UNLV – College of Education

Preparing Professionals for Changing Educational Contexts

Department of Teaching and Learning
Inquire. Educate. Innovate.

Course Information

Prefix & Number	EDEL 443
Title	**TEACHING ELEMENTARY SCHOOL SCIENCE**
Credits	3 Credit Hours
Semester	
Instructor	
Office/Phone/Email	
Class Location	
Office Hours	
Prerequisites	BIOL 100, GEOG 101, 103, CHEM 105, 106, and admission to Elementary Education Program. **Corequisite:** Concurrent enrollment in a practicum.
Course Description (Course Introduction)	From the UNLV Undergraduate Catalog: Current methods and materials for teaching life, physics, and earth science using process skills, guided discovery activities, and curriculum integration techniques.
SPA Standards Addressed: Standard Domain Areas Addressed in this Course **INTASC Principles Addressed in this Course (please insert three subcomponents to them (performance,**	

essential knowledge, and critical dispositions	

Course Goals and Expectations

In this course we will explore the teaching of science, investigating both *what* to teach and *how* to teach. We will explore what it means to do science and what it means to understand science through individual, small group, and large group problem solving. We will investigate ways to represent understandings of science concepts, communicate science ideas, and construct scientific arguments. We will investigate and read about ways children might represent science concepts, looking at ways to help children build connections and see relationships among scientific ideas. We will explore characteristics of a classroom environment conducive to scientific learning by reading and discussing the importance of scientific investigations, scientific tools, the roles of teachers and students, and the assessment of scientific understanding. Class attendance is essential (see class participation), as class sessions are interactive and include a variety of hands-on, minds-on, inquiry-based, and constructivist teaching and learning techniques. Additionally, you will learn to integrate instructional technology to emphasize the learning of science content. The learning objectives include:

- Define key terms in science;
- Relate theory to practice;
- Develop conceptions of nature of science and scientific inquiry;
- Describe techniques and strategies for teaching science;
- Develop strategies to integrate science instruction with other content areas, such as reading, writing, and mathematics;
- Develop skill in using metric (SI) measurement as a critical component of scientific inquiry;
- Teach science from an inquiry-based, hands-on perspective;
- Show how to integrate technology in science teaching;
- Understand the contribution of science and technology to the development of civilization;
- Exhibit positive attitudes about teaching science;
- Demonstrate confidence in using various science curriculum materials;
- Create age- and subject-appropriate lesson plans that are aligned to Next Generation Science Standards.

Evaluation

There are six (6) different components to your grade, as described below. Detailed instructions and grading rubrics will be provided for each of these as the course progresses.

Points	Assignment
20%	*Science Notebook* You will be asked to keep a science notebook during this class. Your use of science notebook will mimic how scientists or elementary students might use science notebooks during scientific investigations and science lessons. You will be expected to record and organize data, make technical drawings and diagrams, reflect on science scientific ideas and questions using your notebook.
30%	*Interview a Child for Ideas on a Science Concept* The purpose of this assignment is to give you experience in eliciting children's ideas about a science concept. You will study a science content area and design an interview questionnaire. You will check to see whether the student has met the *science standards* for your chosen content area. You will turn in a report of your findings.
10%	*Science Lesson Plan related to Your Interview Topic* The purpose of this project is to provide you with experience with planning lessons to address student conceptions in science. You will consider developmentally appropriate activities that can help students increase their knowledge of science content. You will need to consider objectives, activities, and assessment strategies with each lesson. The lesson will be designed to meet the criteria. You will write a lesson plan addressing the concept you selected for interview. You should develop a lesson that will help students confront their ideas. You should use your interview responses to help you plan the lesson. You will match the lesson to *Next Generation Science Standards* for your given grade level and content area. Include suggestions for interdisciplinary connections.
20%	*Writing a Science Book for Children or* develop two more science lesson plans (10 percent each) The purpose of "Writing a Science Book for Children" is to provide you with experience in writing a children's book related to your science lesson plan.
10%	*Lesson Presentations* You will teach a mini version of your science lesson
10%	*Attendance and Participation in Weekly In-Class Explorations*

	The purpose of the emphasis on attendance and participation is to provide you experience in participating and drawing conclusions from investigations, and to familiarize you with ways of conducting investigations to meet the *Standards.* There is no substitute for engaging in the hands-on investigations, and you must be present to do so. Attendance and participation in class is mandatory.

**Assignments are due at the start of class unless otherwise indicated.

Grades will be assigned according to the following scale:

100-94% = A	89-87% = B+	79-77% = C+	69-60% = D
93-90% = A-	86-83% = B	76-73% = C	59-0% = F
	82-80% = B-	72-70% = C-	

Class Participation

Participation in this course is very important, as we will do many in-class activities to develop your science pedagogical content knowledge. Although your grade initially will be determined by the results of the assignments above, it can be reduced for excessive absences or tardies as follows:

1) *Each* absence above two will result in the reduction of your grade by 5%.
2) Three tardies = one absence, and counts as part of those in (1).

You should notify me, preferably *in advance*, if you know you will be absent or tardy from class. You are responsible for turning in assignments on the due date, emailing them if necessary.

Schedule

Below is a rough outline of the course. Topics may be adjusted as needed. Additional readings may be assigned as we go.

R = Reading to be completed BEFORE the start of class on the date listed

A = Assignment due at the START of the class on the date listed

ICA = In class activity

Week	Topic	Readings, Activities, and Assignments
January 18	MLK Day Recess	
January 25	Intro, syllabus, Nature of Science	ICA: Views of Nature of Science Questionnaire

Week	Topic	Readings, Activities, and Assignments
February 1	Science Notebooks and Nature of Science	R: McComas (1998). The principal elements of nature of science: Dispelling the myths. R: NCTE (2008). English Language Learners ICA: Using nature of science activities to promote the use of science notebooks
February 8	Preparing to teach science/Eliciting student ideas/Concept mapping	R: Campbell and Fulton Chapters 1-3 ICA: Exploring NSTA Science Formative Assessment Probes and Concept Mapping Activity
February 15	Washington's Birthday Recess	
February 22	Science Notebooks and Process skills	ICA: Use of science notebooks and Process Skills/Measurement/Metric System Activities
February 29	Teaching Science Through Inquiry	R: Campbell and Fulton Chapters 4 and 5 National research Council (2000). *Inquiry and the National Science Education Standards: A guide for teaching and learning*. Washington, DC: National Academy Press. Read Chapters 1, 2 and 3 http://books.nap.edu/catalog.php?record_id=9596 ICA: Lesson Plan Format Introduction and sample inquiry lessons
March 7	Next Generation Science Standards (NGSS)	ICA: Explore NGSS A: *Interview A Child for Ideas on a Science Concept assignment due*
March 14	Connecting Science with Other Subjects	R: Campbell and Fulton Chapter 6 Hayman, A., Hoppe, C. J., Deniz, H. (2012). Putting science literacy on display. *Science & Children, 50*(3), 58-62. ICA: Sample lessons integrating science with language arts
March 21	Spring Break	
March 28	Connecting Science with Other Subjects	ICA: Sample lessons integrating science with language arts

Week	Topic	Readings, Activities, and Assignments
April 4	Technology in Elementary Science Teaching	R: Deniz, H., & Dulger, M. (2012). Supporting fourth graders' ability to interpret graphs through real-time graphing technology: A preliminary study. *Journal of Science Education and Technology, 21*(6), 652-660 ICA: Sample science lessons supported with technology
April 11	Assessing Science Learning	R: National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press. Read Chapter 5 http://www.nap.edu/catalog.php?record_id=4962
April 16	Engineering in Elementary Science Classrooms	Monson, D., & Besser, D. (2015). Smashing milk cartoons. *Science & Children, 42*(9), 38-42. ICA: Sample elementary engineering design challenge
April 25	Lesson presentations	A*: Science Notebooks due*
May 2	Lesson presentations	A*: Lesson Plan(s) due*
May 9	Lesson presentations	A: Children's Book due

SPECIAL NOTES

Academic Misconduct

Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the *Student Academic Misconduct Policy* (approved December 9, 2005) located at: https://www.unlv.edu/studentconduct/student-conduct.

Copyright

The University requires all members of the University Community to familiarize themselves with and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal

liability, as well as disciplinary action under University policies. Additional information can be found at: http://www.unlv.edu/provost/copyright.

Disability Resource Center (DRC)
The UNLV Disability Resource Center (SSC-A 143, http://drc.unlv.edu/, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Religious Holidays Policy
Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor within the first 14 calendar days of the course for fall and spring courses (excepting modular courses), or within the first 7 calendar days of the course for summer and modular courses, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: http://catalog.unlv.edu/content.php?catoid=6&navoid=531.

Transparency in Learning and Teaching
The University encourages application of the transparency method of constructing assignments for student success. Please see these two links for further information:
https://www.unlv.edu/provost/teachingandlearning
https://www.unlv.edu/provost/transparency

Incomplete Grades
The grade of I—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

Tutoring and Coaching
The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit http://www.unlv.edu/asc or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

UNLV Writing Center
One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: http://writingcenter.unlv.edu/.

Rebelmail
By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. Emailing within WebCampus is acceptable.

Final Examinations
The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: http://www.unlv.edu/registrar/calendars.

Library Resource
Students may consult with a librarian on research needs. For this class, the Subject Librarian is (https://www.library.unlv.edu/contact/librarians_by_subject). UNLV Libraries provides resources to support students' access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at https://www.library.unlv.edu/.