

MORAVIAN COLLEGE
BETHLEHEM, PENNSYLVANIA
EDUCATION 362Z
CURRICULUM AND INSTRUCTION IN MATHEMATICS
FALL 2012

INSTRUCTOR: Susanna M. Freed
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CLASS HOURS: Wednesday 6:30 – 9:30 PM in PPHAC room 112
OFFICE HOUR: Wednesday 9:30 – 10:30 PM in PPHAC room 112

BIG IDEAS:

- What does it mean to do, teach, and learn mathematics in the 21st century?
- How do we create/structure mathematics classrooms for the success of every student?
- How do national trends influence the local curriculum?
- Are teachers limited to the textbook as a resource for teaching?
- How does assessment become more than just testing?
- Does being a teacher involve more than imparting content knowledge?

OBJECTIVES:

Class Participation & Presentations

- To practice and develop teaching skills in mathematics in a non-threatening environment
- To develop skills in teaching secondary mathematics that will promote genuine learning to **all** student populations
- To prepare for and share thoughts from the field experience
- To examine current best practices in mathematics, teaching students with disabilities, and teaching English Language Learners
- To examine, discuss and apply NCTM Principles and Standards, Common Core, and Pennsylvania State Standards and Assessment Anchors
- To examine and be able to use the PA SAS website in conjunction with planning
- To examine, discuss, question and practice *The Understanding by Design* model
- To begin preparing a portfolio and practice the interview process
- 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)
- 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
- Define common terms associated with English Language Learners.
- Identify issues related to standards-based formative and summative assessment for all ELLs.

Unit Plan/Lesson Plan Creation, Implementation, & Reflection

- To use *The Understanding by Design* model to create a unit plan
- To plan, construct, differentiate and execute mathematics unit plans, lesson plans and assessments effectively
- Demonstrate effective instructional planning and assessment integrating the PA Language Proficiency Standards for English Language Learners PreK-12 (ELPS)
- Use PA ELPS to design content assessment.
- Use assessment data to differentiate and modify instruction for optimal student learning.
- 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.
- 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.
- Recognize areas of development for students with disabilities and plan effectively for: interpersonal processes, forming and maintaining relationships (including parent-child, caregiving, peer, friend, sibling), and attachment models and their effects on learning.
- Apply principles in social competence, social withdrawal, social role formation and maintenance, and prosocial behaviors, and aggression as they affect learning.
- 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.
- 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.
- Demonstrate an understanding of the meaningful roles that parents and students play in the development of the student's education program.
- Demonstrate sensitivity multicultural and economic perspectives in order to encourage parent participation.
- Demonstrate an understanding of how to support student and family communication and meaningful participation into the student's educational program.
- Demonstrate an ability to match instructional research-validated literacy interventions to identified student needs.
- 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.
- Utilize assessment tools with appropriate accommodations in the area of literacy to identify effectiveness of the standards based curriculum (core literacy program for students with disabilities).
- Identify evidence-based instructional practices to be used with students with disabilities in the area of literacy.
- Demonstrate instructional strategies to enhance comprehension of material.
- Demonstrate an understanding of the challenges that students with specific disabilities face in content area literacy.
- 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.
- Clearly articulate and model the use of explicit and systematic instruction in the teaching of content area literacy for all students with disabilities.
- Demonstrate the ability to adapt content area material to the student's instructional level.
- Identify effective instructional strategies to address areas of need.
- Scaffold instruction to maximize instructional access to all students.
- Strategically align standard based curriculum with effective instructional practices.

- Identify and implement instructional adaptations based on evidence-based practices (demonstrated to be effective with students with disabilities) to provide curriculum content using a variety of methods without compromising curriculum intent.
- Design and implement programs that reflect knowledge, awareness and responsiveness to diverse needs of students with disabilities.
- Use research supported methods for academic and non-academic instruction for students with disabilities.
- Develop and implement universally designed instruction.
- Demonstrate an understanding of the range and the appropriate use of assistive technology (i.e., no tech, low tech, high tech).

Field Experience & Reflection

- Demonstrate cross-cultural competence in interactions with colleagues, administrators, school and community specialists, students and their families.
- Observe culturally and/or linguistically diverse instructional settings.
- Apply research, concepts and theories of language acquisition to instruction.
- Implement appropriate research-based instructional strategies to make content comprehensible for all ELLs.
- Demonstrate collaborative, co-teaching models for serving ELLs.
- Initiate, maintain and manage positive social relationships with a range of people in a range of contexts.
- 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. Apply principles in social competence, social withdrawal, social role formation and maintenance, and prosocial behaviors, and aggression as they affect learning.
- Identify effective co-planning and co-teaching strategies.
- Identify collaborative consultative skills and models (i.e., understanding role on the IEP team; teaming; parallel teaching).
- Identify instructional level of students through collaboration with members of the IEP team.
- Work collaboratively with all members of the student's instructional team including parents and non-educational agency personnel.
- Monitor student progress to provide mediated scaffolding and increase academic rigor when appropriate.
- Provide feedback to students at all levels to increase awareness in areas of strength, as well as areas of concern.
- Analyze performance of all learners and make appropriate modifications.
- 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 students with disabilities.
- 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, and standard scores.
- Create an instructional plan using assessment information related to individual student achievement.
- Analyze and interpret formative assessment (e.g., curriculum based assessment, CBA).
- Demonstrate an understanding of the purpose and intent of standardized assessments and progress monitoring as one of multiple indicators used in overall student evaluation.
- Systematically monitor student performance to best identify areas of need.
- Use evaluative data on an individual, class and district level to implement instructional and/or programmatic revisions for quality improvement.
- Create an optimal learning environment by utilizing, evaluating, modifying and adapting the classroom setting, curricula, teaching strategies, materials, and equipment.
- Understand the role of the general educator as part of the team for transition planning across transition points (i.e., preschool to school entry, grade level to grade level, school to school, to post school outcomes).

COURSE REQUIREMENTS

- All written work outside of class must be typed. Formal papers must be double spaced and written in APA style.
- All assignments must be completed on time.
- Attendance at all class sessions. (If you have an emergency, notify the instructor as soon as possible.)

EVALUATION

- 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.
- Work is expected on the due date. Please notify teacher **prior to** the due date if an emergency arises.
- Evaluation is based on the following:

20%	Unit Plan
15%	Written Responses to Questions/Reflective Topics
15%	Portfolio & Mock Job Interview (in lieu of Final Exam)
10%	Reflective Critique of Unit Plan
10%	In-class Mini Lessons (Including Reflection)
10%	Field Experience Lesson Observations
10%	In-class Presentations/Participation
10%	Reflective Field Journal

WEEKLY SCHEDULE OF TOPICS

(This part of the syllabus is subject to slight modifications.)

August 29, 2012

Class Discussion Topics

- Get acquainted-information exchange
- Mathematical Autobiography/Qualities of a Good Mathematics Teacher
- Course Outline/Assignments/Grading & Attendance Policy
- Mathematics Reform
- Doing Math: Problem Solving/Reasoning?Communications/Connections/Representation
- The Standards for Mathematical Practice

Assignment:

-Read the articles: *A Vision for Mathematics, Marvelous Math, Correcting the Course of Math Education, and What is High-Quality Instruction?*

-Reference the notes/discussion/website insidemathematics.org from class and the articles you read to respond in writing to the following:

1. What similarities/themes did you see presented in the first four (4) articles above. Be specific.
2. If you are told to have “Reason abstractly and quantitatively” as the focal point of your mathematics classroom, describe how you would accomplish that through your lesson design.
3. How does this compare to the way you have learned mathematics? Give specific examples.

-Research your individually assigned test, either the *TIMMS* or the NAEP, and prepare a presentation with your classmate(s) about your particular test and the results.

September 5, 2012

Class Discussion Topics

- Current Research in Mathematics Education
- Brain Research in mathematics
- Brunner's Stages of Representation, Van Hiele Model, Gardner's Seven Styles of Learning
- Traditional vs. Constructivist Classroom
- Mathematics and Learning Support Students and English Language Learners

Assignment:

-Read the articles: *A Model for Understanding Understanding in Mathematics*, *Using Thought Bubble Pictures to Assess Students' Feelings about Mathematics*, *Addressing the Equity Principle in the Mathematics Classroom*, *Bridging the Language Barrier in Mathematics*

-The end of the article *Addressing the Equity Principle in the Mathematics Classroom* related some ongoing questions about mathematics education to consider. Answer these questions based on the class notes, discussion, and assignment readings. Be sure to include specific ways you can accommodate the various stages of language acquisition and common accommodations for students with disabilities.

-Create a SAS account. You will go to the SAS website: <http://www.pdesas.org/> and create an account by setting it up in New User. You will find this on the right hand side of the home page near the bottom.

September 12, 2012

Class Discussion Topics

- NCTM and PCTM: Your professional organizations
- "Focal Points" for K – 8 and "Focus" for High School
- PDE Website and SAS
- Common Core, State Standards, Anchors, PSSA, and Keystones

Assignment:

- Read Sections 1 & 3 from *Focus in High School Mathematics*
- Read your assigned chapter from Section 2 in *Focus in High School Mathematics*
- Prepare a short presentation to the class in which you discuss the key elements in your assigned chapter, an example or two and how your chapter ties in with Section 1.
- Answer the following: How do Sections 1 & 3 of *Focus* tie in/support the articles from last week on equity and inclusion of ELL students and students with disabilities in mathematics?
- Explore the SAS web. Write down a couple of things you found interesting, odd, of use, and/or puzzling.
- How does it support your efforts to design lessons that are inclusive of ELL students and/or students w/disabilities

September 19, 2012

Class Discussion Topics

- Essential Math Knowledge
- Traditional vs. Integrated Sequences
- Compare/Contrast Textbooks
- Formative Assessments

Assignment:

-Read *Teaching Number Sense, Math Acceleration for All, Why Mathematics Textbooks Matter*

1. Does the article you read on Math Acceleration for all solve the equity issue or are the concepts talked about here totally unrelated? Support your stance.
2. Does the article on number sense make any sense? Support your answer.

Monday, September 24, 2012 is the start of your field experience. You will be required to keep a Journal for this experience.

Reflection is one of the biggest components of the teaching experience. When done regularly and honestly, it can be a major contributor towards teaching excellence. It is something that should be done deliberately and in a form that works well for you as an individual. For this reason, your Reflective Journal for EDU 362Z can take many forms. It may be typed or handwritten. It can be done in paragraph form or bullet points. You don't always have to use the same format as long as you keep all your entries together by date.

I will read your Reflective Journals regularly, but unlike other assignments, I will not write on them unless you ask me a specific question that you want answered in the context of the journal. Your grade for them will consist of either you have done it or you haven't and you will either receive full credit or no credit for the assessment. *The only exception to this is if I ask you to write on a specific topic and you have neglected to do that, you will receive no credit.*

Your Reflective Journal entries need to be dated and given a heading of some description. For example if you present a Warm-Up activity on September 5, you would write (type) the following: September 5, 2012, Polygon Warm-Up. This set up is easiest for me to read and assess. When you do it in your own classroom, you will set up your own method. I type directly on my lesson plan with comments, suggestions, changes needed, etc.

Your Reflective Journal for this course is a written reflection of your experiences while in your Field Experience. For this reason, you will not start it until September 24 and it will end December 4. I will collect/read it periodically (**it should always be with you**) during the course, but you will submit the journal in its entirety on December 5. Additionally, there will be times in class, that we will share verbally some of the topics.

Your Reflective Journal will include, but is not limited to the following items:

- Lesson Reflections of all lesson taught (both partial and whole) in the field experience
- General comments, thoughts, questions, surprises raised during your field experience
- A reflection on your visit to a learning support class **and** an ELL class (This will include questions asked of the teacher before and after the experience, your insights, recognition of techniques used in the context of the class, and what you learned that you can carry into your own classroom.)
- A reflection of how your cooperating teacher incorporates techniques and accommodations for both IEP **and** ELL students
- A reflection of classroom management techniques your cooperating teacher uses.
- A reflection of questioning techniques used by your cooperating teacher
- A reflection of the various formative and summative assessments used by your cooperating teacher including accommodations made for IEP **and** ELL students
- A reflection of resources, in addition to the textbook, used by your cooperating teacher
- A reflection of how literacy strategies are used by your cooperating teacher

You need at least 2 reflections each week.

September 26, 2012

Class Discussion Topics

- Writing Goals and Objectives (Content and Language)
- Selection and Organization of Resources
- Reflecting on a Lesson
- BDA model

Assignment:

-Develop a lesson plan to teach addition and subtraction of fractions in a middle school classroom. Assume the students have already learned to simplify, multiply, and divide fractions. The lesson needs to be well grounded in the five process skills associated with doing mathematics (problem solving, reasoning and proof, communication, connections, and representation) utilizing the BDA template. Additionally, the lesson needs to be developed with ELL and students with learning disabilities in mind. It should be completed in the following manner.

- a. Follow the procedure outlined in your green handbook
- b. It should be appropriate for the time period in which your field assignment period is following (please indicate length of period)
- c. Write both cognitive and language objectives for your lesson.

Included, but separate from the actual lesson plan:

- a. Identify which parts align with which process skills
- b. Explain how special needs students and ELL students in your classroom are having their needs met by the lesson.
- c. Explain which Learning Theory it is modeled after and why it fits that theory.

October 3, 2012

Class Discussion Topics

- Lesson Planning vs. Unit Planning
- Understanding by Design
- Creating a “Learning Environment”
- Reading Apprenticeship / Penn Literacy Network (4 Dimensions of Learning)

Assignment:

-Read *A Deeper Look at Lesson Study, Making Worksheets More Effective, A study of Note Taking and Its Impact on Student Perception of Use in a Geometry Classroom*

1. After reading the article on “Lesson Study”, research the subject and write a description of what it is, pros and cons of implementing it, and some general personal reactions to the process.
2. Fill in the ARTICLE ANALYSIS for *Making Worksheets More Effective* and be ready to discuss this next week.
3. In the article on note taking in geometry, discuss your thoughts on the three methods described-pros and cons, and your thoughts in general on possible implementation in your classroom. Can this be expanded to other subjects in mathematics? How?

-Begin to put your Unit Plan together

October 10, 2012

Class Discussion Topics

- Questioning Strategies
- Mathematical Thinking using Questions
- High-Level Task

Assignment:

-Modify the given lesson to incorporate the questioning strategies and create a bank of Colin's Type 1 and 2 questions for this lesson.

October 17, 2012 (*Field Trip to Nazareth Area Middle School*)

Class Discussion Topics

- Data Dens
- Computer Technology and Software
- Smart Board
- Internet and WWW
- Smart Response System

Assignment:

-Take the Lesson Plan given to you in class and discuss the weaknesses and strengths of the lesson in relation to its implementation of ELL students. Redesign the weak areas of the lesson so that it better accommodates ELL and students with disabilities.

October 24, 2012

Class Discussion Topics

- Introduction to your portfolio
- 8 Mathematical Practices
- What is assessment?

Assignment:

-Create a formative assessment for each example assigned in class. Be sure to include accommodations and strategies that will benefit students with disabilities and ELL students.

October 31, 2012

Class Discussion Topics

- Equity in Assessment

Assignment:

-Read *Creating Optimal Opportunities to learn Mathematic: Blending Co-Teaching Structures with Research-Based Practices, Creating a Differentiated Mathematics Classroom*

-Take the assessments given to you in class and discuss the strengths and weaknesses of them in terms of overall best practices. Redesign them to address these weaknesses.

November 7, 2012

Class Discussion Topics

- Defining and Achieving Equity
- Meeting Diverse Student Needs
- Mainstreaming and Inclusion
- The Co-Teaching Model

Assignment:

-Read *Mathematical Literacy, Teaching Students to Interact with Text, Apprenticing Adolescents to Reading in Subject-Area Classrooms*

-Redesign the assessment given in class for your specific ELL student profile and WIDA result

November 14, 2012

Class Discussion Topics

- Working with Parents
- Reading and Writing practices in the mathematics classroom

Assignment: Unit Plan Due on Tuesday, November 20

November 20, 2012: Unit Plan due to me in Ed Office by 3:00 PM

November 28, 2012

Class Discussion Topics

- Supervision and Evaluation of Teachers
- Functioning in a Department
- Ongoing Professional Development

Assignment: Unit Plan Reflective Critique
Completed Reflective Journal will be collected on December 5

December 5, 2012

Class Discussion Topics

- Presentation of Unit Plans
- Final questions on Portfolios and Interview
- Any unfinished topics

Assignment: -Complete Portfolio and Prepare for Interview based on Employment Ad given in class

December 7, 2012: Field Experience ends

December 12, 2012: Bring completed Portfolio for Formal Interview (Dress appropriately)

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UNIT PLAN REQUIREMENTS

Your Unit Plan is 20% of your grade and the Reflective Critique of your Unit Plan is worth 15% of your grade. The plan needs to be developed early in your field experience. Since the plan represents your ideas about teaching and learning as they impact a particular group of students, you should consult with an expert on those students (and that age group in general). The expert, I speak of would be your cooperating teacher. With his/her help, you need to designate a unit and a group of students you will be teaching.

Your unit must be a minimum of ten lessons. You must teach a minimum of half of these lessons. Due to content, your plan may be longer than this and you may certainly teach as many lessons as you and your cooperating teacher decide are appropriate. I would certainly encourage you to teach as much as possible as this will better prepare you for your student teaching experience.

The unit is an opportunity for you to put into practice methods and theories you are learning in this course and previous courses. Activities you design should be differentiated to support a variety of appropriate levels. You need to identify the ELL levels of your activities. The activities should actively engage learners. The lessons should reflect appropriate NCTM and Pennsylvania state standards.

Your Unit Plan should include:

1. Table of Contents
2. A Description of the School you are teaching in: Give a broad sense of the student body and the community from which the school draws. Tie in the relevance that this has with your teaching. In discussing the broader community, be sure to talk about cultural and specifically, linguistic diversity within the community the school serves.
3. A Description of the Students you are Teaching: Your discussion needs to capture a sense of the students as a class. More importantly, you need to include a discussion of the diverse nature of your students. Discuss the linguistic diversity and discuss the cultural diversity. State how many students have I.E.P.'s and the nature of the variety of needs the special needs learners will bring to class. For the class as a whole and for individuals, talk about how they seem to learn. Explain how this knowledge will impact your planning. In the spirit of universal design, you need to plan in a way that takes all of your students into consideration. In preparing to write this section, make sure that you have seen and analyzed all IEP's, WIDA results, any standardized tests you are able to view, any screening tests or any diagnostic tests. Also, talk to your cooperating teacher, the learning support teach, the ELL teacher, or others who might be able to inform our knowledge of the students. You should also use your own observations of the students in this section.
4. The Unit Plan Planning Template filled in appropriately for your Unit.
5. Individual Lesson Plans (as outlined above) that follow the format set up in your green handbook.
6. All handouts (i.e. activity sheets, student worksheets, etc.)
7. All assessments (summative and formative)
8. Annotated listing of resources used including websites, books, people, teacher workbooks
 - Note: Compile a list of resources that are relevant to your unit. These would include ones that you use and ones that you don't use. The annotation is a sentence or two about how you used the item or might use the item for a unit.

Please place the plan in a three-ring binder.

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UNIT PLAN REFLECTIVE CRITIQUE REQUIREMENTS

What is a reflective critique?

A reflective critique is like a peer microteaching analysis in that you examine your plan in relation to what actually happened in your classroom. In around seven pages, write a critique that answers the following questions (not necessarily in the order presented below):

- What view of teaching and learning in general and teaching and learning mathematics in particular guided your unit?
- What do the unit plan and your implementation of the unit plan reveal about your style of teaching?
- Describe the students you taught and how they responded to your unit.
- Critique the implementation of the unit. Use both feedback from others and evidence from the classroom itself (student work, data you gather after lessons, recollections after each lesson) to critique the implementation of the unit. Some questions you might ask yourself as you do this are
 - What changes did you need to make as you implemented your best-laid plans?
 - Which lesson was the strongest of the unit? Why?
 - Which was your least effective lesson? Why?
- What are the strengths and the weaknesses of the unit you designed?
- How would you re-design this plan were you to teach it again?
- What did you learn about how students learn and the best way to teach?
- What are your areas of strength as a teacher and what are some area you want to focus on improving?

Evidence

- A variety of student work including written work, projects, quizzes
- Cooperating Teacher notes
- Moravian Supervisor notes
- Peer Notes (if possible)
- Your own reflective notes on lessons which you should write after each lesson you teach