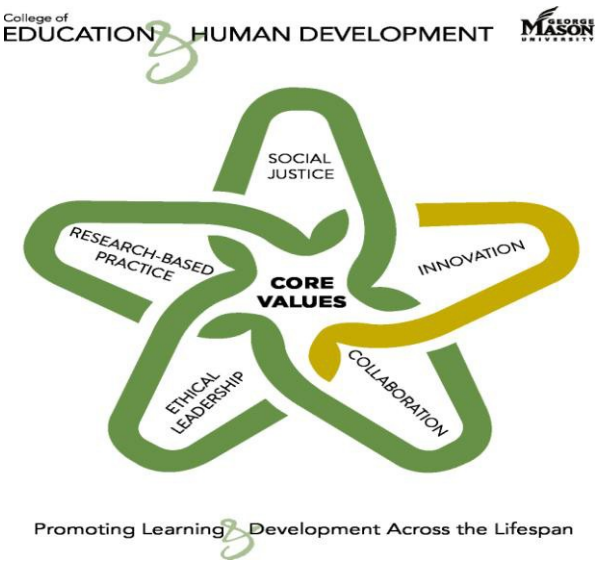

GEORGE MASON UNIVERSITY COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT SECONDARY EDUCATION PROGRAM
SECONDARY EDUCATION

EDCI 472-001
Advanced Methods of
Teaching Mathematics in the Secondary School
3 Credits, Spring 2016
Wednesday 4:30-7:10pm, Robinson A243

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Instructor: Toya Jones Frank, Ph.D.
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Office Hours: by appointment
Teaching Assistant: Kathleen Matson
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Students do not just need mathematics; mathematics needs different people's participation.

(Gutierrez, 2007)

COURSE DESCRIPTION

A. Pre-requisites

EDCI 372/572

B. University Course Catalog Description

This course emphasizes developing different styles of teaching and covers curricula, current

issues, and research literature in secondary school mathematics. School-based field experience required.

C. Expanded Course Description

In *Teaching Mathematics in the Secondary School* course you thought about what it means to *understand* mathematics, were introduced to learning theories, became familiar with standards documents, and learned about characteristics of mathematics instruction that fosters deep understanding of and proficiency in working with mathematics.

In this course, *Advanced Methods of Teaching Mathematics in the Secondary School*, you will learn more about four aspects of mathematics teaching: managing classroom discourse, differentiation, use of technology, equity and assessment. You will explore these aspects of mathematics teaching while keeping a focus on student thinking and learning. Regardless of whether a teacher is engaging with the class, differentiating instruction, or conducting an assessment, the teacher must focus on the development of student thinking about mathematics and a respect for student difference and diversity. You will learn how to do this in this class. This will help you as you embark upon Internship and your first teaching position!

We will address the objectives as we progress through the course, which is organized into four sections:

I. Managing Classroom Discourse

In this part of the course you will critique and learn more about teacher decisions in managing
whole-class mathematical discussions. You will learn more about questioning and will consider appropriate times to ask particular questions. Then, later in the course, you will have the opportunity to practice managing a conversation when you teach a full lesson to the class.

II. Assessment

In this final section of the course you will consider the role of assessment in a mathematics classroom and will learn more about ways that teachers might gain insight into student thinking about mathematics.

III. Differentiation

In this final section of the course, you will become familiar with strategies for differentiating mathematics instruction. By focusing on student thinking, you will learn how to meet student needs while holding them to high standards.

IV. The Responsibility of the Teacher in Today's Schools

In this final section of the course you will consider the role of a *mathematics* teacher in today's world. You will consider your responsibility to the diverse group of students you will be teaching
and to the surrounding community.

LEARNER OUTCOMES or OBJECTIVES

Success in this course is measured by the degree to which you are able to:

- Demonstrate an ability to critique classroom discourse and the role of the teacher in facilitating that discourse through findings from research on student learning
- Demonstrate an ability to plan a mathematics lesson that fosters deep understanding of

mathematics content for *all* students

- Plan a mathematics lesson that includes elements of differentiation, assessment, and technology, is problem-based, requires students to engage in sense making, and engages students in mathematical communication while adhering to state and national standards
- Develop assessments that give a teacher insight into student thinking about mathematics content
- Conduct an analysis of ideas for teaching mathematics in diverse classrooms
- Develop knowledge, skills, and professional behaviors across secondary settings, examine the nature of mathematics, how mathematics should be taught, and how students learn mathematics; and observe and analyze a range of approaches to mathematics teaching and learning focusing on tasks, discourse, environment, and assessment

PROFESSIONAL STANDARDS

NCTM Secondary Mathematics Standard 1, Content Knowledge: Preservice teacher candidates: demonstrate and apply knowledge of major mathematics concepts, algorithms, procedures, applications in varied contexts, and connections within and among mathematical domains (Number, Algebra, Geometry, Trigonometry, Statistics, Probability, Calculus, and Discrete Mathematics) as outlined in the NCTM CAEP Mathematics Content for Secondary.

NCTM Secondary Mathematics Standard 2, Mathematical Practices: Effective teachers of secondary mathematics solve problems, represent mathematical ideas, reason, prove, use mathematical models, attend to precision, identify elements of structure, generalize, engage in mathematical communication, and make connections as essential mathematical practices. They understand that these practices intersect with mathematical content and that understanding relies on the ability to demonstrate these practices within and among mathematical domains and in their teaching.

NCTM Secondary Mathematics Standard 3, Content Pedagogy: Effective teachers of secondary mathematics apply knowledge of curriculum standards for mathematics and their relationship to student learning within and across mathematical domains. They incorporate research-based mathematical experiences and include multiple instructional strategies and mathematics-specific technological tools in their teaching to develop all students' mathematical understanding and proficiency. They provide students with opportunities to do mathematics – talking about it and connecting it to both theoretical and real-world contexts. They plan, select, implement, interpret, and use formative and summative assessments for monitoring student learning, measuring student mathematical understanding, and informing practice.

NCTM Secondary Mathematics Standard 4, Mathematical Learning Environment: Effective teachers of secondary mathematics exhibit knowledge of adolescent learning, development, and behavior. They use this knowledge to plan and create sequential learning opportunities grounded in mathematics education research where students are actively engaged in the mathematics they are learning and building from prior knowledge and skills. They demonstrate a positive disposition toward mathematical practices and learning, include culturally relevant perspectives in teaching, and demonstrate equitable and ethical treatment of and high

expectations for all students. They use instructional tools such as manipulatives, digital tools, and virtual resources to enhance learning while recognizing the possible limitations of such tools.

NCTM Secondary Mathematics Standard 7, Secondary Mathematics Field Experiences and Clinical Practices: Effective teachers of secondary mathematics engage in a planned sequence of field experiences and clinical practice under the supervision of experienced and highly qualified mathematics teachers. They develop a broad experiential base of knowledge, skills, effective approaches to mathematics teaching and learning, and professional behaviors across both middle and high school settings that involve a diverse range and varied groupings of students. Candidates experience a full-time student teaching/internship in secondary mathematics directed by university or college faculty with secondary mathematics teaching experience or equivalent knowledge base.

REQUIRED TEXTS AND MATERIALS

Access to the following materials is required:

Brahier, D.J. (2012). *Teaching secondary and middle school mathematics* (4th edition). Boston: Pearson Education Inc.

Brahier, D. J. (2001). *Assessment in middle and high school mathematics: A teacher's guide*. New York: Eye on Education.

You will also complete additional readings as assigned. All additional readings will be uploaded to Blackboard.

COURSE ASSIGNMENTS AND EXPECTATIONS

The following assignments will help you (and me) to gauge your development throughout the course:

Assessment	Percentage of Grade
Participation and Preparation (including weekly and smaller assignments)	15%
Peer Teaching	10%
Assessment Assignment	15%
Micro-Teaching	10%
Field Work Assignment	15%
Unit Plan Assignment (differentiated by undergrad/graduate level)	20%
Individual Plan	10%

Participation and Preparation

The participation of each class member is vitally important. If you do not come prepared to

discuss the readings, to share you work on a given assignment, and to participate in the activities of the day the entire class will suffer. You **must** commit to be coming to every class on time, being prepared for the evening's activities, and being ready to participate. You can expect that, in addition to work on the larger projects outlined below, there will be weekly readings and assignments that will fall into this category. If, however, there is an emergency and you cannot make it to class, you **must email me ahead of time** and submit all assignments electronically before the end of class.

Due Dates, Late Assignments, and Revised Assignments

Due Dates: All assignments are due by 11:59pm of the date assigned.

Late Assignments: If an assignment is not uploaded by 11:59pm of the date assigned, and you have not contacted me to receive an extension, then the assignment will be considered late. All late assignments will receive a *one-letter grade penalty*. If you know that you are going to have an issue with completing an assignment on time, please **notify me ahead of time** to avoid this late grade penalty.

Revised Assignments: When students earn less than 80% on an assignment, I often offer them the opportunity to revise and resubmit. As long as students meet the guidelines for resubmission, students may earn up to 75% of the missed points on the assignment. Please keep in mind that it requires additional work to grade revised assignments, so they will require additional time to re-grade.

Assignment Descriptions

Unit Plan and Presentation

Throughout this semester, you will explore many issues related to the teaching and learning of mathematics. In this culminating assignment, you will have the opportunity to use the knowledge, skills, and understandings you've gained in this and the previous semester in the creation of a complete unit of study. Within this unit plan, you will be asked to design lessons that pay attention to the use of technology, the development of student understanding of mathematics content, various standards documents, assessment of student understanding, and ways to differentiate instruction for diverse groups of learners. After submission of the unit plan, you will present your plan to your peers so that the entire class can begin to create a collection of teaching ideas for various content areas within secondary mathematics. **The requirement for this assignment differs for graduate and undergraduate students. You must pass this assignment to continue in the program.**

Individualized Lesson Plan

You will develop an individualized plan for a child with developmental, learning, physical, or linguistic differences within the context of the general environment and curriculum. This will count as one of the lessons in your unit plan.

Assessment Assignment

In this assessment, you will apply what you learned about assessment to your unit plan. Building on what you learned, you will further develop your assessment plan for the unit and, in so doing, develop two assessment instruments and corresponding grading rubrics. One assessment will be a quiz assessing the goals and objectives from one of the lessons in your unit plan. Another assessment will be an alternative form of assessment used to assess the

goals and objectives of the unit.

Peer Teaching Activity/Mini-Task Lead
You will record your facilitation of a short task or portion of a task and upload the video clips to Edthena. Then you will code the videos using codes discussed in class and write reflections/self-assessments based on the video clips. Edthena is an online tool that uses video coding as a means for feedback and reflection. All candidates taking Methods II are required to use Edthena starting in the fall 2015.

Micro-Teaching Assignment
In this assignment, you will apply all that you learned about planning and orchestrating classroom discourse to the development, implementation, and reflection upon a lesson surrounding a mathematics concept covered in secondary mathematics classrooms. The instructor will assign the lesson topic. The implementation of the lesson will be video-recorded so as to facilitate the reflection process. This process is valuable to you as you teach and reflect on your teaching of a lesson.

Field Work Assignment
You will complete 15 hours of field work and keep a log of these hours for submission at the end of the semester. During this time, you will remain with one teacher and slowly begin to interact with students. By the
end of the experience you will have taught a whole, or part of a whole, lesson. You will submit the lesson and
reflect upon it effectiveness. This assignment provides you with an excellent opportunity to work with real students as you prepare to become a teacher.

Communication
You must regularly check your GMU email and Blackboard: https://courses.gmu.edu.

Evaluation
Final course grades will be assigned based upon weighted percentages as indicated by the Course Expectations.

A	93-100%
A-	90-92%
B+	88-89%
B	80-87%
C	70-79%
F	Below 70%

TK20 PERFORMANCE-BASED ASSESSMENT SUBMISSION REQUIREMENT
Every student registered for any Secondary Education course with a required performance-based assessment is required to submit this assessment, Lesson Plan to Tk20 through Blackboard (regardless of whether the student is taking the course as an elective, a onetime course or as part of an undergraduate minor). Evaluation of the performance-based assessment by the course instructor will also be completed in Tk20 through Blackboard. Failure to submit the assessment to Tk20 (through Blackboard) will result in the course instructor reporting the course grade as

Incomplete (IN). Unless the IN grade is changed upon completion of the required Tk20 submission, the IN will convert to an F nine weeks into the following semester.

GMU POLICIES AND RESOURCES FOR STUDENTS

a. Students must adhere to the guidelines of the George Mason University Honor Code (See **http://oai.gmu.edu/the-mason-honor-code/**).

b. Students must follow the university policy for Responsible Use of Computing (See **http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/**).

c. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.

d. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (See **http://caps.gmu.edu/**).

e. Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services and inform their instructor, in writing, as soon as possible. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (See **http://ods.gmu.edu/**).

f. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.

g. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing (See **http://writingcenter.gmu.edu/**).

PROFESSIONAL DISPOSITIONS

Students are expected to exhibit professional behaviors and dispositions at all times.

CORE VALUES COMMITMENT

The College of Education & Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: **http://cehd.gmu.edu/values/**.

For additional information on the College of Education and Human Development,

Graduate School of Education, please visit our website http://gse.gmu.edu/.

Tentative Schedule

The dates are subject to change dependent on the progress of the course. I will not move due dates for major assignments to an earlier date, only a later date if necessary. Additional smaller assignments and readings may be made each week. Sometimes students will read different articles or chapters and share their understandings with the class.

Date	Topic	Text	Assignment Due
Jan 20	**The Big Picture**: Course Goals	NCTM (2013) Bartell & Meyer (2008)	
Jan 27	**Facilitating Mathematical Discourse** **Staging a Unit**	Boaler & Broadie (2005) Brahier: pp. 136-141	Select Unit Plan topic
Feb 3	**Facilitating Mathematical Discourse**	Hoffman et al. (2009)	Submit Unit Topic Concept Map
Feb 10	**Facilitating Mathematical Discourse** - Proof & Argumentation - Geometric Habits of Mind	**Peer teaching activity (focus on questioning) NCTM (2012)	Select appropriate NCTM, VA SOL, and CCSM standards that align to Unit and Assessment Plans Submit Backwards Design table for Unit Plan
Feb 17	**Assessment:** - Role of Assessment - NCTM Assessment Standards	Brahier (2012) 277-288 Brahier (2012): pp. 311-321	**Peer teaching analysis should be uploaded to Edthena

	Meaningful Assessment and Effective Questioning - Open Questions - Open-Middled - Closed Questions	Brahier (2001, assessment book) Chapter 1 Dekker (2007) ** Peer Teaching Activity #1 (focus on Geometric Thinking)	First lesson plan for Unit Plan due (Upload to **Blackboard**)
Feb 24	**Assessment** - Creating Rubrics for Alternate Assessments - Scoring Alternate Assessments	Brahier pp. 321-333 Select one of the following: Goetz (2005) Stutzman & Race (2004)	Select Micro-teaching Topic (in class) Upload Peer Teaching analysis to Edthena
Mar 2	**Assessment***:* - Alternative Assessments - The Role of Homework	Brahier (2001): Chapters 2 and 3 ** Peer Teaching Activity #2 (focus on Questioning)	Drafts of open, open-middled, and closed questions for Unit Plan due (Upload to **Blackboard** and bring copy to class.)
Mar 9	Spring Break – No Class		
Mar 16	**Assessment***:* - Determining Final Grades - Assessment Plans - Standardized Assessment	Brahier (2001): Chapters 4 and 5	Peer Teaching analysis due to Edthena Bring Alternative Assessment DRAFT to class
Mar 23	**Differentiation, Equity, and Mathematics** - Differentiation - NCTM's Equity Principle - Equity concerns in Math Education	Brahier (2012) Chapter 12	

Mar 30	**Honoring Diversity and Equity in Teaching Mathematics (cont.)** - Complex Instruction	Cohen et al. (1999) – Grad Only Nasir et al. (2013)	**Assessment Plan Due** (Upload to **Blackboard**)
Apr 6	**Differentiation and Honoring Diversity and Equity in Teaching Mathematics: Exceptional Learners** - Special Education - Gifted Education	Selected readings – see course site (different readings for Grad and UG) **Microteaching Presentations 1 & 2**	
April 13	**Differentiation and Discourse (cont.)** - ELL students and Mathematics Instruction	Selected readings – see course site (different readings for Grad and UG) **Microteaching Presentations 3&4**	**Unit Plan Due**
Apr 20	**Micro-teaching Presentations**	**Microteaching Presentations 5 & 6**	**Microteaching lesson plan due**
Apr 27	**The Mathematics Teacher and the Community**	Brahier Chapter 13 **Microteaching Presentation 7**	**Microteaching lesson plan due**
May 4	**Complete and submit final assignments**		**Submit Field Experience Reflections and Micro-teaching Reflections**

UNIT PLAN
Scoring Rubric

The unit plan will be evaluated using two different rubrics: *InTASC* and *NCTM*. Together, these two rubrics evaluate teacher candidates' ability to demonstrate a variety of NCTM SPA standards for the Planning assessment.

For each of the standards the following scoring criteria are used:
0 – unacceptable
1 – marginal
2 – meets expectations
3 – exceeds expectations

In order to pass this assignment, teacher candidates need to earn a mean score of at least 2.0 on <u>each</u> of the rubrics. Should a unit plan earn less than a mean score of 2.0 on <u>either</u> rubric, the teacher candidate will be asked to redo the unit plan until the minimum standard is met.

EDCI 472/672 Unit Plan Rubric

INTASC Standards

	Exceeds Expectations (3 points)	**Meets Expectations (2 points)**	**Approaches Expectations (1 point)**	**Does Not Meet Expectations**
Lesson Construction and Formatting	Lesson and assignment are written in alignment with specified formatting. All accompanying materials/resources are included. Each resource is clear and appealing to students	Lesson and assignment are written in alignment with specified formatting. All accompanying materials/resources are included. Some resources are not clear and/or appealing to students.	Lesson and assignment are written in alignment with specified formatting. Some materials are missing and/or all materials are unclear to students.	Lesson and assignment are not written in alignment with specified formatting and/or all submitted accompanying materials are not clear to students.

Goals/Objectives *InTASC: 7*	All goals and objectives are written to describe learning ***outcomes*** and are aligned with state and NCTM standards. None are extraneous.	Some objectives/goals are not written to describe learning ***outcomes***. Most of the objectives/goals are related to standards. None are extraneous.	Objectives/goals are not written as learning ***outcomes***. Some of the objectives/goals are related to standards. Some are extraneous.	Objectives/goals are missing, unclear, or are unrelated to standards. Some or all are extraneous.
Content *InTASC: 1*	Instruction focuses on the "big ideas" of mathematics and shows connections between and among concepts. Content is represented accurately and developed logically.	Instruction focuses on the "big ideas" of mathematics but some connections between and among concepts may be missing. Content is represented accurately but, at times, may have gaps in its logical development.	Instruction does not focus on the "big ideas" of mathematics and does not show connections between and among concepts. Content is, represented accurately but, at time, may have gaps in its logical development.	Instruction does not focus on the "big ideas" of mathematics and does not show connections between and among concepts. Content is not represented accurately and/or developed logically.
Student Learning *InTASC: 2*	All planned activities are developmentally appropriate and provide opportunities for students to engage in meaningful exploration of mathematics in the development of conceptual understanding and procedural knowledge.	Most planned activities are developmentally appropriate and provide opportunities for students to engage in meaningful exploration of mathematics in the development of conceptual understanding and procedural knowledge.	Some planned activities are developmentally appropriate and provide opportunities for students to engage in meaningful exploration of mathematics in the development of conceptual understanding and procedural knowledge.	None of the planned activities are developmentally appropriate nor do they provide opportunities for students to engage in meaningful exploration of mathematics in the development of conceptual understanding and procedural knowledge.

Instructional Activities *InTASC:* *4*	Instruction regularly incorporates variety of activities, engages students in high-level thinking, is problem-/inquiry-based, and is creatively designed.	Instruction often incorporates a variety of activities, engages students in high-level thinking, is problem-/inquiry-based, and is creatively designed.	Instruction rarely incorporates a variety of activities, engages students in high-level thinking, is problem-/inquiry-based, and is creatively designed.	Instruction does not incorporate a variety of activities, engage students in high-level thinking, is not problem-/inquiry- based, and is not creatively designed.

NCTM Secondary Mathematics SPA Standards

***NCTM* Standard 1a: Content Knowledge** Candidates should demonstrate and apply knowledge of mathematical content. Plans include opportunities for students to do the following:				
Standard	**Exceeds Expectations (3 points)**	**Meets Expectations (2 points)**	**Approaches Expectations (1 point)**	**Does Not Meet Expectations (0 points)**
1a.1 Demonstrate knowledge of major mathematical concepts, algorithms, and procedures	Lessons are designed to address the big ideas of secondary mathematics content. Throughout, students are consistently engaged in activities that address all 3 indicators.	Lessons are designed to address the big ideas of secondary mathematics content Students are somewhat engaged in activities that address all 4 indicators.	Lessons are designed to address the big ideas of secondary mathematics content. Students are somewhat engaged in activities that address most of the indicators.	Lessons are not designed to address the big ideas of secondary mathematics content. Students are not engaged in activities that address most of the indicators.
1a.2 Make connections between and among mathematical domains	Lessons are designed to address the big ideas of secondary mathematics content. Throughout, students are consistently	Lessons are designed to address the big ideas of secondary mathematics content Students are somewhat engaged in activities that	Lessons are designed to address the big ideas of secondary mathematics content. Students are somewhat engaged in	Lessons are not designed to address the big ideas of secondary mathematics content. Students are not engaged in activities that address most of the indicators.

	engaged in activities that address all 3 indicators.	address all 4 indicators.	activities that address most of the indicators.	
1a.3 Apply mathematics to varied contexts	Lessons are designed to address the big ideas of secondary mathematics content. Throughout, students are consistently engaged in activities that address all 3 indicators.	Lessons are designed to address the big ideas of secondary mathematics content Students are somewhat engaged in activities that address all 4 indicators.	Lessons are designed to address the big ideas of secondary mathematics content. Students are somewhat engaged in activities that address most of the indicators.	Lessons are not designed to address the big ideas of secondary mathematics content. Students are not engaged in activities that address most of the indicators.

***NCTM* Standard 2: Mathematical Practices** Candidates solve problems, represent mathematical ideas, reason, prove, use mathematical models, attend to precision, identify elements of structure, generalize, engage in mathematical communication, and make connections as essential mathematical practices. Plans include opportunities for students to engage in the following:				
Standard	**Exceeds Expectations (3 points)**	**Meets Expectations (2 points)**	**Approaches Expectations (1 point)**	**Does Not Meet Expectations (0 points)**
2a Use problem solving to develop conceptual understanding, make conjectures and generalizations, and apply and adapt a variety of strategies	Lessons are designed to fully engage students in activities that exhibit the mathematical practice.	Lessons are designed to partially engage students in activities in the mathematical practice.	Lessons are designed to engage students in activities that minimally engage students in the mathematical practice.	Lessons are not designed to engage students in activities that address the mathematical practice.
2b Reason abstractly and quantitatively with attention to precision	Lessons are designed to fully engage students in activities that exhibit the mathematical	Lessons are designed to partially engage students in activities in the mathematical	Lessons are designed to engage students in activities that minimally	Lessons are not designed to engage students in activities that address the mathematical

	practice.	practice.	engage students in the mathematical practice.	practice.
2c Formulate, represent, analyze, and interpret mathematical models	Lessons are designed to fully engage students in activities that exhibit the mathematical practice.	Lessons are designed to partially engage students in activities in the mathematical practice.	Lessons are designed to engage students in activities that minimally engage students in the mathematical practice.	Lessons are not designed to engage students in activities that address the mathematical practice.
2d Use the language of mathematics (e.g., vocabulary and symbols) to communicate mathematical ideas to others	Lessons are designed to fully engage students in activities that exhibit the mathematical practice.	Lessons are designed to partially engage students in activities in the mathematical practice.	Lessons are designed to engage students in activities that minimally engage students in the mathematical practice.	Lessons are not designed to engage students in activities that address the mathematical practice.
2e Make connections between mathematical domains and the practices of problem solving, reasoning, communicating, connecting, and representing	Lessons are designed to fully engage students in activities that exhibit the mathematical practice.	Lessons are designed to partially engage students in activities in the mathematical practice.	Lessons are designed to engage students in activities that minimally engage students in the mathematical practice.	Lessons are not designed to engage students in activities that address the mathematical practice.
2f Model how the development of mathematical understanding within and among mathematical domains intersects with the mathematics practices of	Lessons are designed such that mathematical content and understanding are fully integrated. with mathematics practice standards	Lessons are designed such that mathematical content and understanding are somewhat integrated. with mathematics practice standards	Lessons are designed such that mathematical content and understanding are minimally integrated. with mathematics practice standards	Lessons are designed such that mathematical content and understanding are NOT integrated. with mathematics practice standards

problem solving, reasoning communicating, connecting, and representing.				

***NCTM* Standard 3: Content Pedagogy** Candidates apply knowledge of curriculum standards for mathematics and their relationship to student learning Lesson Plans include evidence of the following:				
Standard	**Exceeds Expectations (3 points)**	**Meets Expectations (2 points)**	**Approaches Expectations (1 point)**	**Does Not Meet Expectations (0 points)**
3a Applying knowledge of curriculum standards for secondary mathematics and relationship to student learning within the lessons	Lessons are designed to demonstrate exceptional knowledge of the content pedagogy standard.	Lessons are designed to demonstrate proficient knowledge of the content pedagogy.	Lessons are designed to minimally demonstrate knowledge of content pedagogy.	Lessons are not designed to demonstrate knowledge of the content pedagogy standard.
3b Use of research to create rich mathematical learning experiences	Lessons are designed to demonstrate exceptional knowledge of the content pedagogy standard.	Lessons are designed to demonstrate proficient knowledge of the content pedagogy.	Lessons are designed to minimally demonstrate knowledge of content pedagogy.	Lessons are not designed to demonstrate knowledge of the content pedagogy standard.
3c1 Use of instructional technologies to help students build conceptual understanding and procedural fluency	Lessons are designed to demonstrate exceptional knowledge of the content pedagogy standard.	Lessons are designed to demonstrate proficient knowledge of the content pedagogy.	Lessons are designed to minimally demonstrate knowledge of content pedagogy.	Lessons are not designed to demonstrate knowledge of the content pedagogy standard.
3c2 A variety of strategies and	Lessons are designed to demonstrate exceptional	Lessons are designed to demonstrate proficient	Lessons are designed to minimally demonstrate	Lessons are not designed to demonstrate knowledge of

differentiated instruction for diverse populations	knowledge of the content pedagogy standard.	knowledge of the content pedagogy.	knowledge of content pedagogy.	the content pedagogy standard.
3d Opportunities for communication about mathematics and to make connections among mathematics other content areas, and the real world.	Lessons are designed to demonstrate exceptional knowledge of the content pedagogy standard.	Lessons are designed to demonstrate proficient knowledge of the content pedagogy.	Lessons are designed to minimally demonstrate knowledge of content pedagogy.	Lessons are not designed to demonstrate knowledge of the content pedagogy standard.
3e Implement techniques related to student engagement and communication (e.g, selecting high-quality tasks, guiding mathematical discussions, identifying key mathematical ideas, addressing student misconceptions, and employing a range of strategies.)	Lessons are designed to demonstrate exceptional knowledge of the content pedagogy standard.	Lessons are designed to demonstrate proficient knowledge of the content pedagogy.	Lessons are designed to minimally demonstrate knowledge of content pedagogy.	Lessons are not designed to demonstrate knowledge of the content pedagogy standard.
3f Use of formative and summative assessment to inform instruction	Lessons are designed to demonstrate exceptional knowledge of the content pedagogy standard.	Lessons are designed to demonstrate proficient knowledge of the content pedagogy.	Lessons are designed to minimally demonstrate knowledge of content pedagogy.	Lessons are not designed to demonstrate knowledge of the content pedagogy standard.

***NCTM* Standard 4: Mathematical Learning Environment**
Candidates exhibit knowledge of adolescent learning, development, and behavior and use this knowledge to create learning opportunities that are grounded in mathematics education research in which students are actively learning and building on prior knowledge and skills. Plans include:

Standard	Exceeds Expectations (3 points)	Meets Expectations (2 points)	Approaches Expectations (1 point)	Does Not Meet Expectations (0 points)
4a Knowledge of adolescent learning, development, and behavior and foster positive disposition toward mathematics learning	Lessons are designed to demonstrate exceptional knowledge of fostering a productive mathematics-learning environment according to the standard.	Lessons are designed to demonstrate proficient knowledge of fostering a productive mathematics-learning environment. Students are somewhat engaged in activities that address the indicator.	Lessons are designed to demonstrate developing knowledge of fostering a productive mathematics-learning environment. Students are somewhat engaged in activities that address the indicator.	Lessons are not designed to demonstrate knowledge of fostering a productive mathematics-learning environment. Students are not engaged in activities that address the indicator.
4b Developmentally appropriate, sequential, and challenging learning opportunities	Lessons are designed to demonstrate exceptional knowledge of fostering a productive mathematics-learning environment according to the standard.	Lessons are designed to demonstrate proficient knowledge of fostering a productive mathematics-learning environment. Students are somewhat engaged in activities that address the indicator	Lessons are designed to demonstrate developing knowledge of fostering a productive mathematics-learning environment. Students are somewhat engaged in activities that address the indicator.	Lessons are not designed to demonstrate knowledge of fostering a productive mathematics-learning environment. Students are not engaged in activities that address the indicator.
4c Knowledge of individual differences, including cultural and language diversity	Lessons are designed to demonstrate exceptional knowledge of fostering a productive mathematics-learning environment	Lessons are designed to demonstrate proficient knowledge of fostering a productive mathematics-learning environment.	Lessons are designed to demonstrate developing knowledge of fostering a productive mathematics-learning environment.	Lessons are not designed to demonstrate knowledge of fostering a productive mathematics-learning environment. Students are not

	according to the standard.	Students are somewhat engaged in activities that address the indicator	Students are somewhat engaged in activities that address the indicator.	engaged in activities that address the indicator.
4e Use of tools (e.g., manipulatives, physical models, drawings, and mathematics specific technologies) to enhance teaching and learning	Lessons are designed to demonstrate exceptional knowledge of fostering a productive mathematics-learning environment according to the standard.	Lessons are designed to demonstrate proficient knowledge of fostering a productive mathematics-learning environment. Students are somewhat engaged in activities that address the indicator	Lessons are designed to demonstrate developing knowledge of fostering a productive mathematics-learning environment. Students are somewhat engaged in activities that address the indicator.	Lessons are not designed to demonstrate knowledge of fostering a productive mathematics-learning environment. Students are not engaged in activities that address the indicator.

Student Name:
Semester:

Rubric Ratings:

INTASC Standard	Rating
1. Content	
2. Student Learning	
3. Diverse Learners	
4. Instruction	
5. Learning Environment	
6. Communication	
7. Planning	
8. Assessment	
9. Reflection	
10. Collaboration	
Mean Score	

NCTM Standard	Rating
Content Knowledge	
Mathematical Practices	
Content Pedagogy	
Mathematical Learning Environment	
Mean Score	

A minimum mean rating of 2.0 is required. Any standards receiving a zero rating must be re-submitted.

"Approaches Expectations" or better rating in all standards: _____YES _____NO

Strengths of the Unit Plan:

Areas to Further Develop:

IMPORTANT INFORMATION FOR LICENSURE COMPLETION

Student Clinical Practice: Internship Requirements

Testing

Beginning with Spring 2015 internships, **all** official and passing test scores must be submitted and in the Mason system (i.e. Banner/PatriotWeb) by the internship application deadline. Allow a minimum of six weeks for official test scores to arrive at Mason. Testing too close to the application deadline means scores will not arrive in time and the internship application will not be accepted.

Required tests:

- Praxis Core Academic Skills for Educators Tests (or qualifying substitute)
- VCLA
- Praxis II (Content Knowledge exam in your specific endorsement area)

For details, please check http://cehd.gmu.edu/teacher/test/

Endorsements

Please note that ALL endorsement coursework must be completed, with all transcripts submitted and approved by the CEHD Endorsement Office, prior to the internship application deadline. Since the internship application must be submitted in the semester prior to the actual internship, please make an appointment to meet with the Endorsement Specialist and plan the completion of your Endorsements accordingly.

CPR/AED/First Aid

Beginning with spring 2015 internships, verification that the Emergency First Aid, CPR, and Use of AED Certification or Training requirement must be submitted and in the Mason system (i.e. Banner/PatriotWeb) by the application deadline. Students must submit one of the "acceptable evidence" documents listed at http://cehd.gmu.edu/teacher/emergency-first-aid to CEHD Student and Academic Affairs. In order to have the requirement reflected as met in the Mason system, documents can be scanned/e-mailed to CEHDacad@gmu.edu or dropped-off in Thompson Hall, Suite 2300.

Background Checks/Fingerprints

All local school systems require students to complete a criminal background check through their human resources office (not through George Mason University) **prior to beginning the internship**. Detailed instructions on the process will be sent to the student from either the school system or Mason. Students are **strongly advised** to disclose any/all legal incidents that may appear on their records. The consequence of failing to do so, whether or not such incidents resulted in conviction, is termination of the internship.

Please Note

Your G-Number must be clearly noted (visible and legible) on the face of the document(s) that you submit.

Application

The internship application can be downloaded at http://cehd.gmu.edu/teacher/internships-field-experience

Deadlines

Spring internship application:

- Traditional: September 15
- On-the Job: November 1

Fall internship application:

- Traditional: February 15
- On-the Job: May 1