aim to apply jointly with other COAS faculty for funds to purchase practice tests, computer software, and refreshments for test preparation sessions. The foci of these sessions will be on (1) developing content knowledge in mathematics and (2) the fundamentals of taking standardized tests which includes time management.

Similarly, the Howard University Transition to Teaching Program (a.k.a. the "Alternative Certification Program (ACP)), cited two main challenges to obtaining certification: (1) passing Praxis exams and (2) clarifying requirements for getting certification in a tri-state region in which requirements differ among states. The Transition to Teaching Program has received an extension on a federal grant of approximately \$56,000 to increase the number of teachers who receive their certification by *providing assistance to pass the Praxis II tests*.

### SECTION VI—For Revised Reports Only

Describe what changes or additions have been made in the report to address the standards that were not met in the original submission. List the sections of the report you are resubmitting and the changes that have been made. Specific instructions for preparing a revised report are available on the NCATE web site at <http://www.ncate.org/institutions/process.asp?ch=4>

ATTACHMENT A  
**Candidate Information**

**Directions:** Provide three years of data on candidates enrolled in the program and completing the program, beginning with the most recent academic year for which numbers have been tabulated. Report the data separately for the levels/tracks (e.g., baccalaureate, post-baccalaureate, alternate routes, master's, doctorate) being addressed in this report. Data must also be reported separately for programs offered at multiple sites. Update academic years (column 1) as appropriate for your data span. Create additional tables as necessary.

<b>Program: Undergraduate Secondary Professional Minor in Mathematics</b>		
<b>Academic Year</b>	<b># of Candidates Enrolled in the Program</b>	<b># of Program Completers<sup>8</sup></b>
2006-07	2	0
2005-06	1	0
2004-05	3	1

<b>Program: Graduate Secondary Education Program Master of Arts in Teaching &amp; Master of Education</b>		
<b>Academic Year</b>	<b># of Candidates Enrolled in the Program</b>	<b># of Program Completers</b>
2006-07		0
2005-06		0
2004-05		0

<b>Program: Graduate Secondary Education Program Alternative Certification in Mathematics</b>		
<b>Academic Year</b>	<b># of Candidates Enrolled in the Program</b>	<b># of Program Completers</b>
2006-07	3	0
2005-06	5	4
2004-05	0	3

<sup>8</sup> NCATE uses the Title II definition for *program completers*. Program completers are persons who have met all the requirements of a state-approved teacher preparation program. Program completers include all those who are documented as having met such requirements. Documentation may take the form of a degree, institutional certificate, program credential, transcript, or other written proof of having met the program's requirements.

**ATTACHMENT B  
Faculty Information**

**Directions:** Complete the following information for each faculty member responsible for professional coursework, clinical supervision, or administration in this program.

<b>Faculty Member Name</b>	<b>Highest Degree, Field, &amp; University<sup>9</sup></b>	<b>Assignment: Indicate the role of the faculty member<sup>10</sup></b>	<b>Faculty Rank<sup>11</sup></b>	<b>Tenure Track (Yes/No)</b>	<b>Scholarship,<sup>12</sup> Leadership in Professional Associations, and Service:<sup>13</sup> List up to 3 major contributions in the past 3 years<sup>14</sup></b>	<b>Teaching or other professional experience in P-12 schools<sup>15</sup></b>
Gerunda B. Hughes	Ph.D.	Faculty	Associate Professor	Yes	(1) Member of the Working Group of the American Statistical Association which published the report, "Using Statistics Effectively in Mathematics Education Research" (2007). (2) Assistant Editor of <i>Review of Educational Research</i> , an AERA journal (2005-08)	In-service Training in assessment: Middle school mathematics teachers
					(3) College Rep to the Executive	

<sup>9</sup> e.g., PhD in Curriculum & Instruction, University of Nebraska

<sup>10</sup> e.g., faculty, clinical supervisor, department chair, administrator

<sup>11</sup> e.g., professor, associate professor, assistant professor, adjunct professor, instructor, administrator

<sup>12</sup> *Scholarship* is defined by NCATE as systematic inquiry into the areas related to teaching, learning, and the education of teachers and other school personnel. Scholarship includes traditional research and publication as well as the rigorous and systematic study of pedagogy, and the application of current research findings in new settings. Scholarship further presupposes submission of one's work for professional review and evaluation.

<sup>13</sup> *Service* includes faculty contributions to college or university activities, schools, communities, and professional associations in ways that are consistent with the institution and unit's mission.

<sup>14</sup> e.g., officer of a state or national association, article published in a specific journal, and an evaluation of a local school program

<sup>15</sup> Briefly describe the nature of recent experience in P-12 schools (e.g. clinical supervision, inservice training, teaching in a PDS) indicating the discipline and grade level of the assignment(s). List current P-12 licensure or certification(s) held, if any.

September 2005

					Committee, DC Council of Teachers of Mathematics.	
Vinetta C. Jones	Ph.D.	Faculty	Professor	Yes		
Wilfred A. Johnson	Ph.D.	Faculty	Associate Professor	Yes		
Jacob Collins	Ed.D.	Faculty	Associate Professor	No		
Blanche S. Brownley	Ed.D.	Faculty	Adjunct Professor	No		
Almeta Stokes	Ph.D.	Faculty	Adjunct Professor	No		
Constance Ellison	Ph.D.	Faculty	Associate Professor	Yes		
Rosalie S. Boone	Ed.D.	Faculty	Professor	Yes		