

ED 688
SCIENCE METHODS AND CURRICULUM DEVELOPMENT
OFF-CAMPUS, FALL SEMESTER

COURSE INFORMATION

Credits: 3

Prerequisites: Participating in the Internship Year or Permission of Instructor

Location:

- Audio-Conference Number 1-800-570-3591 & Pin Number: 6944438
If problems are encountered please call Customer Service at 1-800-290-5900. Have the course number and instructor information available.
- Blackboard: <http://classes.uaf.edu>
Course Site: [ED F479 F688 STACKED 201103 \(CRN 77957, 77967\) Science Methods & Curriclm Dev](#)

Meeting Time: Dates and times noted on the internship calendar and on the syllabus calendar

INSTRUCTOR INFORMATION

xxx (2.5+0+4)

Carin, Arthur A., et al. 2005. *Teaching Science as Inquiry, Eleventh Edition*. Pearson Education, Inc.: Upper Saddle River, NJ.

Campbell, Brian and Fulton, Lori. 2003. *Science Notebooks: Writing About Inquiry*. Heinemann: Portsmouth, NH

National Science Teacher Association – Student Membership

<http://www.nsta.org/membership/student.aspx>

Select *Science and Children* (grades K–6) for the journal you receive with your membership

National Research Council. 2011. *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. National Academy Press: Washington, DC. [online] http://www.nap.edu/catalog.php?record_id=13165

National Research Council. 1996. *National Science Education Standards*. National Academy Press: Washington, DC. [online] <http://www.nap.edu/readingroom/books/nses/>

Alaska State Board of Education & Early Development. 2005. *Standards: Content & Performance Standards for Alaska Students, Third Edition*. Alaska Department of Education & Early Development: Juneau, AK. [online] <http://www.eed.state.ak.us/standards/>

American Association for the Advancement of Science. 1989.

Oxford University Press: New York, NY. [online]

<http://www.project2061.org/publications/sfaa/online/sfaatoc.htm>

American Association for the Advancement of Science. 1993. *Benchmarks for Science Literacy*. Oxford University Press: New York, NY. [online]

<http://www.project2061.org/publications/bsl/online/bolintro.htm>

American Association for the Advancement of Science. 2001 and 2007. *Atlas for Science Literacy Volumes 1 and 2*. Oxford University Press: New York, NY. [online]

<http://www.project2061.org/publications/atlas/default.htm>

American Association for the Advancement of Science. 2011. Project 2061 Science Assessment Website. [online] <http://assessment.aaas.org/>

Annenberg Media “Video-on-Demand” (VOD) Series www.learner.org

If available, science curriculum framework for your school district

If applicable, science textbook for your students/grades

Household materials may be required for lab investigations TBA

Additional Readings or Resources TBA

COURSE DESCRIPTION

Study and application in the classroom of the best practices from research-based strategies for the teaching and learning of science concepts, content and methods for students in elementary classrooms with diverse populations. Requires development and classroom implementation of science unit. Classroom internship required. Prerequisites: Admission to the post-baccalaureate elementary licensure program; graduate standing; or permission of instructor. Stacked with ED F479. (2.5+0+1.5)

COURSE GOALS

“Effective science teaching is more than knowing science content and some teaching strategies. Skilled teachers of science have special understandings and abilities that integrate their knowledge of science content, curriculum, learning, teaching, and students. Such knowledge, called ‘pedagogical content knowledge,’ distinguishes science knowledge of teachers from that of scientists. It is one element that defines a professional teacher of science.”

– National Science Education Standards, Chapter 4

The goal of this course is to prepare interns to be a professional teacher of science. Interns will study the various aspects of pedagogical content knowledge mentioned above. Students will become familiar with current research and recommendations for science education. Science standards and inquiry-based learning will be emphasized. Interns will have the opportunity to practice and reflect on their science learning experiences.

STUDENT LEARNING OUTCOMES

Outcomes that align with the National Science Teacher Association’s are shown in the course diagnostic assessment. Some general goals follow. Through study, experience and reflection, students will:

- Understand methods for teaching and learning science through inquiry;
- Be familiar with National, State and local standards for content, performance & practice;
- Become adept using research-based methods/strategies for teaching and learning;
- Understand and use knowledge of learning, pedagogy and students to create appropriate, relevant learning opportunities for diverse groups of students;
- Create and use multiple assessment strategies in the context of teaching a science unit;
- Plan and implement a holistic science unit; and
- Reflect on science topics, personal ideas, future goals and experiences as a science educator.

F 59% or below

As one of the culminating courses of the internship year, students are required to earn a “C” or better in order to successfully complete the licensure program. In addition to obtaining minimum grade requirements, students must meet all required ESAAP competencies in order to pass the class and continue with the internship. Any student in jeopardy of failing should contact the instructor to discuss options.

CALENDAR

Please note, that this is a tentative schedule and it may be modified. Homework assignments listed for each class are your major assignments and you should be prepared to discuss them during our next audio-conference. Additional readings/work will be announced in class each week. Additional readings will be posted on the Blackboard site.

Wednesday, August 24th 9:00-12:00

Bring these items to class (or be on the internet to access online versions):

- AAAS Benchmarks for Science Literacy (Link on Blackboard)
- National Science Education Standards (Link on Blackboard)
- Alaska Content Standards for Science & Grade Level Expectations (Link on Blackboard)
- Science curriculum for your school district
- Documents from Blackboard

Audio-conference:

- What do we currently think about science education? (Diagnostic assessment)
- Course business... syllabus, etc.
-



Due today:

Posted reflection to science lesson due on Blackboard **Sept 12-16**

Respond, critically, to at least two colleagues' reflections **Sept 17-23**

Unit Planning Worksheet 2: Assessment & Instruction

Audio-conference:

- NSTA Standards 5 & 8: What does it mean that assessment and instruction are two sides of the same coin? (Continued)
- What is assessment and how do I do it?
 - o How do I use rubrics?
- How do I teach science and manage learning? What instructional methods exist? (Methods Specific)
 - o Science Notebooks, Interdisciplinary Learning, Collaborative Learning, Etc.

Homework:

1) Continue drafting unit

2) Watch *A Private Universe*

3) *Chapter 3, Learning Science with Understanding*

Chapter 10, Science for All Learners, Pages 253-267. (We will read the second part of the chapter after our next class.)

Reading TBA

4) (Optional) Bring a resource to class

Due today:

Unit Planning Worksheet 3: Relevancy & Differentiation

Draft Science Unit

Audio-

November 21st – December 2nd

NSTA Standard 6:

TEACH Science Unit (5 days total)

Homework:

1) **Final reflections** (i.e. while you are teaching you should be writing daily reflections, collecting samples of student work, taking photos, etc.) are **due December 9th**.

2) **ED 688 Students Independent Projects Due on December 9th**.

3) (Optional) Bring a resource to class (post resource in Blackboard Discussion Forum)

Friday, December 9th 9:00-12:00

Due today:

Final reflections

ED 688 Student's Independent Projects Due

Audio-conference:

- How do I feel about teaching and learning science?
 - o Share your final reflections on teaching your science unit
- What is my understanding of science and science education now?
 - o Share your course summative assessment
-

