

Fall 2015

EDCI 3150

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EDCI 3150

Methods and Materials in Elementary Science Teaching/Field Methods Fall 2015

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Office: 342H

Textbook: Buxton and Provenzo (2011) *Teaching Science in Elementary and Middle School*. Los Angeles: Sage Publications. ISBN: 978-1-4129-7991-7 (pbk)

Or an older edition:

Buxton and Provenzo (2007) *Teaching Science in Elementary and Middle School*. Los Angeles: Sage Publications. ISBN: 978-1-4129-2497-9 (pbk)

Optional:

Bass, JE, Contant, T and Carin AA (2009) Activities for Teaching Science as Inquiry, 7ed. New York: Allyn and Bacon. ISBN 978-0-13-615680-2

Other materials to be assigned.

Online Resource: www.sagepub.com/buxtonstudy

Unit Standards: <http://coehd.uno.edu/cf.cfm>

State Standards: <http://www.doe.state.la.us/lde/pd/1009.html>

National Standards: www.nap.edu/openbook.php?record_id=4962

NSTA Standards: <http://www.nsta.org/pdfs/NSTASTandards2003.pdf>

Course Description:

We will approach the teaching of science from these standpoints:

1. the nature of science
2. the history and philosophy of science teaching
3. teaching and learning the different disciplines of science: Earth/Space science, Biology, Chemistry and Physics

In this course we will work together to understand the methods and materials appropriate for the teaching of elementary school science in the state of Louisiana (K-6). The philosophy of this course is that people of all ages and learning styles learn best in an environment where they explore topics and come to their own understanding. This environment includes working cooperatively with others from diverse backgrounds in heterogeneous settings and is consistent with the College of Education and Human Development's mission to prepare professionals who practice in culturally diverse settings.

Goals:

- Demonstrate strategies for teaching and acquisition of concepts and computational skills
- Develop and teach reform-based lessons to children based on the Louisiana Components of Effective Teaching
- Identify and explore strategies adaptable for different populations of students
- Engage students in hands-on, inquiry-based lessons
- Access and use national and state standards for elementary science teaching
- Understand key components of science from Biology, Earth Science, Chemistry and Physics, and be able to integrate these components with math and the humanities.
- Understand Field-Based science teaching and learning

Required Activities

The list of required activities for this class will include, but not be limited to:

- Lesson Plans for the semester, year, quarter
- Preparation of Classes dealing with specific science topics utilizing hands-on exploration
- Classes integrating mathematics and science and data collection
- Classes that take place out of the classroom
- Learning to use scientific and educational technology
- Observation and reflection on teaching in the classroom
- Designing a science experiment
- Learning and teaching accurate science content (Earth Science, Biology, Chemistry and Physics) consistent with a literate college student

This class will also require 15-20 hours of field experience which may include actual classroom teaching, preparation and reflection at an off-campus site.

This class will require at least one field trip that takes place off campus outside of class time.

You are required to check your UNO email and Moodle at least once a day.

Preparation and Participation

You are college students, graduate students and developing professionals. My expectation is that you will strive to make this course valuable for yourself and for your classmates. Therefore, my expectation is that you will come to class prepared and on time, communicate with me in advance if you will miss class, and participate actively in class discussions and activities.

Class Attendance

Attendance in class is mandatory. Copying notes does not duplicate discussions and the sharing of ideas. There will be point deductions for lateness

and missing classes. Please call a classmate for missed information. After three absences, please drop the course.

Some of the activities and lessons for this course will take place out of doors (in the field). Therefore some rearrangement of class times will be necessary to allow appropriate time in daylight hours. This may involve weekend or early afternoon meetings. Attendance at all class-time field trips is mandatory; a minimum of one out-of-class field trip is mandatory. Others can be used for attendance make-up and extra credit.

Grading

You are expected to attend all class meetings (see UNO attendance policy: (<http://www.uno.edu/>) and submit all required course assignments on the designated due date in a professional and appropriate manner to demonstrate competency of the course objectives. Correct spelling and grammar are criteria that will be evaluated, so please proofread your work before submission. Assignments are to be completed *prior* to coming to class so that thoughtful and informed discussions can take place.

Late assignments are penalized 10% of their “graded value” for each day they are late (including weekends, holidays). You are expected to turn in your own work for credit, and while collaboration with others is encouraged, any indication that you are handing in any part of someone else’s work will be considered cheating and will be handled through university disciplinary channels (see UNO academic honesty policy (<http://www.uno.edu/>). This includes, but is not limited to, wholesale copying of webpages or printed materials that are represented as your own work.

Please note that a grade on a project is neither a judgment of you as a person nor of the amount of effort you spent, but rather of the quality of your work. In addition, this course and its activities will abide by all other stated UNO regulations, including, but not limited to, the policy on sexual harassment (see UNO website: <http://www.uno.edu/>)

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|-----------------------------------|-------|
| 1. Attendance/Participation | 10% |
| 2. Student Experiments/Activities | 15% |
| 3. Quizzes | 15% |
| 4. Assignments | 15% |
| 4. Midterm Exam | 15% |
| 5. Final Exam | 15% |
| 6. Classroom teaching | 15% |
| | <hr/> |
| | 100% |

-Failure in any one category can result in failure for the course. An “A” grade generally requires excellence in ALL categories.

Grades:

A: 90-100

B: 80-89

C: 70-79

D: 60-69

F: <59

Assignments

Should be typed unless otherwise stated. Please include your name, course number, date and assignment title on everything you turn in to me. If an assignment contains multiple pages, please staple them together before turning it in. Legibility: if I can't read it, it's wrong.

Standards

The content and experiences of his course align with multiple professional standards. Refer to http://coehd.uno.edu/educ/table_alignment.cfm for more information.

Field experiences in this course (observations, teaching) help candidates to address unit, state, and national standards. Candidates are required to enter both the location number of field experience hours completed to meet the requirements of this course in to Live Text (the e-portfolio system). This requirement must be completed to earn any credit aligned with field experience assignments.

This course includes a candidate assessment that is a requirement for program progression.

COMPASS STANDARDS

- 1c. SETTING INSTRUCTIONAL OUTCOMES
- 2c. MANAGING CLASSROOM PROCEDURES
- 3b. USING QUESTIONING AND DISCUSSION TECHNIQUES
- 3c. ENGAGING STUDENTS IN LEARNING
- 3d. USING ASSESSMENT IN INSTRUCTION

| OBJECTIVES | UNIT STANDARD | STATE STANDARD |
|--|---------------|----------------|
| -Demonstrate strategies for teaching and acquisition of concepts and computational | 1A4, IIA7, | 1c, 3b, 3c, 3d |

| | | |
|---|---------------------------|------------|
| skills | | |
| -Develop and teach reform-based lessons to children based on the Louisiana Components of Effective Teaching | IB1, IIA1, IIA2, | 2c, |
| -Identify and explore strategies adaptable for different populations of students | IIID1,2,3; IIA6, | 3c, 3d, 1c |
| -Engage students in hands-on, inquiry-based lessons | IA1, 4; IIIA1,2,3; IIIC2, | 3c |
| -Access and use national and state standards for elementary science teaching | IIA2, 4; | 1c |
| -Understand key components of science from Biology, Earth Science, Chemistry and Physics | IIA1,2; IIIB1,2 | |

Conceptual Framework

Our conceptual framework, the theory-practice-research interaction model, permeates the programs preparing candidates for professional roles in school settings. As candidates progress through their professional studies, they are introduced to formal theories and concepts that are validated by research, which along with their personally held beliefs and assumptions, inform their professional practice. The roles and responsibilities set out the broad domains for developing competence of teacher candidates viewed through the lens of the theory-practice-research interaction model. As candidates engage in various clinical and field experiences included in their program of study, observation and study of professional practices inform and refine the educational theories and concepts they construct. Our goal is to have our candidates internalize the theory-practice-research interaction model, as they develop into reflective practitioners constantly reassessing the educational theories, beliefs, and assumptions they embrace.

Objectives Alignment with Unit and State Standards

In addition to the identified goals and objectives, this course addresses UNO Teacher Roles and Louisiana State COMPASS Standards.

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| I. EFFECTIVE TEACHERS MANAGE CLASSROOM CONTEXTS AND |
|--|

ENVIRONMENTS

A. They establish a culture for learning by:

1. Managing classroom procedures (**COMPASS 2c**)
2. Managing student behavior
3. Organizing physical space
4. Organizing classrooms to integrate technology
5. Maintaining accurate records using available technology

B. They create an environment of respect and rapport by:

1. Using cultural contexts in the classroom
2. Demonstrating knowledge of diversity among students
3. Presenting rationales for change to meet students needs

II. EFFECTIVE TEACHERS *DESIGN CURRICULUM AND INSTRUCTION*

A. They understand and use curriculum and instruction by:

1. Knowing content
2. Knowing pedagogy
3. Setting instructional outcomes (**COMPASS 1c**)
4. Designing coherent instruction
5. Designing student assessments
6. Incorporating knowledge of diversity in the classroom
7. Planning for the use of technologies in curriculum and instruction
8. Demonstrating knowledge of resources, including technologies
9. Planning for the use of collaborative group practices in the classroom

B. They communicate effectively by:

1. Incorporating effective written communication in the classroom
2. Incorporating effective oral communication in the classroom

III. EFFECTIVE TEACHERS *DELIVER INSTRUCTION AND ASSESS LEARNING*

A. They engage students in active learning (COMPASS 3c**) by:**

1. Interacting effectively with students
2. Demonstrating flexibility and responsiveness
3. Integrating technology and other resources

B. They integrate disciplines into instruction by:

1. Applying connections to multiple disciplines
2. Demonstrating connections to real life

C. They use assessment in instruction by:

1. Incorporating performance tasks in the classroom
2. Using questioning and discussion techniques (**COMPASS 3b**)
3. Using pre-assessment, formative assessment, and summative assessment appropriately (**COMPASS 3d**)

D. They embed diversity in decision-making by:

1. Selecting resources
2. Delivering instruction
3. Assessing learning

IV. EFFECTIVE TEACHERS *PARTICIPATE IN PROFESSIONAL RESPONSIBILITIES*

A. They advocate for children, in terms of services and supports by:

1. Communicating with families
2. Demonstrating knowledge of resources in school and the community

B. They collaborate to improve professional practice by:

1. Engaging in a professional community

2. Participating in professional development
3. Collaborating with teachers and mentors
4. Developing goals for social justice
5. Using research-based practices that include current available technology

C. They reflect on teaching and learning by:

1. Focusing on cultural contexts and social justice
2. Collecting and analyzing data to improve practice

➔ Teacher Candidates will demonstrate competencies in integrating Common Core State Standards in lesson plans, unit plans, an