EDUC 362 Z
CURRICULUM AND INSTRUCTION IN MATHEMATICS
MORAVIAN COLLEGE
FALL 2015

INSTRUCTOR:
Dr. Erin M. Smith
smithe1@moravian.edu
610-861-1556 (office)
651-592-0334 (cell)
PPHAC 324

CLASS HOURS/LOCATION:
Wednesday 6:30 – 9:30 p.m., PPHAC 330

OFFICE HOURS:
M & F 10:30–12:30 p.m., W 4:00–6:00 p.m.,
and by appointment

"Holding the mind to a subject is like holding a ship to its course;
it implies constant change of place combined with unity of direction."
(Dewey, 1910)

"The map is not the territory."
(Alfred Korzybski, 1933)

ESSENTIAL QUESTIONS:

1. **What does it mean to do, teach, and learn mathematics in the 21st century?**
2. **How do teachers orchestrate the learning environment to ensure mathematical success for *all* students?**
3. **What *is* the mathematics curriculum?**
4. **How do national trends influence local curriculum?**
5. **How do teachers' beliefs, decisions, and actions impact learners and learning?**
6. **How do teachers plan for instruction with a focus on learning?**
7. **How can assessment become not merely the *end* of, but rather a *means* to learning?**

OBJECTIVES:

- To develop and practice secondary mathematics teaching skills which promote genuine learning and ensure mathematical success for all students in a supportive environment
- To connect theory and practice by preparing for, engaging in, and reflecting on the field experience
- To investigate research-based, current best practices in mathematics instruction
- To examine, discuss, and apply the NCTM Principles and Standards, Pennsylvania State Standards and Assessment Anchors; NCTM Principles to Actions; Common Core State Standards for Mathematics (CCSSM), and Standards for Mathematical Practice
- To effectively plan, construct, execute, and reflect on mathematics unit plans, lesson plans, and assessments that serve all learners
- To create a professional e-portfolio component, your Philosophy of Mathematics Education: Mathematical Success for All statement
- To articulate your knowledge and beliefs about mathematics, teaching mathematics, and learning mathematics

Dewey, J. (1910). *How we think*. Boston, MA: D. C. Heath.
Korzybski, A. (1933). A non-Aristotelian system and its necessity for rigour in mathematics and physics. *Science and Sanity*, 747–61.

PDE GUIDELINES FOR MATHEMATICS CERTIFICATION 7-12
• met through EDUC 362 course and field work:

II. Performances
Preservice teachers must demonstrate knowledge and competence in fostering student learning through:

A. **Managing the instructional environment** in order to:
• communicate challenging learning expectations to each student,
• establish and maintain rapport with students and promote mutual respect among students,
• instill in all students a belief that they can succeed in mathematics,
• establish and maintain consistent standards of classroom behavior,
• make the physical environment safe and conducive to learning,
• model school to career attributes and behaviors

B. **Long-range and short-range planning of instruction**, done independently and in collaboration with other educators, based upon:
• mathematics subject matter,
• students and the community,
• Pennsylvania Academic Standards,
• content analysis with specific objectives,
• instructional methods, including materials and activities,
• results of student assessments

C. **Selecting, adapting and implementing a variety of instructional strategies** ranging from computational exercises to complex problem solving to "essay-style" homework, class assignments, projects, and utilizing traditional tools as well as modern technologies

D. **Selecting, analyzing, and modifying instructional materials to meet the needs of diverse learners**

E. **Assessing and evaluating student's conceptual understanding of content** through a variety of contextual settings, providing formative feedback to align instructional strategies to individual student needs

III. Professionalism
Preservice teachers must demonstrate knowledge and competencies that foster professionalism in school and community settings including:

A. Professional organizations, journals, and other resources for professional development

B. Integrity and ethical behavior, professional conduct as stated in Pennsylvania's Code of Professional Practice and Conduct for Educators; and local, state, and federal laws and regulations

C. Establish collaborative relationships with colleagues of the elementary, secondary and higher education levels to improve student learning

D. Communicate effectively with parents or guardians, other agencies and the community at large to support learning by all students

http://www.education.pa.gov/Documents/Teachers-Administrators/Certification%20Preparation%20Programs/Specific%20Program%20Guidelines/Mathematics.pdf
PDE SECONDARY PROGRAM GUIDELINES

EDUC 362 coursework [C], field experience [F], or both [C & F] will facilitate understanding of the organizational structure of the high school, adolescent development, subject matter and pedagogy, and assessment. Likewise, preservice teachers should uphold professional standards and engage in lifelong learning and professional development. Each of these competencies embraces the notion of the school and classroom as a community of learners which maintains that reflection is at the core of successful practice.

I. Secondary Education – A guiding principle for the secondary level is to prepare professionals who support student learning consistently in a variety of contexts and with a variety of means. Candidates will demonstrate their abilities in and understanding of:

A. Organizational Structure of the High School

1. Make curricular decisions that are grounded in the social, philosophical, and historical foundations of education. [C]
2. Engage adolescents in activities related to their interpersonal, community, and societal responsibilities.[F]
3. Develop classrooms as communities of practice that are learner-oriented. [C & F]
5. Participate in professional organizations related to a subject-area specialization, academic discipline, and/or teaching. [C]

B. Adolescent Development

1. Recognize and implement the major concepts, principles, theories, and research related to adolescent cognitive, social, sexual, emotional, and moral development. [C & F]
2. Design and implement strategies that encourage students' positive self-esteem, self-efficacy, and motivation. [C & F]
3. Identify and respect the range of individual and cultural differences of all adolescents and the implications of those differences in teaching and learning. [C & F]
7. Create and support learning environments that promote the healthy development of all adolescents. [C & F]

II. Subject-Matter Content and Pedagogy

B. Pedagogy

1. Use effective instructional principles, especially those that draw on the research on pedagogical content knowledge in course content. [C & F]
2. Employ teaching and learning strategies that consider and capitalize upon the developmental characteristics of all adolescents. [F]
4. Incorporate technology into instruction appropriately. [F]
6. Make decisions about curriculum and resources that reflect an understanding of adolescent development. [C & F]
7. Utilize subject-specific methodologies. [C & F]
8. Deliver curriculum that is relevant, challenging, integrative, and exploratory. [C & F]
9. Incorporate adolescents' ideas, interests, and experiences into instruction. [C & F]
10. Design successful interventions responsive to the needs of individual students. [C & F]
11. Integrate technology and other resources appropriately in order to prepare students for higher education, full citizenship, and the workforce. [C & F]
12. Apply PA core standards into both short-term and long-term instructional goals. [C & F]
13. Create lessons that support literacy across the curriculum. [C & F]
14. Prepare students to gain, process, and use information in different contexts. [C & F]
15. Design educational experiences that help students communicate using various tools and means. [C]

16. Create lessons that demonstrate an understanding of literacy both broadly and in discipline contexts. [C & F]
18. Demonstrate the adaptation of educational or subject-specific research in lessons. [C & F]
19. Differentiate instruction, assessment, and management strategies to represent a broad spectrum of learning abilities, learning styles, multiple intelligences and interests. [C & F]
20. Develop inclusionary practices that respect differences and encourage students to work together to maximize their own and one another's learning. [C]

III. Assessment

A. Utilize assessment practices which match instructional strategies, are culturally relevant, and authentically measure student performance. [C]
B. Continuously monitor the results of interventions and alter instruction accordingly. [F]
C. Use multiple assessments (authentic screening, diagnostic, formative, benchmark and summative) that are developmentally appropriate for adolescent learners including graduation and end of course examinations. [C & F]
E. Use assessment data to guide instruction. [C & F]
G. Use multiple assessment strategies that effectively measure student mastery of the curriculum in more than one way. [C]
H. Design assessments that target academic standards and Assessment Anchor Content Standards in subject areas. [F]
I. Develop assessments that impact instruction, facilitate learning communities, and support diverse students' development and learning. [C & F]
J. Apply assessments that help reveal readiness in making the transition from school (to work, to higher education, to military service, to full citizenship, etc.). [F]

IV. Professionalism

A. Act as positive role models, coaches, and mentors for all adolescents. [F]
B. Communicate deep content knowledge in the subjects taught. [C & F]
E. Utilize research and data-based decision-making. [C & F]
G. Develop effective teaching practices and focus on continual improvement within the teacher-preparation apprenticeship model. [C & F]
H. Understand and comply with Pennsylvania's *Code of Professional Practice and Conduct for Educators*.[F]

http://www.education.pa.gov/Documents/Teachers-Administrators/Certification%20Preparation%20Programs/Framework%20Guidelines%20and%20Rubrics/Secondary%20Grades%207-12%20Program%20Framework%20Guidelines.pdf

PRESERVICE TEACHER COMPETENCIES

PDE Accommodations and Adaptations from Students with Disabilities in an Inclusive Setting (SWD) and English Language Learners (ELL) must be met with evidence from assignments completed in this course as follows:

- Demonstrate an understanding of and ability to plan for: type, identification and characteristics of different types of disabilities, as well as effective, evidenced-based instructional practices and adaptations. (SWD I A 1)
- Recognize patterns of normal physical developmental milestones and how patterns of students with disabilities may be different, and plan effectively for possible accommodations and/or modifications which may be necessary to implement effective instructional practices. (SWD I B 2)

- Recognize areas of development for students with disabilities and plan effectively for: interpersonal processes, forming and maintaining relationships (including parent-child, caregiver, peer, friend, sibling), and attachment models and their effect on learning. (SWD I B 3 A)
- Apply principles in social competence, social withdrawal, social role formation and maintenance, and prosocial behaviors, and aggression as they affect learning. (SWD I B 3 B)
- Recognize patterns of normal behavioral milestones and how patterns of students with disabilities may be different, and plan effectively for positive teaching of appropriate behaviors that facilitate learning. (SWD I B 4)
- Demonstrate the use of formal and informal assessment data for instructional, behavioral and possible eligibility decisions based on the type of assessment, level of the students being assessed, and the point and quality of instruction. (SWD I C 1)
- Demonstrate an understanding of the types of assessments used (e.g., screening, diagnostic, formative, summative) and the purpose of each assessment in a data-based decision making process. (SWD I C 2)
- Demonstrate an understanding of the multi-disciplinary evaluation process and an ability to articulate the findings presented in an evaluation report including grade-level equivalents, percentile rank, standard scores, and stanines. (SWD I C 3)
- Demonstrate an understanding of the components of the Individualized Education Plan (IEP) process, with an emphasis on understanding measurable goals based on present levels, specially designed instruction, adaptations, accommodations, supplementary aids and services, and supports for school personnel. (SWD I C 4)
- Create an instructional plan using assessment information related to individual student achievement. (SWD I C 6)
- Analyze and interpret formative assessment (e.g., curriculum based assessment, CBA). (SWD I C 7)
- Demonstrate an understanding of the purpose and intent of standardized assessments and progress monitoring as one of the multiple indicators of used in overall student evaluation. (SWD I C 8)
- Systematically monitor student performance to best identify areas of need. (SWD I C 9)
- Use evaluative data on an individual, class and district level to implement instructional and/or programmatic revisions for quality improvement. (SWD I C 10)
- Create an optimal learning environment by utilizing, evaluating, modifying and adapting the classroom setting, curricula, teaching strategies, materials, and equipment. (SD I D 3)
- Identify effective co-planning and co-teaching strategies. (SWD I E 1)
- Identify collaborative consultative skills and models (i.e. understanding role on the IEP team; teaming, parallel teaching). (SWD I E 2)
- Identify instructional level of students through collaboration with members of the IEP team. (SWD I E 3)
- Demonstrate an understanding of the meaningful roles parents and students play in the development of the student's education. (SWD I E 5)
- Demonstrate sensitive multicultural and economic perspectives in order to encourage parent participation. (SWD I E 6)
- Demonstrate an understanding of how to support student and family communication and meaningful participation into the student's educational program. (SWD I E 7)
- Work collaboratively with all members of the student's instructional team including parents and agency personnel. (SWD I E 8)
- Demonstrate an ability to match instructional research-validated literacy interventions to identified student needs (SWD II 1)
- Demonstrate a conceptual understanding of the components of reading and describe how these areas pose challenges for students with disabilities:
  - Phonological Awareness & Phonics
  - Fluency

- Vocabulary
- Comprehension
- Language
- Word Study (Phonological Awareness & Phonics) (SWD II 2)

• Demonstrate a conceptual understanding of the components of writing and describe how these areas pose challenges for students with disabilities:
  - text production
  - spelling
  - composition for different types of writing (SWD II 3)
• Clearly articulate and model the use of explicit and systematic instruction in the teaching of literacy (reading and writing) for students with disabilities across all reading levels (SWD II 4)
• Utilize assessment tools with appropriate accommodations in the area of literacy program to identify effectiveness of the standards based curriculum (core literacy program for students with disabilities). (SWD II 5)
• Establish and maintain progress monitoring practices aligned with the identified needs of each student to adjust instruction and provide rigor in the area of literacy for students with disabilities (SWD II 6)
• Identify evidence-based instructional practices to be used with students with disabilities in the area of literacy (SWD II 8)
• Demonstrate instructional strategies to enhance comprehension of material. (SWD II 9)
• Demonstrate an understanding of the evidence-based connection between literacy and behavior. (SWD II 10)
• Demonstrate an understanding of the challenges that students with specific disabilities face in content area literacy (SWD II 11)
• Establish and maintain progress monitoring practices within the content area aligned with the identified needs of each student to adjust instruction and provide rigor in the area of literacy for all students with disabilities. (SWD II 12)
• Clearly articulate and model the use of explicit and systematic instruction in the teaching of content area literacy for all students with disabilities. (SWD II 13)
• Assess the readability of content area reading materials (SWD II14)
• Demonstrate the ability to adapt content area material to the student's instructional level. (SWD II 15)
• Identify effective instructional strategies to address areas of need. (SWD III 1)
• Scaffold instruction to maximize instructional access to all students. (SWD III 2)
• Monitor student progress to provide mediated scaffolding and increase academic rigor when appropriate. (SWD III 3)
• Provide feedback to students at all levels to increase awareness in areas of strength, as well as areas of concern. (SWD III 4)
• Strategically align standard based curriculum with effective instructional practices. (SWD III 5)
• Identify and implement instructional adaptations and evidence based practices (demonstrated to be effective with students with disabilities) to provide curriculum content in a variety of ways without compromising curriculum intent. (SWD III 6)
• Analyze performance of all learners and make appropriate modifications. (SWD III 7)
• Design and implement programs that reflect knowledge, awareness and responsiveness to diverse needs of students with disabilities. (SWD III 9)
• Develop and implement universally designed instruction. (SWD III 10)
• Demonstrate an understanding of the range and the appropriate use of assistive technology (i.e., no tech, low tech, high tech). (SWD III 11)
• Identify the differences between academic language and social language. (ELL I A 3)
• Demonstrate cross-cultural competence in interactions with colleagues, administrators, school and community specialists, students and their families. (ELL I B 5)

• Observe culturally and/or linguistically diverse instructional settings. (ELL I B 6)
• Apply research, concepts and theories of language acquisition to instruction. (ELL II A 1)
• Implement appropriate research-based instructional strategies to make content comprehensible for all ELLs. (ELL II A 2)
• Demonstrate effective instructional planning and assessment integrating the PA Language Proficiency Standards for English Language Learners PreK-12 (ELPS) and PA academic standards. (ELL II A 3)
• Use PA ELPS to design content assessment (ELL II B 1)
• Identify issues related to standards-based formative and summative assessment for all ELLs. (ELL II B 2)
• Use assessment data to differentiate and modify instruction for optimal student learning. (ELL II B 3)
• Demonstrate collaborative, co-teaching models for serving ELLs. (ELL II C 2)
• Define common terms associated with English Language Learners. (ELL II C 3)

http://www.education.pa.gov/Documents/Teachers-Administrators/Certification%20Preparation%20Programs/Framework%20Guidelines%20and%20Rubrics/Accommodations%20and%20Adaptations%20for%20Diverse%20Learners%20-%20Guidelines%20that%20inform%20the%20work%20of%20the%20School%20Counselor.pdf

TEXTBOOKS (required)

Brahier, D. J. (2013). *Teaching Secondary and Middle School Mathematics* (4th Ed.). Boston, MA: Pearson.

National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all*. Reston, VA: NCTM.

OTHER REQUIRED, RECOMMENDED, OR RELEVANT READINGS

Boaler, J. (2002). Learning from teaching: Exploring the relationship between reform curriculum and equity. *Journal for Research in Mathematics Education, 33 (4)*, 239-258.

Carpenter, T. P., Fennema, E., Peterson, P. L., Chiang, C., Loef, M. (1988). *Using knowledge of children's mathematics thinking in classroom teaching: An experimental study*. Paper presented at the American Educational Research Association annual meeting, New Orleans, LA. Retrieved from http://files.eric.ed.gov/fulltext/ED292683.pdf

Darling-Hammond, L. (2010). *The flat world and education: How America's commitment to equity will determine our future.* New York, NY: Teachers College Press.

Dewey, J. (1910). *How we think*. Boston, MA: D. C. Heath.

English, L., & Hatford, G.S. (1995). *Mathematics education: Models and processes* (pp. 97-143). Mahwah, N.J.: Lawrence Erlbaum Associates.

Fennema, E., Carpenter, T. P., Franke, M. L., Levi, L., Jacobs, V. R. & Empson, S. B. (1996). A longitudinal study of learning to use children's thinking in mathematics instruction. *Journal for Research in Mathematics Education, 27* (4) 403- 434.

Fosnot, C.T. (2005). *Constructivism: Theory, perspective, and practice*. New York: Teachers College Press.

Goos, M. (2004). Learning mathematics in a classroom community of inquiry. *Journal for Research in Mathematics Education, 35* (4), 258-291.

Hill, H., Ball, D., & Schilling, S. (2008). Unpacking pedagogical content knowledge: Conceptualizing and measuring teachers' topic-specific knowledge of students. *Journal for Research in Mathematics Education, 39* (4), 372-400.

Kieren, C. (2007). Learning and teaching of algebra at the middle school through college levels: Building meaning for symbols and their manipulation. In F, Lester (Ed.), *Second handbook of research on mathematics teaching and learning* (pp. 707-762). Reston, VA: NCTM.

Klein, D. (2003). A brief history of American k-12 mathematics education. In J. Royer (Ed.), *Mathematical cognition* (pp. 175-226). Charlotte, NC: Information Age. Retrieved from http://books.google.com/books?id=MTzyZEyRcN0C&pg=PA175&source=gbs_toc_r&cad=3#v=onepage&q&f=false

Kloosterman, P. & Stage, K. (1992). Measuring beliefs about mathematical problem solving. *School Science and Mathematics, 92*, (3) 109-115. Retrieved from http://www.cimm.ucr.ac.cr/resoluciondeproblemas/PDFs/Kloosterman,P.%20Stage,F.%20Measuring...pdf

Ladson-Billings, G. (1999). *Developing a "dangerous" pedagogy*. Talk given at the 1999 CGI Institute for Teachers, Madison, WI. Paper retrieved from http://archive.wceruw.org/ccvi/pub/newsletter/v5n2_Fl00.pdf

Lamon, S. (2007). Rational numbers and proportionality: Toward a theoretical framework. In F. Lester (Ed.), *Second handbook of research on mathematics teaching and learning* (pp. 629-668). Reston, VA: NCTM.

Moses, R. P. (2012, November 27). Letter to friends of the Algebra Project. [Online Algebra Project, Inc. website]. Retrieved from http://www.algebra.org/articles/2012_BobMoses-AlgebraProject_letter.pdf

National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform*. Washington, DC: U. S. Department of Education.

National Council of Teachers of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics*. Reston, VA: Author.

National Council of Teachers of Mathematics. (1991). *Professional standards for teaching school mathematics*. Reston, VA: Author.

National Council of Teachers of Mathematics. (1995). *Assessment standards for school mathematics*. Reston, VA: Author.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: NCTM.

National Council of Teachers of Mathematics. (2012). *Curriculum issues in an era of common core state standards for mathematics*. Reston, VA: NCTM.

National Council of Teachers of Mathematics. (2013). *Standards and Positions*. Reston, VA: NCTM. Retrieved from http://www.nctm.org/Standards-and-Positions/Position-Statements/Supporting-the-Common-Core-State-Standards-for-Mathematics/

National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for Mathematics*. Washington, D. C.: Author.

NCTM Research Committee (2005). Equity in school mathematics education: How can research contribute? *Journal for Research in Mathematics Education, 36,* 92-100.

National Research Council. (2001). *Adding it up: Helping children learn mathematics*. Washington, D. C.: National Academy Press.

Piaget, J. (1970). *Genetic Epistemology*. (E. Duckworth, Trans.). New York, NY: Columbia University Press. (Original work published 1950).

Post, T. (1988). Some notes on mathematics learning. In T. Post (Ed.), *Teaching Mathematics in Grades K-8: Research Based Methods* (pp. 1-19). Boston, MA: Allyn & Bacon. Retrieved from http://www.cehd.umn.edu/ci/rationalnumberproject/88_9.html

Schoenfeld, A. (2004). The math wars. *Educational Policy, 18, 253-286.*

Shulman, S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15* (2), 4–21.

Smith, J. P. (1996). Efficacy and teaching mathematics by telling: A challenge for reform. *Journal for Research in Mathematics Education, 27*(4), 387-402.

Smith, M. S., Fuhrman, S. H., & O'Day, J. (1994). National curriculum standards: Are they desirable and feasible? In R. F. Elmore & S. H. Fuhrman (Eds.), *The governance of the curriculum* (pp. 12-29). Alexandria, VA: Association for Supervision and Curriculum Development.

Spiegel, A. (Reporter). (2012, November 12). *Struggle for smarts? How eastern and western cultures tackle*

learning [Transcript of interview with James Stigler]. Retrieved from http://www.npr.org/blogs/health/2012/11/12/164793058/struggle-for-smarts-how-eastern-and-western-cultures-tackle-learning?sc=emaf

Stein, M.K., Enle, R. A., Smith, M. S., & Hughes, E. K. (2012). Orchestrating productive mathematical discussions: Five practices for helping teachers move beyond show and tell. *Mathematical Thinking and Learning, 10* (4), 313- 340.

Stigler, J. W. & Hiebert, J. (1998). Teaching is a cultural activity. *American Educator, 22* (4) 1-10.

Sztajn, P., Confrey, J, Wilson, P.H., & Edgington,C. (2012). Learning trajectory based instruction: Toward a theory of teaching. *Educational Researcher, 41 (5),* 147 – 156.

Tarr, J., Reys, R., Reys, B., & Chavez, O. (2008). The impact of middle-grades mathematics curricula and the classroom learning environment on student achievement. *Journal for Research in Mathematics Education, 39,* 247-280.

Vygotsky, L. S. (1978). *Mind in society*. (M. Cole & S. Scribner, Eds.). Cambridge, MA: Harvard University Press. (Original work published 1930). Retrieved from http://www.cles.mlc.edu.tw/~cerntcu/099-curriculum/Edu_Psy/EP_03_New.pdf

ADDITIONAL RESOURCES

Mathematics Teacher
Mathematics Teaching in the Middle School
Journal for Research in Mathematics Education

National Council of Teachers of Mathematics	http://www.nctm.org/
Pensylvania Department of Education (PDE)	http://www.pde.state.pa.us/pde_internet/site/default.asp
PDE PA Core Standards	http://www.pdesas.org/Standard/PACore
PDE Standards Aligned System	http://www.pdesas.org/

(Standards, Instruction, Curriculum Framework, and Assessment)

ATTENDANCE

Due to the nature of this course, attendance and participation are essential. If you must miss a class, please call the instructor to explain the situation and submit all work due *prior* to the start of class or, in the case of an emergency, *as soon as possible*. If you are absent, you are responsible for obtaining any notes, assignments, readings, etc. given during the class session missed; absence cannot result in missing or late work. Missing more than one class session or a pattern of late arrivals may, at the discretion of the instructor, result in a reduced or failing grade for the course. Please see the *Secondary Field Experience Handbook*, available on the Moravian College Education Department's website for field experience attendance guidelines.

ACADEMIC HONESTY

All work you submit must be your own. Be certain to cite the sources you use and take great care to avoid plagiarism, which the Moravian College Student Handbook defines as "the use, deliberate or not, of any outside source without proper acknowledgement" (52). Academic dishonesty as described in the scholastic integrity policy of Moravian College will result in a grade of zero and the Academic Dean will be notified.

EVALUATION

Assignments are expected on the due date as indicated in the course schedule or as communicated in class. Without a mutually agreed upon revised due date, any late assignment will lose 5% points for each day it is late. Any assignments more than two weeks late will receive no credit. Students who wish to request accommodations in this class for a disability should contact Laurie Roth, Assistant Director of Learning and Services for Academic and Disability Support in Monocacy Hall, by calling 610-861-1401. Accommodations cannot be provided until authorization is received from the Academic Support Center.

GRADED ASSIGNMENTS
Use APA (6th Ed.) format and style for formal assignments and papers.

1. Reflective Responses: Connecting Theory and Practice	(10%)
2. IEP/Section 504 Learner Case Study & Lesson Plan	(10%)
3. English Language Learner (ELL) Case Study & Lesson Plan	(10%)
4. Mathematical Engagement & Achievement for All Learners Unit Plan	(20%)
5. Mathematical Engagement & Achievement for All Learners Unit Plan Reflective Critique	(20%)
6. Final Exam: Philosophy of Mathematics Education Statement and Practice Interview	(20%)
7. Field Journal	(5%)
8. Class Participation and Preparation	(5%)

* Please note that assignment due dates are subject to modification as the instructor deems necessary.

1. Reflective Response: Connecting Theory and Practice (10%)
- Share your reflective responses to weekly prompts with learning community members via Google Drive.
- Connect prompt to readings, pre-student teaching field placement, learning community discourse, and your own learning experiences.
- Discuss specifically how theoretical and practical strategies promote mathematical success for all learners, including students with disabilities in an inclusive setting and ELLs.
- Due: must be submitted by noon the following Monday (see course schedule)

2. IEP/Section 504 Learner Case Study & Lesson Plan (10%)
- Identify a student in your field placement with a documented disability.
- Using the student's initials, describe the disability and develop an overall action plan and specific lesson plan.
- Case Study & Lesson Plan (includes teaching the lesson)
- Draft Due: 10/7; Final Due: 10/14

3. English Language Learner (ELL) Case Study & Lesson Plan (10%)
- Identify an English Language Learner in your field experience placement.
- Using the student's initials, describe the student's proficiency level and develop an overall action plan and specific lesson plan.
- Case Study & Lesson Plan (includes teaching the lesson)
- Draft Due: 10/14; Final Due: 10/21

4. Mathematical Success for All Learners Unit Plan (20%)
- Design a unit consisting of at least 10 lessons, at least 5 of which you will teach to students in the field.
- Use PA Core mathematics standards and guidance from your Cooperating Teacher to determine what you want students to learn; describe specific learning theories and teaching strategies that meet the diverse needs of all students, include the curriculum and resources you will use, and describe the various types of assessment you will use to guide your planning and instruction before, during, and after each lesson.
- First Draft Due: 10/21; Polished Draft Due: 10/28; Final Draft Due: 10/30

5. Mathematical Success for All Learners Unit Plan Reflective Critique (20%)
- A reflective critique is an honest analysis of your instructional plan in relation to what actually occurred in your classroom.
- Write a critique of the lesson and unit that answers several reflective questions about instructional planning, curriculum, teaching, learning, and assessment.

• Final Draft Due: 12/9

6. Final Exam: Practice Interview **(20%)**

- Share your philosophy of mathematics education by creating one component of a professional digital portfolio (your Philosophy of Mathematics Education: Mathematical Success for All statement) and participating in a mock interview.
- Answer authentic interview questions as a practical application of all you will have learned (via readings, dialogues, and experiences working with educators and students in the field) in this course.
- Interview on 12/16

7. Field Journal **(5%)**

- You will be required to keep a Field Journal. Reflection, when done regularly and honestly, can be a major contributor toward teaching excellence. It is something that should be done deliberately and in a way that works well for you as an individual.
- Entries can take many forms: paragraph, observation notes, bullet points, diagrams, etc. Include a dated entry for each day of your field experience.
- You are expected to have your field journal with you each day in the field as well as in class.
- Completed 9/28 - 12/11

8. Class Preparation and Participation **(5%)**

In this course, you are expected to be prepared for learning community dialogues and develop your skills as a reflective teacher. The following two assignments will help you meet both expectations:

1. Discussion Questions.

   Most weeks, you will construct responses to specific questions from the textbook that will require you think deeply about the material so that you are able to fully participate in class. These are for your benefit and can take many forms: paragraph response, detailed bulleted list, outline form, etc. Whether typed or hand-written, bring your responses to class each week.

2. Article Annotations

   For assigned journal articles, construct a brief (1 page) annotation that 1) briefly summarizes the article 2) connects the article to other readings, your field experience, or your own educational experiences, and 3) describes how the information may benefit your teaching. These annotations will not only help you better understand and connect to the material in the course, they will serve as a resource throughout your student teaching experience and during your professional career. Annotations should follow APA format guidelines, using the reference as a heading. Bring your annotations to class each week.

COURSE SCHEDULE

(Note: This part of the syllabus is subject to modification, as the instructor deems necessary, to ensure course objectives and needs of the learning community are met.)

WEEK 1: 2-SEP-2015

Topics	Assignments
Attend Field Experience Meeting 6:30 PM, PPHAC 102 **Welcome and Introduction** Attend Field Experience Seminar Building a Learning Community of Inquiry Mathematical Autobiographies Qualities of a Good Mathematics Teacher Beliefs about Mathematics, Learning Mathematics, and Teaching Mathematics Course Information: purpose/outline/assignments/expectations/texts	**Read** 1. textbook chapters 1 and 2 2. *PtA* pp. 1-5 3. article: Smith (1996) **Prepare** 1. Discussion Questions (p. 26) #1, 7, 9, & 10 and (p. 41) #3 and 7 2. article annotation **Respond** Reflective Response Prompt #1: Describe your experiences as a learner of mathematics. Include your stories of great (and not-so great teachers), classroom learning environments, specific content and/or classes, technology, successes and struggles, etc.

WEEK 2: 9-SEP-2015

Topics	Assignments
Chapter 1: Mathematics as a Process The Current Mathematics Education Climate National and International Assessment Data The Need for Reform Doing Math: Problem Solving, Reasoning and Proof, Communication, Connections, and Representation Standards for Mathematical Practice (CCSSM) **Chapter 2: Principles of Mathematics Education** elements necessary to create an exemplary mathematics middle/high school program 1. Equity 2. Curriculum 3. Teaching 4. Learning 5. Assessment 6. Technology NCTM's Guiding Principles for School Mathematics Acronyms: NCTM, PCTM, PDE, SAS, CCSSM, ...	**Read** 1. textbook chapter 3 2. *PtA* pp. 7-29 3. article: Post (1988) **Prepare** 1. Discussion Questions (p. 73) # 2, 4, & 7 2. article annotation 3. Watch: The Case of Mr. Donnelly and the Candy Jar Task **OR** The Case of Ms. Culver and the Pay it Forward Task www.NCTM.org/ptatoolkit/ **Respond** Reflective Response Prompt #2: How do the teachers and experiences you described in the first prompt compare with the current model of mathematics education? (Use Smith, Post, CCSSM, NCTM, and Brahier to guide your thinking.)

WEEK 3: 16-SEP-2015

Topics	Assignments
Chapter 3: Learning Theories and Psychology in Mathematics Education Current Research in Mathematics Education Learning Theories in Mathematics Education Development of Learning Theory Bruner's Stages of Representation The van Hiele Model The Inquiry Approach and Constructivist Model Inductive vs. Deductive Teaching Traditional vs. Constructivist Classrooms Teacher Knowledge Teacher Beliefs and the CCSSM (Smith, 2015) *http://www.npr.org/sections/codeswitch/2013/08/02/206813091/to-60s-civil-rights-hero-math-is-kids-formula-for-success	**Read** 1. textbook chapter 12 2. *PtA* pp. 59-69 3. article: Boaler (2011) 4. article: Ladson-Billings (1999) **Prepare** 1. Discussion Questions (p. 368) #2, 4, 7, & 10 2. article annotations 3. listen to Bob Moses interview* **Respond** Reflective Response Prompt #3: How do learning theories discussed relate to your classroom experiences? What beliefs about mathematics, learning, and teaching did these environments reflect? Connect these learning theories to specific teacher practices. Explain how your knowledge, beliefs, and experiences influence your teaching practice.

WEEK 4: 23-SEP-2015

Topics	Assignments
Chapter 12: Meeting the Needs of All Students Defining and Achieving Educational Equity Students with Special Needs Gender Ethnic and Cultural Issues English Language Learners Ideas for Meeting for Diverse Learner Needs Differentiated Instruction General Suggestions for the Classroom Mathematical Success for All: Access, Equity, Inclusion Algebra as a Civil Right Teaching "Dangerously"	**Read** 1. textbook chapters 4 and 5 2. NCTM (2012) pp. 73-79, 84-85 *CIECCSSM* 3. *PtA* p. 70-77 4. article: Shulman (1986) **Prepare** 1. Discussion Questions (p. 102) # 3 & 10 and (p. 132) # 3 & 4 2. article annotations **Respond** Reflective Response Prompt #4: How will you teach "dangerously" to promote equity and ensure mathematical success for all students? Use specific learning theories and teaching strategies you'll use to engage reluctant learners, students with disabilities, and ELL students. How will you handle push-back you might encounter from administrators, colleagues, students, and families?

FIELD EXPERIENCE BEGINS MONDAY, SEPTEMBER 28, 2015!!!

WEEK 5: 30-SEP-2015

Topics	Assignments
Chapter 4: Curricular Models Essential Math Knowledge Mathematics Standards NCTM Curriculum Standards, Focal Points CCSSM Traditional vs. Integrated Sequences (Pathways) PA Core Curriculum **Chapter 5: Implementing a Course of Study** Writing Goals and Objectives Selection and Organization of Resources Reflecting on a Lesson *http://info.nwea.org/FY2012WinterCampaignKLTWebinar2On-demandRegistration.html?	**Read** 1. textbook chapters 10 and 11 2. *PtA* pp. 89-98 3. Chappuis (2009) pp. 1-14 **Prepare** 1. Discussion Questions (p. 312) #1 & 2 and (p. 340 #4, 8, & 10) 2. article annotation 3. watch Dylan Wiliam's Formative Assessment webinar* 4. IEP/Section 504 Learner Case Study & Lesson Plan - first draft 5. discuss Unit Plan w/ Cooperating Teacher **Respond** Reflective Response Prompt #5: As a middle or high school mathematics teacher, how will you plan and enact your curriculum vision to ensure that *all* your students meet the PA core standards? What will you need to investigate? Discuss the importance of curricular knowledge (Shulman, 1986). To focus your response, you use specific PA mathematics standards from the grade level (7-12) of your choice.

WEEK 6: 7-Oct-2015

Topics	Assignments
Chapter 10: The Role of Assessment What is Assessment? Purposes of Assessment Types of Assessment Test Construction Alternative Assessments **Chapter 11: Principles of Assessment Practices** NCTM Recommendations of Assessment PDE Recommendations on Assessment and Assessment Anchors Equity and Assessment Homework Assignments Evaluation: Making and Determining Final Grades IEP/Section 504 Learner Case Study & Lesson Plan Workshop	**Read** 1. textbook chapter 6 2. article: McTighe & Sief (2003) **Prepare** 1. Discussion Questions (p. 166) #4 & 10 2. article annotation 3. IEP/Section 504 Learner Case Study & Lesson Plan - final draft 4. ELL Case Study & Lesson Plan - first draft 5. bring Unit Plan ideas to class **Respond** Reflective Response Prompt #6: Clearly describe the types and purposes of assessments used by your Cooperating Teacher. How do the students respond to different types of assessments? How do assessment choices impact learning?

WEEK 7: 14-Oct-2015

Topics	Assignments
Chapter 6: Planning for Instruction Unit Planning vs. Lesson Planning Understanding by Design (Wiggins & McTighe, 2005) Lessons are Polished Stones IEP/Section 504 Learner Case Study & Lesson Plan Teaching and Community Feedback ELL Learner Case Study & Lesson Plan Workshop *http://www.npr.org/sections/health-shots/2012/11/12/164793058/struggle-for-smarts-how-eastern-and-western-cultures-tackle-learning	**Read** 1. textbook chapter 7 2. *PtA* pp. 29-57, 78-88 3. article: Stein et al. (2008) **Prepare** 1. Discussion Questions (p. 205) #1 & 3 2. article annotation 3. listen to James Stigler interview* 4. ELL Case Study & Lesson Plan - final draft 6. Unit Plan - first draft **Respond** Reflective Response Prompt #7: Describe how your plan is Unit Plan is designed for understanding and ensures meaningful learning experiences for *all* your students, including those with disabilities or ELL students? Throught each lesson and the unit, how will you know if learning is occurring?

WEEK 8: 21-Oct-2015

Topics	Assignments
Chapter 7: Teaching Tools and Strategies Teaching Standards and Guiding Principles Selecting Activities and Problems Manipulative, Models, and More The Learning Environment Classroom Discourse: Teacher Role, The Art of Questioning, and Voice Reflective Practices Productive Struggle: Cultural Beliefs about Teaching and Learning ELL Learner Case Study & Lesson Plan Teaching and Community Feedback Unit Plan Workshop	**Read** 1. textbook chapter 8 2. article: *Teaching Number Sense* **Prepare** 1. Discussion Questions (p. 234-235) #1 & 10 2. article annotation 3. ELL Case Study & Lesson Plan - final draft 3. Unit Plan - polished draft **Respond** Reflective Response Prompt #8: "Polish" the lessons in your Unit Plan and choose one for this response. In what way(s) did you improve it? How does your polished lesson reflect effective teaching tools and strategies? Specifically describe your role in asking questions to elicit student thinking, orchestrating productive discussions, using mathematical models, and allowing students to struggle.

WEEK 9: 28-OCT-2015

Topics	Assignments
Chapter 8: Teaching Number Sense and Algebra Reasoning and Sense Making The Teaching of Number Sense The Teaching of Algebra Guest Teacher: Catherine Meholic Unit Plan Community Feedback **HAPPY HALLOWEEN!!!**	**Read** 1. textbook chapter 9 pp. 236-248 2. article: *A Study of Note Taking and Its Impact on Student Perception of Use in a Geometry Classroom* **Prepare** 1. Discussion Questions (p. 275) #1 & 3 2. article annotation 3. Unit Plan - final draft (submit via email by noon Friday, 10/30) **Respond** Reflective Response Prompt #9: How have the teaching and learning of algebra changed since you were a student? What are some of the tools and techniques for teaching algebra that you found most interesting or effective? Think back to Bob Moses: do you think the current model of teaching and learning algebra helps all students develop algebraic literacy?

WEEK 10: 4-NOV-2015

Topics	Assignments
Chapter 9: Teaching Geometry, Statistics/Probability, and Discrete Mathematics The Teaching of Geometry The Teaching of Statistics and Probability The Teaching of Discrete Mathematics Pre-Calculus and Calculus Guest Teacher: Kevin Hartshorn Unit Plan: Formative Assessment and Reflection	**Read** 1. textbook chapter 9 pp. 248-276 2. article: *CIiaEoCCSSM* (2012) 3. article: *CIiaEoCCSSM* (2012) **Prepare/Play** 1. Discussion Questions (p. 276) #6 & 7 2. article annotations 3. play with Geometers Sketchpad and Geogebra 4. implement Unit Plan **Respond** Reflective Response Prompt #10: Choose a geometric concept of your interest. How would go about teaching this concept in a hands-on minds-on way that engages all learners? Would you choose a high-tech, low-tech, or no tech approach? How does the approach you choose fit the concept and the learners?

WEEK 11: 11-NOV-2015

Topics	Assignments
Chapter 9: Teaching Geometry, Statistics/Probability, and Discrete Mathematics The Teaching of Geometry The Teaching of Statistics and Probability The Teaching of Discrete Mathematics Pre-Calculus and Calculus Unit Plan: Formative Assessment and Reflection	**Read** 1. article: Lamon (2007) 2. article: Lanius & Williams (2003) **Prepare** 1. article annotations 2. implement Unit Plan **Respond** Reflective Response Prompt #11: At this point, what has been the biggest surprise in implementing your Unit Plan? How have your best laid plans worked well? In what ways are you and/or your students struggling? How do you know? How are you modifying your specific lesson plans and Unit Plan to ensure mathematical success for all your students?

WEEK 12: 18-NOV-2015

Topics	Assignments
Proportional Reasoning Proportionality: A Unifying Theme for the Middle Grades Integers Models and a Modeling Perspective Unit Plan: Formative Assessment and Reflection	**Read** 1. textbook chapter 13 2. *PtA* pp. 99-117 3. article: *Parents are Not the Enemy* **Prepare** 1. Discussion Questions (p. 392-393) #1 & 5 2. article annotation 3. Unit Plan implementation 4. Unit Plan Reflective Critique - first draft **Respond** Reflective Response Prompt #12 What do you believe about mathematics, learning mathematics, and teaching mathematics? What are the foundations for these beliefs? Have your beliefs changed since August 31st? Describe the key knowledge and practical experience(s) that have contributed to your learning of how to be an exemplary mathematics teacher.

HAPPY THANKSGVING!!!

WEEK 13: 2-DEC-2015

Topics	Assignments
Chapter 13: The Teacher of Mathematics in the School Community Working with Parents The Supervision and Evaluation of Teachers Functioning in a Department Ongoing Professional Development The Role of the Mathematics Teacher Reading and Writing in Mathematics importance of and techniques for incorporating reading and writing in mathematics	**Read** 1. a mathematics education article of your choice from a professional journal **Prepare** 1. article annotation - be ready to share! 2. Unit Plan Reflective Critique - final draft 3. Create an E-Portfolio entry to reflect who you are as a teacher. Include: a) brief (1-2 page) Philosophy of Mathematics Education statement b) Unit Plan & Reflective Critique c) photos from your field expereince d) samples of student work (no names) e) other evidence gathered this semester that supports your philosophy statement **Respond** PERSONAL RESPONSE - DO NOT POST! Authentic reflection is an integral part of your growth as a teaching professional. As you prepare for student teaching, consider, what things do you naturally well in the classroom? What effective teaching practices have you worked hard to develop this semester? What aspects of your teaching still need improvement and what actions will you take during student teaching to improve?

WEEK 14: 9-DEC-2015

Topics	Assignments
Professional Journal - Reading Presentations Course Reflection and Celebration Guest Speaker: Tom Evans	**Prepare** 1. Unit Plan Reflective Critique (due noon Monday, 2/9) 2. create E-Portfolio entries and Practice Interview responses

FIELD EXPERIENCE ENDS FRIDAY, DECEMBER 11, 2015

WEEK 15: 16-DEC-2015

Topics	Assignments
Practice Interviews in lieu of final exam authentic experience (questions from local principles) dress professionally bring e-portfolio and field journal	**Prepare** Get ready for Student Teaching!!!