

EDUC 535: Science for Teachers, Fall 2015

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Tuesdays 4:45-6:45. **Note: There are no classes Sept. 15th or Sept. 22nd.

There is a class Friday, Oct. 2nd, 4:45-6:45.

Classroom: 408/409

First class is Tuesday, Sept. 8th . Last class is Tuesday, December 15th.

C o u r s e O u t l i n e

I. Objectives

- A. Increase basic science understandings through active investigations with common phenomena and everyday materials.
- B. Increase the integration of science investigations with other curricular areas, and over a range of age groups and diverse learners.
- C. Increase teachers' resources that support diverse ways of science learning for a range of cultural and economic student populations.

II. Requirements

- A. Class Participation: Each person is expected to actively participate

in class investigations and discussions. Much of each session cannot be done in a "make up" situation. More than one absence may result in a lower final grade, an Incomplete, or a No Credit.

B. Required Readings, Writings and the Alternative Assignment

****Homework Journals**. You are required to write and submit a journal of each class session. Each journal is to be one to two pages in length (typed, double spaced), and is a written reflection on what has happened to you during the session that caused you to rethink or reconsider what you have been doing as a teacher or as a learner. Journals are to be emailed on or before each one is due.

****Reading Response Papers**. There are five (5) Reading Response Papers. Each Response Paper will be two to four pages, double spaced. Here is the requirement for each paper:

- Choose one major idea in the reading that is of meaning to you as a teacher and learner. Write a brief summary of this one major idea. This should be no more than a half page. Title this half page: "Summary".
- Write why this major idea has meaning to you, and how this idea influences your thinking and practice as a teacher and learner.

My comments to both your Homework Journals (HJ) and your Reading Response Papers will be by email. Email your papers as a .doc attachment. Do not send as a google doc.

C. The following are the five (5) required readings. Write a Reading Response (described above) for each of these readings.

--“But, Is it Science?” Lillian Weber, 1972. City College Workshop Center. (This reading will be electronically sent to you).

--Developing Science in the Primary School. Wynne Harlen. Heinemann Educational Books, Inc.: New Hampshire. 1989. (This reading will be electronically sent to you)

--“The Right Question at the Right Time”. Jos Elstgeest. Primary Science: Taking the Plunge. (This reading will be electronically sent to you)

--Respecting Children’s Own Ideas. Wynne Harlen, the 2000 Catherine Molony Memorial Lecture, CCNY. Copies of this reading will be sold for \$2 in class. A copy is also available in the library’s Reserve File for this course. Ask for EDUC 535/Chu.

--Assessment in the Inquiry Classroom. Wynn Harlen. Foundations, vol. 2, Chapter 11. (This reading will be electronically sent to you).

I will periodically email you suggested readings.
Any suggested readings need no written responses.

D. Due Dates of Written Assignments

--September 29:

Homework Journal about the September 8 class.

Reading Response Paper for Weber's, "But, is it Science?"

--October 6:

Reading Response Paper for "Developing Science in the Primary School".

--October 13:

Homework Journals about three (3) class sessions: 9/29, 10/2, and 10/6.

--October 20:

Reading Response Paper for "The Right Question at the Right Time".

--October 27:

Homework Journals about two (2) classes: 10/13 and 10/20.

--November 10:

Reading Response for "Respecting Children's Own Ideas"

--November 17:

Homework Journals about three (3) classes: 10/27, 11/3, 11/10

--November 24:

Reading Response Paper for "Assessment in the Inquiry Classroom".
Wynne Harlen. Foundations, vol. 2, Chapter 11.

--December 1:

Homework Journals about two (2) classes: 11/17 and 11/24.

--December 8:

Final Project Paper

****Please Note:**

All written assignments must be submitted December 8, 2015.

You will receive either an Incomplete or a No Credit if all written work is not received by December 8, 2015. Note that in order to be considered for an Incomplete, you must have already submitted the majority of written assignments on or before December 8, 2015.

There is a required alternative assignment for one (1) missed class session.

You may receive a No Credit if you miss more than one class session.

E. Final Project Paper-Investigative Study

The final project paper is a curriculum that brings together what you have gained from your own active investigations with materials in sessions, class discussions, and your related readings. This is a description of an investigative study that you might do with children in the future, or that you have already done with them. Your curriculum for this study must reflect the doing of science through direct, first hand experiences by children.

Use the following headings to write this paper:

1. Focus. One paragraph describing the science understandings you want the children to learn.
2. Context. One paragraph describing the age or grade of children, school setting, and your reasons for choosing this investigative study.

3. The Investigation:

If you are writing an investigation for **early childhood**, describe a study that continues for two (2) weeks. For example, you might describe an investigation by children at a water table that remains available in the room for two weeks. Your writing describes how you would gradually complicate the investigative work done by children. Do not write separate lessons.

If you are writing an investigation for children **first grade or older who will have set science periods** (for example, science twice a week for 50 minutes each), describe a study that lasts four (4) science lessons. Describe each session as: Lesson #1, Lesson #2, etc. Your Focus and Context are only stated once, not for each lesson.

4. Resources. List and describe four (4) resources for either teachers or children that support your Final Project Paper. Write two (2) to three (3) sentences that describe each of your four resources.

This Final Project Paper is due no later than December 8, 2015.

Developing Lessons Reflectively (Written and contributed by M. Martinez-Deluca)
Please use this as a general guide. You are not expected to address each item.

The essential components of lesson planning:

1. PRE-FORMAL PLANNING

- ✓ What is my focus and context?
- ✓ What standards are present in my lessons?
- ✓ What will I be teaching?
 - Identifying the content: curriculum and standards
 - Identifying the concepts
 - Identifying the skills

- Identifying specific vocabulary
 - How will inquiry be fostered?
- ✓ What are the essential questions and understandings (BIG IDEAS) that will guide the lessons?
 - ✓ What should my students understand, know, be able to do?
 - ✓ Who are the children that I am planning for?
 - ✓ Who will need challenges? What kind? Who will need modifications? What kind? What questions will develop higher order thinking?
 - ✓ Who are the students who meet the expectations? What will they need to foster and develop _____
 - ✓ Who are my outliers and what will they need to engage them?
 - ✓ What do I expect my students to do and/or explain .
 - ✓ Am I aware of the common misconceptions?

2. MATERIALS

- ✓ What will I use throughout the lesson?
- ✓ What could I use in place of something I don't have?
- ✓ Do I have to modify to provide support or challenge?
- ✓ How many of _____ will I need?
- ✓ Will technology support the learning? How?
- ✓ What resources will support the lesson?

3. THE LESSON

- ✓ What stage is this lesson? B.D. M How will the stage affect the lesson?
- ✓ What teaching strategies will be used in the lesson:
 - ? Direct instruction/simulation/hands-on
 - ? Whole-group/small group/partner work
 - ? Differentiated instructional strategies
 - ? Questions that will lead to inquiry
- ✓ What will the students do? How will this take place?
- ✓ What learning activities will take place? What tools are necessary?
- ✓ Where/when will the students' comments/questions/conjectures and reflections take place?
- ✓ How is formative assessment reflected in the lessons? How will you know what the students understand? (prior to lesson/during lesson/end of lesson)
- ✓ Will the students have opportunity to lead?
- ✓ How will the science notebook be used?
- ✓ Is a summative assessment necessary?
- ✓ What follow-up work is necessary?

Consider set up/clean up/ role of students/your role

4. CLOSURE

- ✓ What will the end of the lesson look like? What is appropriate?

Student discussion/summation/questions?

Student generalizations?

Student presentation?

Exit Tickets relating what they noticed? observed? uncovered? Learned?

What will the H.W. look like?

--Write your email address on the top of the first page of your Final paper. In the Subject line of your email, write “Final Paper/(your last name)”.

--You must email me your final paper. If so, I must receive it via email on or before December 8, 2015.

--I will email you my comments and final grade.

III. Assessment: your final course grade consists of two marks weighted equally:

1. Class participation/homework journals, reading critic papers.
2. Final Project Paper — Investigative Study

IV. Graduate Students with disabilities:

Students with Disabilities: If you are a student with a disability and you need disability-related classroom accommodations, please make an appointment as soon as possible. Bank Street College complies with the ADA and has an Office for Students with Disabilities (O SD). If you are not registered with the Office for Students with Disabilities, please stop by Room 605 to register for support services, or call: Val Burr, Coordinator of O SD, at [\(212\) 875-4791](tel:2128754791) or email her at vburr@bankstreet.edu to make an appointment.

If you have any specific learning needs that you want to discuss, contact me immediately at either (212) 875-4499 or schu@bankstreet.edu

The College respects individuals' religious observances. If you are unable to make any class session including the Oct. 2 (Friday) session because of religious observance, please notify the course instructor by the first class session so that an alternative means can be identified for fulfilling missed class material and course assignments.

****Cell phones, etc.:** Either turn off or set to vibrate during class. If you must make or receive a call or text, please do so in the hallway.

ACEI and NAEYC Standards for EDUC535

ACEI

1.0 Development, Learning and Motivation: Candidates know, understand and use the major concepts, principles, theories, and research related to development of children and young adolescents to construct learning opportunities that support individual students' development, acquisition of knowledge and motivation.

2.2 Science: Candidates know, understand and use fundamental concepts of physical, life and earth/space sciences. Candidates can design and implement age-appropriate inquiry lessons to teach science, to build student understanding for personal and social applications and to convey the nature of science.

3.1 Integrating and applying knowledge for instruction: Candidates plan and implement instruction based on knowledge of students, learning theory, connections across the curriculum, curricular goals and community.

3.2 Adaptation to diverse students: Candidates understand how elementary students differ in their development and approaches to learning, and create instructional opportunities that are adapted to diverse students.

3.3 Development of critical thinking and problem solving: Candidates understand and use a variety of teaching strategies that encourage elementary students' development of critical thinking and problem solving.

3.4 Active Engagement in Learning: Candidates use their knowledge and understanding of individual and group motivation and behavior among students at the K-6 level to foster active engagement in learning, self motivation, and positive social interactions and to create supportive learning environments.

3.5 Communication to foster collaboration:

Candidates use their knowledge and understanding of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the elementary classroom.

4.0 Assessment for Instruction: Candidates know, understand and use formal and informal assessment strategies to plan, evaluate and strengthen instruction that will promote continuous intellectual, social, emotional and physical development of each elementary student.

NAEYC

Standard 1: Promoting Child Development and Learning

Candidates prepared in early childhood degree programs are grounded in a child development knowledge base. They use their understanding of young children's characteristics and needs, and of multiple interacting influences on children's development & learning, to create environments that are healthy, respectful, supportive, and challenging for each child.

1a. Knowing & understanding young children's characteristics & needs, from birth thru age 8.

1b. Knowing & understanding the multiple influences on early development & learning.

1c. Using developmental knowledge to create healthy, respectful, supportive, and challenging learning environments for young children.

Standard 3: Observing, Documenting and Assessing to Support Young Children and Families

Candidates prepared in early childhood degree programs understand that child observation, documentation, and other forms of assessment are central to the practice of all early childhood professionals. They know about and understand the goals, benefits, and uses of assessment. They know about and use systematic observations, documentation, and other effective assessment strategies in a responsible way, in partnership with families and other professionals, to positively influence the development of every child.

3a. Understanding the goals, benefits, and uses of assessment – including its use in development of appropriate goals, curriculum, and teaching strategies for young children

3b. Knowing about and using observation, documentation, and other appropriate assessment tools and approaches, including the use of technology in documentation, assessment and data collection.

3c. Understanding and practicing responsible assessment to promote positive outcomes for each child, including the use of assistive technology for children with disabilities.

Standard 4: Using Developmentally Effective Approaches

Candidates prepared in early childhood degree programs understand that teaching and learning with young children is a complex enterprise, and its details vary depending on children's ages, characteristics, and the settings within which teaching and learning occur. They understand and use positive relationships and supportive interactions as the foundation for their work with young children and families. Candidates know, understand, and use a wide array of developmentally appropriate approaches, instructional strategies, and tools to connect with children and families and positively influence each child's development and learning.

4a. Understanding positive relationships and supportive interactions as the foundation of their work with young children

4b. Knowing and understanding effective strategies and tools for early education, including appropriate uses of technology

4c. Using a broad repertoire of developmentally appropriate teaching /learning approaches

4d. Reflecting on own practice to promote positive outcomes for each child

Standard 5: Standard 5: Using Content Knowledge to Build Meaningful Curriculum

Candidates prepared in early childhood degree programs use their knowledge of academic disciplines to design, implement, and evaluate experiences that promote positive development and learning for each and every young child. Candidates understand the importance of developmental domains and academic (or content) disciplines in early childhood curriculum. They know the essential concepts, inquiry tools, and structure of content areas, including academic subjects, and can identify resources to deepen their understanding. Candidates use their own knowledge and other resources to design, implement, and evaluate meaningful, challenging curriculum that promotes comprehensive developmental and learning outcomes for every young child.

5a. Understanding content knowledge and resources in academic disciplines: language and literacy; the arts – music, creative movement, dance, drama, visual arts; mathematics; science, physical activity, physical education, health and safety; and social studies.

5b. Knowing and using the central concepts, inquiry tools, and structures of content areas or academic disciplines

5c. Using own knowledge, appropriate early learning standards, and other resources to design, implement, and evaluate developmentally meaningful and challenging curriculum for each child.