Syllabus

SCED 3409: Foundations of Elementary Science II

Sul Ross State University

Summer 2024

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Office Location: Online

Office Hours: Online (Blackboard Collaborate)

M 12-1:30 PM, W 12-1:30 PM, or by appointment

Course Hours: Online (Blackboard Collaborate)

Lecture **M, Th 6:00-8:00 PM**

Lab **M, Th 3:00-5:59 PM**

COURSE PREREQUISITES:

None listed.

CATALOG COURSE DESCRIPTION:

SCED 3409
This is the Second in a series of two courses offered to education students, in which students will learn and explore the teaching of required science content outlined in the TEA science competencies related to Physical Sciences, toward their future roles as elementary and middle school science teachers. This course provides a broad introduction to Chemistry and Physics including: (1) Matter (2) State of Solid, Liquid, and Gas (3) Measurement of Physical and Chemical Properties (4) Periodic Table from Elements (5) Several Chemical Reactions (6) Electricity and Magnetism; (7) Temperature, heat and thermal properties of matter; (8) Optics; (9) Atomic Physics.
Inquiry and investigation are promoted in this class such that preservice teachers may do the same in their future science classrooms. The class emphasizes problem-solving as a pedagogical tool and explores assessment types and lesson plans appropriate to varied science content.

Equivalent courses: SCER 3409

TEXTS: No physical textbook required. Supplemental content and material will be available online from the following **Open resources as listed below…**

Resources for Elementary School Science:

• Online Science Texts:

CK-12 Earth Science for Middle School | CK-12 Foundation (ck12.org)

CK-12 Physical Science for Middle School | CK-12 Foundation (ck12.org)

CK-12 Interactive Physics for High School | CK-12 Foundation (ck12.org)

CK-12 Chemistry for High School | CK-12 Foundation (ck12.org)

Free Chemistry Textbook Available for Download - OpenStax

Middle School Chemistry - American Chemical Society (acs.org)

Simulation Links:

Physics Filter - PhET Simulations (colorado.edu)

Chemistry Filter - PhET Simulations (colorado.edu)

Physics Simulations at The Physics Classroom

• Online Quiz Game Software:

Kahoot

Blooket

Gimkit

• Online Presentation Software:

Canva: Visual Suite for Everyone

• Annenberg Media:

Science Archives - Annenberg Learner

• National Science Education Standards:

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

(download can also be found here (if it doesn't load, try to copy and paste the link into the browser): Foundations of Elementary Science)

• National Science Teachers Association:

http://www.nsta.org

• Project 2061:

http://www.project2061.org/

• Texas Education Agency:

Texas Administrative Code, Title 19, Part 2 | Texas Education Agency

• Science Generalist EC-6 Standards State of Texas (Teacher Competencies):

TEXAS EXAMINATIONS OF EDUCATOR STANDARDS (TExES) -COMPETENCIES:

Oral Language (texas.gov)

• AI Student Tutor

www.ck12.org

• Edutopia is likely to be used for submission of lesson plans, and other applications on the job as a teacher:

http://www.edutopia.org

• Videos for Educators:

http://www.teachertube.com

Texas Essential Knowledge and Skills (TEKS):

Texas Essential Knowledge and Skills - Wikipedia

(downloads of Elementary School Science TEKS and Middle School TEKS for Science will be posted to BlackBoard)

STAAR Exams:

State of Texas Assessments of Academic Readiness - Wikipedia

Old STAAR EXAM Questions:

STAAR Released Test Questions | Texas Education Agency

PROFESSOR EXPECTATIONS FROM STUDENTS:

Professor will provide weekly communication with the class via Blackboard Announcements, emails, and weekly class sessions.

Professor will respond to emails within 24 – 48 hours.

Clearly outlined assignments and expectations will be provided.

Assignments will be graded within 1 week of the submission date.

PROFESSOR EXPECTATIONS OF STUDENTS:

Students will respond to email requests from professor within 48 hours.

Students will attend class sessions on a weekly basis. Attendance will be taken.

STUDENT LEARNING OUTCOMES:

1. Students will demonstrate effective lesson planning.

2. Students will demonstrate written and oral proficiency through a variety of instructional strategies.

3. Students will demonstrate effective evaluative processes for assessing student learning

4. Students will become familiar with TExES Science Competencies covered on the Core Content examination.

5. Students will become familiar with Science TEKS.

COURSE OBJECTIVES:

1. Students will be able to distinguish science from pseudoscience and skeptically evaluate claims based on strength of evidence.

2. Students will refine personal teaching philosophy through studying theories and methodologies of elementary instruction and science pedagogy.

3. Students will demonstrate understanding of basic chemistry principles.

4. Students will demonstrate understanding of basic physics principles.

5. Students will utilize instructional strategies including planning, organizing, writing and implementing science lesson plans.

6. Students will demonstrate the teaching of science lessons.

MARKETABLE SKILLS:

1. Students have the ability to teach diverse learners in an inclusive learning environment.

2. Students have the ability to assess student learning.

3. Students have the ability to critically think and creatively adapt instructional strategies to an instructional setting.

4. Students have the ability to construct a classroom management plan.

5. Student have the ability to effectively use technology to communicate.

ATTENDANCE POLICY:

Students missing 20% of lectures may be dropped from class per SRSU catalog. Any student dropped for excessive absences will receive an F for the course grade. Please notify your instructor BEFORE missing class for authorized activities, death in the family, or illness. Assignments missed for any reason must be made up within one week of the originally scheduled date.

LECTURE COURTESY:

The general rules of classroom etiquette are below.

1. Please do not talk to others in class while the instructor is lecturing. If you have a question, ask the instructor.
2. Please turn cell phones to silent while in class.
3. While attending class online, please attend class as professionally as one would do in person (ie. Wearing proper clothes, not being disruptive or disrespectful to your peers, etc.)

DISTANT LEARNING STATEMENT:

Students enrolled in distance education courses have equal access to the university's academic support services, such as Smarthinking, library resources, such as online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login information to verify students' identities and to protect students'

information. The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website.

ACADEMIC INTEGRITY:

Students in this class are required to demonstrate scholarly behavior and academic honesty in the use of intellectual property. A scholar is expected to be timely, prepared, and focused. Meaningful, respectful, and pertinent online participation is also expected.

Examples of academic dishonesty include but are not limited to: submitting work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation.

SAFE ASSIGN:

The Safe Assignment Tool is an advanced plagiarism prevention system deeply integrated with the Blackboard Learning Management System. SafeAssignment compares student papers submitted to Blackboard against an enormous wide range of sources and provides instructors with detailed Originality Reports. Because of SafeAssignment's flexibility, this product is an effective plagiarism prevention system that helps instructors to raise student awareness about plagiarism and to educate students about the ways to avoid plagiarism. You can check your similarity report and make corrections if needed. With your similarity report, you will note highlighted areas that have similarity noted between your paper and another source. You will click on the tab within the colored square to see the percentage of the similarity. Percentages above 10% must be corrected. It does not matter if the source that is being noted for similarity is not the same source that you used. The system is telling you what you have written is too similar to another source and you need to make corrections. You may need to change up some of the wording or order of information to make it your information. More than three or four words in a row that are identical to the originating author can be detected. You can submit your paper as many times as you would like. This system is designed to assist students with increasing awareness of plagiarism. Typically, plagiarism is an accidental occurrence and occurs when students do not realize their writing is overly similar to another source.

SRSU DISABILITY SERVICES:

Sul Ross State University (SRSU) is committed to equal access in compliance with the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. The Disability Services Coordinator in Counseling and Student Support Services has the responsibility to ensure students with disabilities the

opportunity for full participation in programs, services, and activities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact SRSU's Accessibility Services Coordinator, Mary Scwartze Grisham, at 432-837-8203, or email counseling@sulross.edu. Our office is located on the first floor of Ferguson Hall (Suite 112), and our mailing address is P.O. Box C-122, Sul Ross State University, Alpine. Texas, 79832.

COURSE REQUIREMENTS:

TECHNOLOGY REQUIREMENTS:

Students are required to have their own computers and internet that can handle the required technology, including audio, a camera, Chrome, Blackboard, Zoom, YouTube, and other applications. Not having the technology at your disposal at any time is not an excuse for failure to submit an assignment, join a Teams or Blackboard session, or take an exam.

LIBRARY:

The Bryan Wildenthal Memorial Library in Alpine. Offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu. Off-campus access requires logging in with your LobolD and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or phone (432-837-8123).

ACADEMIC INTEGRITY:

Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. A scholar is expected to be punctual, prepared, and focused; meaningful and pertinent participation is appreciated. Examples of academic dishonesty include but are not limited to: Turning in work as original that was used in whole or part for another course and/or professor; turning in another person’s work as one’s own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden.

CLASSROOM CLIMATE OF RESPECT:

Importantly, this class will foster free expression, critical investigation, and open discussion of ideas. This means that all of us must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, we must all learn how to probe, oppose and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against another on the basis of race, religion, ethnicity, age, gender,

national origin, or sexual preference. Still, we will not be silenced by the difficulty of fruitfully discussing politically sensitive issues

EVALUATION:

The learner will be evaluated utilizing the following methods in order to ensure that the learning outcomes are being addressed: The learner will post a lesson plan over a Science lesson on Blackboard and will then present the lesson. Classmates will follow along with the lesson being taught. Discussion, feedback and reflection will take place after each lesson that is taught. Rubrics over the lesson plan and lesson presentation will be completed by the instructor.

GRADING POLICY:

Your grade for this course will be determined by evidence of the quality of your learning as demonstrated by your performance on the following:

COURSE REQUIREMENTS AND GRADING:

✓ Final Exam – 25%

✓ Lesson Plans – 25% (2 X 12.5% each)

✓ Presentations – 40% (2 X 20% each)

✓ Class Participation – 10%

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F = 59 and below

EXAMPLE OF TEKS:

§112.5. Science, Grade 3, Adopted 2021

(b) Knowledge and skills. (5) Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. The student is expected to: (C) use scale, proportion, and quantity to

describe, compare, or model different systems; (D) examine and model the parts of a system and their interdependence in the function of the system.

ASSIGNMENTS AND REQUIREMENTS

Exams: 25%

There will be a Final exam worth 25% of your total grade. The exam will consist of short answer and/or essay questions. You will have 2 hours to complete each exam.

Lesson Presentations: 40%

Students will independently work on presentations related to science and will present on the due date assigned. Lesson presentations will be graded utilizing a rubric. You will be required to post Lesson Plans, PowerPoint presentations, as well as handouts and materials needed to Discussion Board. Classmates not presenting will need to have necessary materials that are required to enact the lesson as well as complete the activity that is included in the lesson.

Lesson Plans: 25%

Students will be expected to type up lesson plans and turn in prior to presenting their lesson presentation. Lesson Plans will be posted to Blackboard and will be graded utilizing a rubric that will be shared with you.

Class Participation/Attendance: 10%

Students are expected to participate in class discussions and class activities. The format of the class will be lecture, discussion, group activities, and presentations. Failure to participate will result in a loss of points.

Why Lesson Plans are due on the day before the PowerPoint Presentation is due – I will be grading each assignment independently. So, I will utilize the rubric to grade the lesson plans before I ever see the Presentations. Then I will use the presentation rubric to grade the Presentation. Both rubrics are very similar, however Lesson Plans and Presentations are graded independently of each other.

TENTATIVE LECTURE SCHEDULE	
DATE	**LESSON TOPIC**
July 8	Introduction, Syllabus, Bloom's taxonomy for critical thinking
July 8	Scientific Method, Hypothesis Testing, In Science, what is a Hypothesis vs a Theory vs a Law?
July 11	Units of Measurement (SI Units) and Units Conversions
July 11	Significant Figures/Scientific Notation, Precision, Accuracy, and Error
July 15	Physics: Motion, Speed, Vectors, Velocity, Acceleration
July 15	Physics: Force
July 18	Physics: Momentum
July 18	Energy Transformation & Energy Conservation
July 22	Electricity and Magnetism

July 22	Thermal Physics
July 25	Optics
July 25	Harmonic Motion and Waves
July 29	Sound
July 29	Introduction to Matter, Composition of Matters Chemistry in context, Phases, Classification of Matter
August 1	Matter and Conservation of Matter; Mass vs Weight, Volume, Density
August 1	Matter: Solutions and Mixtures, and Conservation of Mass
August 5	What is an Atom? Electrons, Nucleus, Atomic Structure, Neutral Atoms, Mass Number (A), Atomic Number (Z); Protons, Neutrons, and Electrons; Ions, Cations & Anions, Chemical Symbols, Atomic Mass, Chemical Formulas
August 5	Overview of Periodic Table of Elements, and what the numbers mean? (Last lesson introduced Atoms and Subatomic Particles)
August 8	(Molecules and) Types of Chemical Bonds, Molecular & Ionic Compounds, Monoatomic (simple) ions, Polyatomic ions
August 8	Formula Mass, Moles, Avogadro's Number, Molar Mass
August 12	What is a Chemical Reaction? Common examples? Writing Chemical Equations, and Balancing Chemical Equations
August 12	pH, acids and bases, examples and color changes (pH indicators)
August 14	**Final Exam Due**

LESSON SIGN UP SHEET

TEXAS EXAMINATIONS OF EDUCATOR STANDARDS (TExES) -COMPETENCIES:

TExES SCIENCE STANDARDS:

This course will build mastery of the following Standards:

Science Standard I – The science teacher manages classroom, field, and laboratory activities to ensure the safety of all students and the ethical care and treatment of organisms and specimens.

Science Standard II – The science teacher understands the correct use of tools, materials, equipment and technologies.

Science Standard III – The science teacher understands the process of scientific inquiry and its role in science instruction.

Science Standard IV – The science teacher has theoretical and practical knowledge about teaching science and about how students learn science.

Science Standard V – The science teacher knows the varied and appropriate assessments and assessment practices to monitor science learning.

Standard Standard VI – The science teacher understands the history and nature of science.

Science Standard VIII – The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in physical science.

Standard XI – The science teacher knows unifying concepts and processes that are common to all sciences.