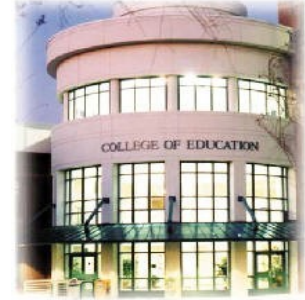




SCE 4310 – Teaching Elementary School Science

COLLEGE OF EDUCATION
Program in Science
Education



The Conceptual Framework of the College of Education:

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*The College of Education is dedicated to
the ideals of
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Competence in
these ideals will provide candidates in educator preparation programs with skills,
knowledge, and dispositions to be successful in the schools of today and tomorrow.
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Course Prefix/Number SCE 4310 Section 902

Credit Hours 3 hours

Course Title Teaching Elementary School Science

Instructor Information Sami Kahn
Office: EDU 302R
Phone: (646) 732-5389
Email: samikahn@mail.usf.edu
Office Hours: Wednesdays 2:00 – 4:00 p.m. and by appointment.

Course Meeting Time Wednesdays from 5:00 p.m.– 9:15 p.m. in EDU 313

Course Prerequisites There are no prerequisites for this course

Course Description

Welcome to SCE 4310!

This course will provide you with the tools and strategies to feel confident and be competent in teaching science at the elementary level. Through consideration of the nature of science as a practice which requires certain, “habits of mind,” we will venture to develop those habits which will help you to foster and model a dynamic, working scientific community in your classroom. This course will combine pedagogical strategies, science content and process skills, as well the philosophical and historical underpinnings of constructivist elementary science teaching and learning in a (hopefully) seamless manner through a series of hands-on, inquiry-based activities designed to promote active engagement for you and model inquiry for your classroom.

This is an active course which emphasizes practical, real-world strategies to help you develop and implement meaningful science inquiry lessons for *all* elementary students, design a range of appropriately-aligned assessments, collaborate and integrate with other subject areas and teachers, utilize science-related resources in your community, and become a leader in science education at your school and beyond. In short, this course is designed to have you “up and running” in your science classroom from day one...if you do *your part!*

Course Objectives

Through this course of study, you will:

- Examine the nature of scientific inquiry through modeling hands-on, minds-on activities that foster scientific “habits of mind” and promote scientific literacy.
- Develop an understanding of the role of the elementary classroom teacher as a facilitator for scientific learning, promoter of social, literacy, and numeracy skills, practitioner of interdisciplinary teaching and learning, and responsible and collaborative member of the school and scientific community.
- Design, develop, and implement meaningful science course content utilizing an array of research-based pedagogical approaches that foster scientific learning and literacy for all students.
- Practice skills related to elementary pedagogy (e.g. developing 5E Learning Cycle lesson plans, utilizing Universal Design for Learning principles, implementing cooperative learning) and science process skills (e.g. questioning, hypothesizing, recording and analyzing data, communicating scientific ideas, evaluating “everyday” science issues) while developing stronger science content skills in life, physical, and earth science topics.
- Create a series of materials which can serve as the framework of your curriculum as a new (and outstanding) elementary science teacher!

Evaluation of Student Outcomes

Grading (100 points)

Scoring rubrics will be provided for each of the following:

- 1) Learning Reflections – Short (1 pg.) reflections of your thoughts, questions, learnings, breakthroughs, challenges, or anything else you ponder in relation to our course that week. 6 reflections @ 5 pts. each = 30 pts.
- 2) 5 Skill-Building Activities (5 pts. each = 25 pts.):
 - a. 5E Learning Cycle Lesson Plan;
 - b. Universal Design for Learning (UDL) Analysis of Lesson;
 - c. Graphic Organizers Challenge – Develop and/or adapt a graphic organizer for a selected lesson.
 - d. Interdisciplinary Lesson - incorporating at least *two* other disciplinary standards alignments (i.e., social studies, math, language arts, technology, etc...);
 - e. Article Review – *Science & Children*
- 3) Science Content Expert – Develop expertise (with partner) in one science topic selected during the first day of class and serve as content expert for that topic's scheduled day; provide students with outline/references/resources on topic. 10 pts.
- 4) Class Participation – Energetic, informed, curious, challenging, dynamic participation is encouraged! 5 pts.
- 5) Final Unit – Development and presentation of integrated “science on a shoestring” elementary science unit of your choice (teams up to 3 people) - 30 pts.

Grading Criteria

Letter grades will be assigned using the following standards:

- A+ = 97% or better
- A = 93-96%
- A- = 90-92%
- B+ = 87-89%
- B = 83-86%
- B- = 80-82%
- C+ = 77-79%
- C = 73-76%
- C- = 70-72%
- D+ = 67-69%
- D = 63-66%
- D- = 60-62%
- Failing below 60%

Incomplete (I) grades will only be given under special circumstances through arrangement with me. **No grade below “C” will be accepted toward a graduate degree.** Please speak to me as soon as possible if issues arise regarding assignments, course participation/completion, illness, or any other situations which impact your progress in this course. I will do my best to work with you to resolve them in a fair and mutually-agreeable manner, if possible.

Course Outline (subject to change)

SCE 4310 – Elementary Science Teaching

S. Kahn

Week	Science Theme *	Pedagogical Skills/Approaches	Assignments
1 5/15/13	Science as Inquiry	5E Learning Cycle Integration of Children's Literature Mystery Objects Science Standards Alignment	Readings: 1,2, 3 & 4
2 5/22/13	Properties of Matter	Use of Discrepant Events Science Stations Universal Design for Learning Confirmation and Structured Inquiry	Readings: 5,6,7 & 8
3 5/29/13	Earth's Natural Resources	Cooperative Learning Differentiated Instruction Integration of Math, Social Studies, and Technology	Readings: 9 & 10 Due: 5E Learning Cycle
4 6/5/13	Ecology and Environment	Guided Inquiry Science in Context Use of Scientific Instruments Science Graphic Organizers	Readings: 11, 12, & 13 Due: UDL Lesson
5 6/12/13	Botany Day	Experimental Design Outdoor Learning Creation of Science Artifacts	Readings: 14, 15, & 16 Due: Graphic Organizer Challenge
6 6/19/13	Animals in the Classroom	Writing for Science Scaffolding Inquiry Fiction vs. Non-Fiction Reading Socioscientific Issues	Readings: 17, 18, & 19
7 6/26/13	Weather	Use of Instruments in Science Observation and Measurement with Young Students Family Involvement in Science	Readings: 20, 21, & 22 Due: Interdisciplinary Lesson
8 7/3/13	NO CLASS	Work on your Final Projects	
9 7/10/13	Energy, Forces and Motion	Reading Comprehension Strategies Historical Perspectives in Science Brainstorming and Questioning Strategies	Readings: 23, 24, & 25 Due: S&C Article Review
10 7/17/13	Science on a Shoestring Units	Design of Integrated Science Unit	Student Presentations and Sharing of Units

*Note that "evolution readiness" will be an overarching science theme of the course.

Required Text and Readings

Required Text: There is no required text for this course.

Required Readings: Readings from elementary science practitioner journals, excerpts from book chapters, and podcasts will be provided throughout the course and accessible on the course's Blackboard site under "Assignments." A reading list is provided at the end of this course syllabus. Most of these are short (3-4 pages) articles, written by practicing elementary teachers or scholars in the field of science education research. I believe you will find them to be engaging, thought-provoking, inspiring, and quite useful. Please have readings prepared for discussion on the date listed on the syllabus; in other words, the dates listed on the syllabus are the "due dates" for the readings, not homework for the following week.

Course Policies

ADA Statement

Students in need of academic accommodations for a disability may consult with the office of Services for Students with Disabilities to arrange appropriate accommodations. Students are required to give reasonable notice (typically 5 working days) prior to requesting an accommodation. Please speak to me as early as possible in the semester so that we can develop a thoughtful accommodation plan.

Attendance

Attendance is mandatory and unexcused absences will negatively affect your grade. It is expected that you will telephone or e-mail me in advance of an absence. Students who anticipate the necessity of being absent from class due to the observation of a major religious observance must provide me a notice of the date(s), in writing, by the second class meeting.

Tardiness

Please arrive to class on time. We will frequently begin activities with teammates at the start of class. Your success and that of your team's depends on your full participation. To that end, repeated (two or more) unexcused incidences of tardiness (15 minutes or more) will be considered grounds for reduction of course grade by one full letter grade.

Assignments

Assignments are due on the date listed on the syllabus. I reserve the right to refuse any late assignment. If an assignment is accepted past the time of the due date it will be subject to reduction of one letter grade of the assigned value unless there are serious extenuating circumstances which have been communicated to me either before the assignment due date or as soon as practicably possible thereafter. Also, please maintain copies of all assignments. In the unlikely event I misplace a submitted assignment, the burden will rest upon you to provide an additional copy.

Academic Dishonesty

Plagiarism is defined as "literary theft" and consists of the unattributed quotation of the exact words of a published text or the unattributed borrowing of original ideas by paraphrase from a published text. On written papers for which the student employs information gathered from books, articles, or oral sources, each direct quotation, as well as ideas and facts that are not generally known to the public-at-large, must be attributed to its author by means of the appropriate citation procedure. Citations may be made in footnotes or within the body of the text. Plagiarism also consists of passing off as one's own, segments or the total of another person's work. Punishment for academic dishonesty will depend on the seriousness of the offense and may include receipt of an "F" with a numerical value of zero on the task, and the "F" shall be used to determine the final course grade. It is the option of the instructor to assign the student

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a grade of "F" or "FF" (the latter indicating dishonesty) in the course.

The University of South Florida has an account with an automated plagiarism detection service that allows instructors to submit student assignments to be checked for plagiarism. I reserve the right to 1) request that assignments be submitted to me as electronic files and 2) electronically submit to SafeAssignment.com, or 3) ask students to submit their assignments to SafeAssignment.com through myUSF. Assignments are compared automatically with a database of journal articles, web articles, and previously submitted papers. The instructor receives a report showing exactly how a student's paper was plagiarized.

Web Portal Information

Every newly enrolled USF student receives an official USF e-mail account that ends with "mail.usf.edu." Every official USF correspondence to students will be sent to that account. Go to the Academic Computing website and select the link "Activating a Student E-mail Account" for detailed information. Information about the USF Web Portal can be found at: <http://www.acomp.usf.edu/portal.htm>.

Final Comments: I am looking forward to a wonderful summer of learning together. You each bring a wealth of information and experience that will be tremendously useful to our class and to your new career as an elementary teacher. Please come with an open mind, a sense of adventure, and an understanding that science is about to become your favorite subject!

Kahn, S. – SCE 4310 - Reading List

- | # | Reading |
|----|--|
| 1 | Lederman, N.G. A powerful way to learn. S&C Sept. 2010 |
| 2 | Bybee, R. W. Inquiry is Essential. S&C. Mar. 2011 |
| 3 | Bell, R., Smetana, L. & Binns, I. Simplifying Inquiry Instruction. <i>The Science Teacher</i> , Oct. 2005 |
| 4 | Bell, R. <i>Teaching the Nature of Science: The Three Critical Questions</i> . |
| 5 | Carrier, S. J. & Thomas, A. B., Button Basics, S&C. Jan. 2008 |
| 6 | Rose, D. H., & Gravel, J. W. (2010). Universal design for learning. In P. Peterson, E. Baker & B. McGraw (Eds.), <i>International Encyclopedia of Education</i> (pp. 119-124). Oxford: Elsevier. |
| 7 | Steele, M.M. Science Success for Students with Special Needs. S&C Oct. 2007 |
| 8 | Cox-Petersen & Olson, J. Alternative Assessments for English Language Learners. S&C Feb. 2007 |
| 9 | Tedford, R. & Warny, S. – Layer-Cake Earth. S&C, Dec. 2006 |
| 10 | Kahn, S. Gold rush!, S&C, March 2009 |
| 11 | Frissell, V. and Cayton, Becoming Wildlife Investigators, S&C 2009 |
| 12 | Struble, J. Using Graphic Organizers as Formative Assessment. <i>Science Scope</i> , Jan. 2007 |
| 13 | Wolfinger, D.M. A New Use for Semantic Maps. S&C, Jan. 2006 |
| 14 | McNall, R.L. and Bell, R. Discovering flowers in a new light S&C 2004 |
| 15 | Kirby, T. A garden of learning, S&C summer 2008 |
| 16 | Davison, S. A picture is worth a thousand words, S&C Jan. 2009 |
| 17 | Zeidler, D.L. & Nichols, B.H. (2009). <i>Socioscientific Issues: Theory and Practice. Journal of Elementary Science Education, Vol. 21, No. 2 (Spring 2009), pp. 49-58.</i> |
| 18 | Pieczura, M. E. Dare to disagree, as scientists S&C Nov. 2009 |
| 19 | Akerson, V.L. & Young, T.A., Science the Write Way, S&C, Nov/Dec 2005 |
| 20 | Coskie, T.L. & Davis, K.J., Organizing Weather Data, S&C, Jan 2009 |
| 21 | Glen, N.J. & Smetana, L.K. Dress for the Weather, S&C, April/May 2010 |
| 22 | Sullivan, J. and Hatton, M. Math and Science Night. S&C Jan. 2011 |
| 23 | Glen, N. How many ways are there to move? S&C. Oct. 2011 |
| 24 | Eichinger, J. Investigating with Charles Darwin. S&C. Oct. 2008 |
| 25 | Kahn, S. Savvy consumers through science. S&C. March 2005 |

S&C = *Science and Children*