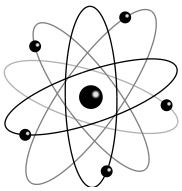
Education 364Z: Curriculum and Instruction In Science
Moravian College
Fall, 2011



Instructor: Steven Weiss **Cell:** 610-751-7985

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(Select High School Option)

Office Hours: By appointment; before or after class

Course Meeting Time: Thursdays – 6-9pm in PPHAC 235

Course Objectives: Each student will …

- Synthesize a personal rationale and philosophy for teaching science.
- Infuse inquiry and constructivist practices in their teaching.
- Demonstrate mastery and application of the Pennsylvania Department of Education Academic Standards for Science & Technology and Environment & Ecology,
  to prepare students for upcoming state assessments.
- Become familiar with National Science Standards, PA Standard Aligned System and Common Core Standards.
- Make instructional modifications for students with learning disabilities and English language learners in planning and practice. (Unit plan and all lesson plans)
- Create an instructional environment that promotes success for diverse learners.
- Practice the activities of teaching: unit design, lesson planning, instruction, questioning, evaluating texts, assessing student learning, and reflection.
- Utilize, practice, and demonstrate varied, effective, teaching methods in both the college classroom and field experience settings.
- Reflect on one's effectiveness and success after delivering a lesson.

- Incorporate technology into planning and in classroom instruction.
- Observe and evaluate actual classroom practices and interact professionally with secondary students and fellow educators.
- Analyze and become familiar with resources (professional organizations and professional journals) for secondary science teachers.
- Demonstrate the essentials of laboratory safety and classroom management.
- Discuss and analyze current trends in science education.
- Research and employ science area-specific pedagogy.
- Prepare for the interview process.
- Prepare for student teaching and the professional of science education.

Required Texts:

Designing Effective Instruction: What Works In Science Classrooms by Anne Tweed

Science as Inquiry in the Secondary Setting by Julie Luft. Randy L Bell, & Julie Gess-Newsome

Investigating Safely: A Guide for High School Teachers by Juliana Texley, Terry Kwan, and John Summers

* Other readings will be required from other sources.

Web Sites:

National Science Teachers Association: www.nsta.org

National Association of Biology Teachers: www.nabt.org

American Association of Physics Teachers: www.aapt.org

American Chemical Society: www.acs.org

Journal of Chemical Education: http://jchemed.chem.wisc.edu/

Pennsylvania Science Teachers Association: www.pascience.org

PA Department of Education: www.pde.state.pa.us (PA Standards)

PA Standard Aligned Systems: http://www.pdesas.org/ (SAS)

Benchmarks for Scientific Literacy/Project 2061: www.project2061.org

National Science Education Standards:

http://search.nap.edu/readingroom/books/intronses/

Journal of Research in Science Education:

http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291098-2736

National Association of Special Education Teachers: http://www.naset.org/

National Association for Bilingual Education: http://www.nabe.org/

Journal of Teacher Education: http://jte.sagepub.com/

American Educational Research Journal: http://www.aera.net/

Attendance: The success of this class relies heavily on the full participation of all its members. A large part of this class depends greatly on your class discussions and presentations. Of course, illness and emergencies arise and are unavoidable. If you cannot attend class for a valid reason, please call me. You are responsible for finding out what you missed from the other class members. It is your responsibility to consult the course schedule for the due dates of assignments. Since class participation is dependent on your attendance, your grade may be affected by absences. More than two absences

may jeopardize the passing of the course. The instructor reserves the right to determine the conditions upon which late work may be submitted and graded.

Academic Honesty Policy: Please refer to the Student Handbook for this college policy.

Grading: Your final grade is calculated as follows:

- Lessons & Assignments: 35%
- Unit Plan: 25%
- Field Experience & Field Journal: 25%
- Participation, Portfolio, Miscellaneous Assessments: 15%

* Please note: It is within the instructor's purview to apply qualitative judgment in determining grades for an assignment or for a course *

Students with Disabilities: If you need accommodations in this class, please contact the Learning Services Office as soon as possible to enhance the likelihood that such accommodations are implemented in a timely fashion.

Work Requirement: Students should expect to work 3 or more hours per week outside of class and field experience.

Disclaimer: This syllabus is subject to change

LESSONS

- 1 Micro-Lesson: Present a lesson that takes about twenty minutes. Lesson plan follows Moravian College format; turn in before you deliver the lesson. Self-critique due by the next class.

- 1 Laboratory-Driven Lesson: 40 minutes long. Lesson plan follows Moravian College format; turn in before you deliver the lesson. Self-critique due by the next class.

- 1 Classroom Activity-Driven Lesson: 40 minutes long. Lesson plan follows Moravian College format; turn in before you deliver the lesson. Self-critique due by the next class.

- 1 Internet-Assisted Lesson: 40 minutes long. Lesson plan follows Moravian College format; turn in before you deliver the lesson. Self-critique due by the next class.

- 1 Current Event-Driven Lesson: 40 minutes long. Lesson plan follows Moravian College format; turn in before you deliver the lesson. Self-critique due by the next class.

- 1 Videotaped Lesson From Field Experience: 30 minutes long. The class will view it. Self-critique due by the next class.

** The class will decide whether peer critiques will be shared after a lesson.

ASSIGNMENTS

- **Textbook/Reading Activities**: Simple, reflective tasks from our required books which are discussed in groups and by the entire class when we meet.

- **Personal Mission Statement & Philosophy:** In a previous course, you may have written a general philosophy statement on teaching. For this activity, you will concentrate specifically on science teaching and your specific discipline. Kids, invariably will ask you "Why is this stuff important?" Well, you will need to answer their question quickly and convincingly! So, prepare yourself now! Address questions like: What is your personal definition of science? Why do you want to teach science? Why is it important? Why is your discipline important? What are your goals in science teaching? Why do kids need to be scientifically literate? What will kids get out of your class? How will kids master the PA Standards? How will you help LD and ELL students in your classroom? One page will be sufficed.

- **5 Journal Article Critiques**: After reading an article, write a brief summary and reaction in which you address the following:

    - Why did you choose this article?
    - Why was the article written? For whom?
    - What information was valuable to you?
    - What will the students learn? (If applicable)
    - Why is this article important?
    - Are the strategies appropriate and effective?
    - What would you change? (If applicable)

**Attach a copy of the article to the critique and be prepared to discuss it with the class that evening.

The five critiques will be from the following:

- *The Science Teacher* – Classroom Activity
- *The Science Teacher* – Science Pedagogy
- *The Science Teacher* – Teaching science to students with special needs. (Learning disabled or ELL kids)
- Content specific journal – Science Pedagogy
- Educational Journal – Any

- 1 Cookbook Conversion Lab Activity: Find a "cookbook" lab exercise and (as Emeril would say) "Kick it up a notch." Transform this mundane lab into an exercise that models the constructivist model of learning. Or, some call it a discovery lab. Change those lame, low level questions to those that require kids to think at a higher level. "Bam," now you've got a great lab!

- 3 Web Site Reviews: Zip around the web looking for websites for teachers or students. Pick three that knock your socks off and write a brief two paragraph review of them. If applicable, indicate if the site may help students master one or more PA Standards. **Attach your review to a printout of the website's "home" page (screen).** Be prepared to discuss at class.

- Textbook Review: Use the rubric provided and conclude with a 2-4-paragraph report written to a school district book selection committee describing the strengths and weaknesses of this text. Support your position. Make sure to address whether the PA Standards are covered in the textbook.

UNIT PLAN

- Your ten-day unit plan should include the following:
    - Name of the Unit
    - Title of Course
    - Description of Students
    - Unit Rationale
    - Objectives
    - Content Outline
    - Correlation to PA Standards/Anchors
    - Materials Required
    - Specific Modifications and Teaching Strategies for LD and ELL students
    - Methods of Formative Assessments Methods (Learning Strategies)
    - Daily Lesson Plans- must follow Moravian College format.
    - Unit Exam

Field Experience Journal

- **1-2 Weekly Entries: These are numberd and e-mailed to me weekly during your field experience at weisss@nwlehighsd.org. SUBJECT: EDUC 364Z JOURNAL**

    - I'm interested in your observations and reflective thoughts throughout your nine weeks. Remember, you are not critiquing your coop. Nor am I asking for a narrative on the week's activities. (Unless they were significant to you.) Below are some observations that I would like you to address? It not an inclusive list.

        - How does the teacher teach the class? Is there a certain daily structure?
        - What unique strategies do you see?
        - Can you make any connections to prior (or current) education courses.
        - Does the instructor use technology? How?
        - How are the textbooks utilized?
        - How is the class managed – procedures and discipline?
        - How does the teacher plan for the year? Unit? Semester?
        - How are Standards addressed?
        - How does the class prepare students for state assessments?
        - Closely observe students in the classroom.
        - Reflect on your lessons. **You must teach at least ten**.
        - Observe other science teachers (with their approval.)
        - Describe the classroom of students. Talk to your coop about the diverse nature of the their class. Ask about cultural diversity. Ask about linguistic diversity and students with special needs.
        - Discuss how students with special needs are accommodated in the classroom.
        - Observe (discreetly) a Special Needs Student: Observe and share your reflections throughout the field experience. Meet and interview the student's Special Education or ESL teacher/case manager. Read, review, and reflect on the students IEP (particularly accommodations and/or language goals) and reflect on how it is used in the classroom. Please remember that an IEP is a confidential document!

- Feel free to pick a student that interests you and observe them throughout your experience.

*** Some of your narratives may begin to sound like case studies. In fact, you will pick one <u>significant</u> event and write a case study. (See below)**

- **<u>Case Study:</u>** Write a case study using your journal. You will be making copies for class members. We will be discussing them on a class night.Following are some questions to help guide you through commenting on significant classroom events:

  <u>Case Study Prompts</u>:

  - ✓ What is the context of the event?
  - ✓ What actions were taken first?
  - ✓ Who took the action?
  - ✓ Why was it taken?
  - ✓ What is the class atmosphere like?
  - ✓ How did the action make you feel?
  - ✓ What question(s) have arisen?
  - ✓ What would <u>you</u> do? Why?

  ***Please <u>be discreet and use pseudonyms.</u>**

- **<u>Journal Conclusion</u>**

  - Finally, conclude with a 2-3-paragraph description of what you learned about teaching and students from your experience.

<u>PORTFOLIO</u>

A good portfolio shows personal achievement and growth. Ideally, your portfolio should begin with your first field experience through your student teaching. This project is for you! When you want to land a job, you must sell yourself! Show and be proud of your hard work done at Moravian! Share it with those who are interviewing you for a position! Why not give them a videotape of your teaching talents! With this in mind, make this project your own creation. This should be a loose-leaf binder, which contains materials assigned throughout this semester (and from other courses, if you wish) that reflect your knowledge base, teaching skills & experience, personal philosophies, accomplishments, and reflections. Examples of student work are also encouraged. If you want to include any activities from the textbook, simply Xerox the page(s). Include any other additional items you think would indicate your competence as a teacher. After student teaching, you can add and modify your portfolio to reflect your new achievements. Then, carry this baby with you as you hunt for a job!

Education 364Z: Curriculum and Instruction In Science Calendar

Please note: topics may change with advanced notice.

* We will make a concerted effort to discuss readings each class. Please be ready to converse about the topics covered in the text.

8/31 – Course Overview & Introduction

- ✓ **Meeting at 6:30 w/ Mrs. Modjadidi and Dr. Mayer in 202**
- ✓ **Class Overview**

9/8 - Science Teaching Introduction Pt 1

- ✓ **Why Teach?**
- ✓ **Our Philosophy and Goals**
- ✓ **The 5-E Model**

9/15 Science Teaching Introduction Pt 2 & A Little History

DESI: Chapters 3 and 4

Due:

- ✓ **Personal Mission Statement & Philosophy**
- ✓ **Lesson: Classroom Activity Driven with MoCo Lesson Plan**
- ✓ **Critique of lesson emailed by Sunday.**

9/22 - Goals & Objectives

DESI: Chapter 1 and 2

Due:

- ✓ **Lesson: Current Event Driven (MoCo Lesson Plan)**
- ✓ **Critique of lesson emailed by Sunday**

9/27 – FIELD EXPERIENCE BEGINS!

9/29- Curricula – Meeting in Computer Lab -TBA

SAI: Chapters 1 and 2

Due:

- ✓ **Lesson: Internet Assisted Driven (MoCo Lesson Plan)**
- ✓ **Critique of lesson emailed by Sunday**

10/6 - Inquiry & Questioning

SAI: Chapters 6 and 8

Due:

- ✓ **Lesson: Laboratory Driven (MoCo Lesson Plan)**
- ✓ **Critique of lesson emailed by Sunday**
- ✓ **Field Journal Entry emailed by Sunday**

10/13 - Safety & Management

No Readings This Week!

Due:

- ✓ **3 Web Site Reviews –be ready to discuss.**
- ✓ **Field Journal Entry emailed by Sunday**

10/20 - Planning

No Readings This Week!

Due:

- ✓ **Unit Plan**
- ✓ **Field Journal Entry emailed by Sunday**

10/27 - The Kids We Teach

SAE: Chapters 9 and 11

|Due:

- ✓ **3 Journal Critiques – be ready to discuss.**
- ✓ **Field Journal Entry emailed by Sunday**

11/3 - Strategies and Rationale

Reading: TBA

Due:

- ✓ **2 Journal Critiques – be ready to discuss.**
- ✓ **Cookbook Conversion Lab**
- ✓ **Field Journal Entry emailed by Sunday**

11/10 - Professional Development I

Readings: TBA

Due:

- ✓ **Case Study and Discussion**
- ✓ **Field Journal Entry emailed by Sunday**

11/17 - Assessment

Readings: TBA

Due:

- ✓ **Textbook Review**
- ✓ **Field Journal Entry emailed by Sunday**

11/24 NO CLASS: Happy Thanksgiving!

12/1- Our Special Needs Students: Guest speaker tonight!

Readings: TBA

Due:

- ✓ **Field Journal Entry emailed by Sunday**

12/8 - Professional Development II and Closure

Readings: TBA

Due:

- ✓ **Videotaped lessons from field experience (MoCo Lesson Plan)**
- ✓ **Portfolio**

Have a wonderful winter break! Happy Holidays!

PENNSYLVANIA D.O.E. ELL STANDARDS

- Demonstrate cross-cultural competence in interactions with colleagues, administrators, school and community specialists, students and their families. (FE)

- Observe culturally and/or linguistically diverse instructional settings. (FE)
  Apply research, concepts and theories of language acquisition to instruction. (FE)

- Implement appropriate research-based instructional strategies to make content comprehensible for all ELLs. (FE)

- Demonstrate effective instructional planning and assessment integrating the PA Language Proficiency Standards for English Language Learners PreK-12 (ELPS) (UP, LP)

- Use PA ELPS to design content assessment. (UP, LP)

- Identify issues related to standards-based formative and summative assessment for all ELLs. (Class discussion)

- Use assessment data to differentiate and modify instruction for optimal student learning. (UPC/LP)

- Demonstrate collaborative, co-teaching models for serving ELLs. (FE)

- Define common terms associated with English Language Learners. (Class)

PENNSYLVANIA D.O.E. SPECIAL EDUCATION STANDARDS

- 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. (FE, UP, LP)

- Physical: 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. (LP, UP)

- Social: Initiate, maintain and manage positive social relationships with a range of people in a range of contexts. (FE)

    - Recognize areas of development for students with disabilities and plan effectively for: interpersonal processes, forming and maintaining relationships (including parent-child, care giving, peer, friend, sibling), and attachment models and their effects on learning. (FE, LP,UP, UPC)
    - Apply principles in social competence, social withdrawal, social role formation and maintenance, and pro-social behaviors, and aggression as they affect learning.

- Behavioral – 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 pro-social behaviors, and aggression as they affect learning. (FE)

- 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.(LP, UP, UPC)

- 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. (FE, UPC)

- 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.

- Create an instructional plan using assessment information related to individual student achievement. (LP, UP, UPC)

- 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. (FE, UPC, UP)

- Systematically monitor student performance to best identify areas of need. (FE, LP, UPC)

- Use evaluative data on an individual, class and district level to implement instructional and/or programmatic revisions for quality improvement. (ID)

- Create an optimal learning environment by utilizing, evaluating, modifying and adapting the classroom setting, curricula, teaching strategies, materials, and equipment. (FE, LP, UPC)

- Identify effective co-planning and co-teaching strategies. (FE, UP, UPC)

- Identify collaborative consultative skills and models (i.e., understanding role on the IEP team; teaming; parallel teaching). (FE, UP, UPC)

- Identify instructional level of students through collaboration with members of the IEP team. (FE, UP, UPC)
- 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). (UPC)

- Demonstrate an understanding of the meaningful roles that parents and students play in the development of the student's education program. (UPC)

- Demonstrate sensitivity multicultural and economic perspectives in order to encourage parent participation. (UPC)

- Demonstrate an understanding of how to support student and family communication and meaningful participation into the student's educational program. (UPC)

- Work collaboratively with all members of the student's instructional team including parents and non-educational agency personnel. (FE, UPC)

- Demonstrate an ability to match instructional research-validated literacy interventions to identified student needs. (LP, UP, UPC)

- 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 (EDUC 244)

- 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. (LP, UP, UPC)

- 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). (FE, UP, UPC, LP)

- 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. (LP, UPC)

- Identify evidence-based instructional practices to be used with students with disabilities in the area of literacy. (LP, UP, UPC)

- Demonstrate instructional strategies to enhance comprehension of material. (LP, UPC)

- Demonstrate an understanding of the challenges that students with specific disabilities face in content area literacy. (UP, UPC)

- 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. (LP, UPC)

- 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.

- 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.

- 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.

- Analyze performance of all learners and make appropriate modifications.

- 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).