

Elementary Science Methods  
ED 4330  
Spring Semester 2010

**COURSE SYLLABUS**

**Richard Pontius, Ph.D.**

OFFICE: ED 4330  
OFFICE HOURS: M 7:30-8:15 AM and M 11:30 AM-12:15 PM during 4330 and by appointment  
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**REQUIRED TEXTBOOKS OR READINGS:** None

**METHODS OF INSTRUCTION:** This course requires the active participation of students. Methods of instruction include: lecture / demonstration; laboratory; media presentations; review and analysis of teaching strategies / materials; library research; collaborative/cooperative learning.

**Level 3 Website:** <http://departments.weber.edu/teachereducation/level3/> Additional information for level 3 including the Level 3 Handbook and TWS Guide may be found on this website.

**LEARNING GOALS FOR CANDIDATE PERFORMANCE:**

1. Performance Excellence: Demonstrate readiness to assume responsibility for classroom teaching by facilitating hands-on and minds-on, elementary level *science-related learning activities*.
  - a) Create, modify and assess appropriate curricula to meet cognitive, affective, and psychomotor learning objectives in science education.
  - b) Use a variety of instructional strategies and resource materials related to the teaching of science.
  - c) Demonstrate effective instructional practices, including effective communication and classroom management skills.
2. Diversity and Collaboration: Demonstrate respect and value for human diversity and the ability to work with others.
3. Technology: Demonstrate the ability to use information technology to support student learning and personal productivity; and use appropriate available technology for the development /enhancement of the curriculum.

4. Use assessment to evaluate and improve student learning and personal instructional practice. This includes assessment of children's prior knowledge to identify possible naïve beliefs or misconceptions about fundamental science concepts.
5. Continuous Improvement: Demonstrate a commitment to professional growth and to make contributions to the profession.

*The instructor reserves the right to modify any grade based on student's professional behaviors or lack of them.*

### **Ethics**

Failure to maintain academic ethics/academic honesty including the avoidance of cheating, plagiarism, collusion, and falsification will result in an F in the course, and may result in charges being issued, hearings being held and/or sanctions being imposed.

### **Teacher Education ADA Requests**

Any student requiring accommodations or services due to a disability must contact university services for students with disabilities (SSD) in room 181 of the student service center. SSD can also arrange to provide course materials in alternative formats if necessary.

### **FOR ALL ASSIGNMENTS:**

1. **All assignments should be typed.**
2. **Web sites may not serve as appropriate references for many of the assignments because of the lack of a review process for many of these sites (i.e.: anyone can publish anything on the web, it does not necessarily mean that the writing/ideas have been reviewed by professionals).**
3. **All assignments should relate to the teaching of *science* as opposed to general teaching methods.**
4. **Assignments are due at the beginning of class. Assignments turned in past the due date will be accepted for reduced credit (a reduction of 20% if in before or on next class date, 10% each additional class period).**
5. **All assignments are expected to be the individual student's original work and writing. Any quoted material should appear in quotations and be properly referenced with page numbers (APA style). This means that work from other students should also be referenced. Paraphrased material should be referenced using APA style. Cheating and plagiarism are considered a serious breach of professional ethics. Additional information on plagiarism may be found in the student Code of Conduct at <http://documents.weber.edu/ppm/6-22.htm>**

### **Attendance and Participation (20 points)**

Maximum benefit for students involves, not only engaging in the hands-on activities provided, but also sharing with others your personal ideas, plans, feelings, and experiences. Regular attendance and class participation is extremely important in this course. Participating in class activities and experiments is an integral component to success in this class. Each student is expected to prepare for, and take an active part in, class discussions, activities, and collaborative group work. This work also involves completing assigned reading and homework. **Credit is earned for full, positive, participation at each class period.** Arriving late or leaving early will influence the number of points. Because of the nature of class activities, it will be impossible to make up missed class time. Points will not be earned for missed sessions, irrespective of the nature of the absence, and students need not provide a reason.

### **COURSE REQUIREMENTS AND GRADING:**

**Important: All work should be word processed and double spaced. It is expected that all work will be related to the teaching of science. Spelling, grammar, and the development of ideas are included in the grading criteria. Please ask others to proofread your final work.**

**Please refer to the Assignment Guide for additional information for each assignment and grading criteria.**

Assignment	Points
Participation and Attendance	20
Science and Children Report	20
Science activity Critique (2)	20
Field Trip Plan	20
Field Experience Evaluation	20
10 points from Instructor	
10 points from classroom teacher	
<b>Total Points</b>	<b>100</b>
A	= 91.5 - 100 points
A-	= 89.5 - 91.49 points
B+	= 88.5 – 89.49 points
B	= 81.5 – 88.49 points
B-	= 79.5 - 81.49 points
C+	= 78.5 – 79.49 points
C	= 71.5 – 78.49 points
C-	= 69.5 – 71.49 points

### **INTASC Standards addressed in Level 3**

1. Content Pedagogy
2. Student Development

4. Multiple Instructional Strategies
5. Motivation and Management
7. Planning
8. Assessment
9. Reflective Practice: Professional Growth

## **BIBLIOGRAPHY:**

Abruscato, J. (1995). Teaching children science: A discovery approach. Boston: Allyn and Bacon.

American Association for the Advancement of Science (AAAS) (1993). Project 2061: benchmarks for science literacy. New York: Oxford University Press.

Barba, R. H. (1998) Science in the multicultural classroom (2nd Ed.) Boston: Allyn and Bacon.

Cohen, H., et al. (1990). Teaching science as a decision making process. Dubuque, IA: Kendall Hunt.

Krajcik, J., Czerniak C., & Berger, C. (1999). Teaching children science: A project-based approach. Boston: McGraw Hill College

Lorbeer, G (1992). Science activities for elementary children (9th ed.), Vol. I, II. Dubuque, IA: W. C. Brown.

Martin, D. J. (1997). Elementary science methods: A constructivist approach. Detroit: Delmar Publishers.

Martin, Jr., R. E., Sexton, C., Wagner, K, & Gerlovich, J. (1994). Teaching science for all children. Boston: Allyn and Bacon.

National Research Council (NRC) (1995). National science standards. Washington DC: National Academy Press.

Rutherford, J. & Algrehn (1990). Science for all americans. Washington, DC: American Association for the Advancement of Science (AAAS).

Stepans, J. (1996). Targeting students' science misconceptions. Riverview, FL: Idea Factory.

Tolman, M. N. & Hardy, G. R. (1995). Discovering elementary science. Boston: Allyn and Bacon.

## **RECOMMENDED REFERENCES:**

Bosak, S. V. (1991). Science is. . . Ontario, Canada: Scholastic Canada LTD.

Zike, D. (1994). Big book of books. San Antonio, TX: Dinah-Might Activities.

Zike, D. (1999). Big book of holiday activities. San Antonio, TX: Dinah-Might Activities.

Zike, D. (1998). Big book of projects. San Antonio, TX: Dinah-Might Activities.

Zike, D. (1999). Great tables, graphs, charts, diagrams, and timelines you can make. San Antonio, TX: Dinah-Might Activities.

### **Important Web Addresses:**

#### **Utah Science Standards:**

<http://www.usoe.k12.ut.us/curr/science/>

**National Science Teachers Association (NSTA):** [www.nsta.org](http://www.nsta.org)

#### **Misconceptions Information:**

Various Topics: [www.pitt.edu/~vtalsma/syllabi/2943/handouts/misconcept.html](http://www.pitt.edu/~vtalsma/syllabi/2943/handouts/misconcept.html)

[www.pitt.edu/~vtalsma/syllabi/2943/handouts/misconcept.html](http://www.pitt.edu/~vtalsma/syllabi/2943/handouts/misconcept.html)

#### **National Science Education Standards:**

[www.nap.edu/readingroom/books/nses/html](http://www.nap.edu/readingroom/books/nses/html)

### **RECOMMENDED JOURNALS AND PERIODICALS:**

Science and Children - NSTA monthly elementary periodical

Science Scope - NSTA monthly middle school periodical

The Science Teacher - NSTA monthly secondary science periodical (secondary)

Project 2061 (AAAS Report)

CESI Science - Council for Elementary Science International (CESI)

Great Exploration in Math and Science (GEMS) - supplemental resources

Activities that Integrate Math and Science (AIMS) - supplemental resources

Full Option Science Systems (FOSS) - kit based programs

Science Teaching and Children (STC) - kit based programs

Dragonfly (student publication)

Ranger Rick (student publication)

WonderScience - American Chemical Society (student publication)

Science World - published biweekly by Scholastic (student publication)

Students are encouraged to become members of the National Science Teachers Association (NSTA) at the student rate. By doing so, students will be able to subscribe a professional journal (e.g., *Dragonfly*, *Science and Children* - included with membership). This is a good deal!!!