

# Foundations of Elementary Science II

## SCED/SCER 3409

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🕒 Appointments: Can be scheduled as needed

🏠 Office: Virtual/Remote by appointment

🖥️ Class: Virtual Through Blackboard T/Th 6:00pm



### Course Description

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 in the form of the TEA science competencies related to Life Science and Earth Science, toward their future roles as elementary and middle school science teachers. Topics covered will include the following TEA science competencies: History & Nature of Science; Impact of Science; Structure & Function of Earth Systems; Cycles in Earth Systems; Energy in Weather & Climate; Structure & Function of Living Things; Reproduction & the Mechanisms of Heredity; Relationship between Organisms & the Environment; Energy Transformations & Conservation of Matter; Impact of Science on Personal & Societal Decisions; and Students as Learners & Science Instruction. 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.

### Student Learning Objectives

- 1) Students will be able to distinguish science from pseudoscience and skeptically evaluate claims based on strength of evidence.
- 2) Students will describe the organization and functioning of living things, including the human body.
- 3) Students will refine personal teaching philosophy through studying theories and methodologies of elementary instruction and science pedagogy.
- 4) Students will demonstrate understanding of basic Biological principles such as ecology, evolution, taxonomy, and genetics.
- 5) Students will demonstrate understanding of basic Geological principles such as minerals, weather and climate, cycles, and processes (weathering and plate tectonics).

### Book



A Short History of Nearly Everything, Bill Bryson

<https://a.co/d/g5Ki2At>

ISBN-10 076790818X ISBN - 13 978-0767908184





## Course Grading

### Grading Scale

- A = 1000-900 points
- B = 899-800 points
- C = 799-700 points
- D = 699-600 points
- F = 599-0 points

## Assignments

- Bryson Book Reflection Questions 180 Total (6 Assignments, 30 pts each)
- Types of Science Investigations Analysis 30 points
- Science Scope Article Video Reflection 20 points
- Professional Development Research 50 points
- Class Observation 100 points
- Follow the Strand 50 points
- Exams (2) 200 Points Each
- Science Journal 50 points
- Attendance 60 points
- Participation 60 points



**Bryson Book Reflection** - There will be 6 assignments that will each cover 5 chapters of the book. You will reflect on what you read and answer the questions. *These 6 assignments are the only ones that will be due at 4pm the day of the book discussion.* You are also required to participate in class during the book discussion.

**Science Investigations Analysis** - You will create a document or thinking map summarizing the types of scientific investigations required by the TEKS.

**Article Discussion** - Students will record a video reflection after reading a specified article.

**Professional Development Research** - After reading the article, you will research available professional development for science teachers.

**Science Lesson Observation** - Students will be required to observe a science hands on activity in your local district and evaluate the lesson.

**Follow the Strand** - Analyze one strand of TEKS from K-6th grade

**Exams** - There will be 2 multiple choice assessments.

**Science Journal** - Keep a science journal throughout the semester using the provided pdf and a composition notebook. At the end of the semester you will turn in a video flipthrough of your journal.

**Attendance** - Camera must be turned on during class to earn credit for attendance that day.

**Participation** - Vocally or in chat.



Week

# Course Schedule



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Class Activity	Comp	Assignment Due
Jan 16	Class introduction	
Jan 21	Lab Safety, Tools	
Jan 23	Measurement	
Jan 28	Nature of Science	
Jan 30	Book Discussion	CH 1-5 Reflection Questions
Feb 4	Nature of Science Cont.	
Feb 6	Matter and Density	Science Scope Article Discussion
Feb 11	Physical/Chem Properties	
Feb 13	Book Discussion	CH 6-10 Reflection Questions
Feb 18	Periodic Table	
Feb 20	Atoms	Science Investigation Analysis
Feb 25	Compounds	
Feb 27	Book Discussion	CH 11-15 Reflection Questions
Mar 4	Mixtures and Solutions	
Mar 6	Exam	Prof. Development Research Due
Mar 11	Book Discussion	CH 16-20 Reflection Questions
Mar 13	Science Learners	Exam
Mar 18	SPRING BREAK	
Mar 20		
Mar 25	Energy, Heat Transfer	
Mar 27	Magnetism and Electricity	
Apr 1	Book Discussion	CH 21-25 Reflection Questions
Apr 3	Light Waves	
Apr 8	Force	Follow The Strand
Apr 10	Newton's Laws	
Apr 15	Book Discussion	CH 26-30 Reflection Questions
Apr 17	Work	
Apr 22	Speed	
Apr 24	Simple Machines	
Apr 29	Natural Resources	Journal Due
May 1	Exam	Exam, Science Lesson Observation Due
May 6		




Note – This outline is subject to change for reasons of course interest, time constraint, or instructor whim. Assignments will be administered on the dates given, unless material relevant for a given assignment has not been covered as yet. Under such cases, a due date may be moved a class period or two to aid in the clarity and understanding of the material.

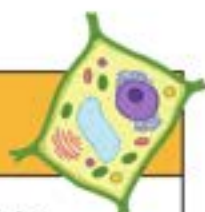

# Classroom Procedures & Expectations

## Academic Integrity

## Attendance



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. The use of artificial intelligence (AI) tools and applications (including ChatGPT, etc) to produce content for course assignments is a violation of academic integrity.



Students missing 20% of lectures may be dropped from the class per the 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. **REGARDLESS OF WHY AN ABSENCE OCCURS, YOU MAY BE GIVEN AN F FOR THE COURSE GRADE IF YOU ACCUMULATE SIX ABSENCES.** Attendance is part of your grade.

## Lecture Courtesy

## Classroom Climate of Respect



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, that is what I am here for.
- 2) Please turn cell phones to silent while in class. They are disruptive to the entire class, and detract from learning.
- 3) For remote connections, please attend class as professionally as one would do in person (ie. wearing proper clothes, not being disruptive or disrespectful to your peers, minimizing interruptions etc.)

Importantly, this class will foster free expression, critical investigation, and the 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.


## Marketable Skills

## ADA Statement

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1. Students are adaptable and flexible and communicate effectively.
  2. Students have the ability to teach diverse learners in an inclusive learning environment.
  3. Students have the ability to assess student learning.
  4. Students have the ability to effectively use technology.
  5. Students can use critical thinking and creative thinking in the workplace.
  6. Students are skilled in teamwork and conflict management
  7. Students have an ability to construct a classroom management plan.
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SRSU Accessibility Services. Sul Ross State University (SRSU) is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact Mrs. Mary Schwartze Grisham, LPC, SRSU's Accessibility Services Director or Ronnie Harris, LPC, Counselor, at 432-837-8203 or email [mschwartz@sulross.edu](mailto:mschwartz@sulross.edu) or [ronnie.harris@sulross.edu](mailto:ronnie.harris@sulross.edu). RGC students can also contact Alejandra Valdez, at 830-758-5006 or email [alejandra.valdez@sulross.edu](mailto:alejandra.valdez@sulross.edu). Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine, Texas, 79832.



# Classroom Procedures & Expectations cont.



Student Responsibility Statement	SRSU Distance Education Statement
<p>All full-time and part-time students are responsible for familiarizing themselves with the <u>Student Handbook</u> and the <u>Undergraduate &amp; Graduate Catalog</u> and for abiding by the <u>University rules and regulations</u>. Additionally, students are responsible for checking their Sul Ross email as an official form of communication from the university. Every student is expected to obey all federal, state and local laws and is expected to familiarize themselves with the requirements of such laws.</p> 	<p>Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, 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. 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. Directions for filing a student complaint are located in the student handbook.</p> 
Libraries	Supportive Statement
<p>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, <a href="http://library.sulross.edu">library.sulross.edu</a>. Off-campus access requires logging in with your LoboID and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (<a href="mailto:srsulibrary@sulross.edu">srsulibrary@sulross.edu</a>), or phone (432-837-8123).</p> 	<p>I aim to create a learning environment for my students that supports various perspectives and experiences. I understand that the recent pandemic, economic disparity, and health concerns, or even unexpected life events may impact the conditions necessary for you to succeed. My commitment is to be there for you and help you meet the learning objectives of this course. I do this to demonstrate my commitment to you and to the mission of Sul Ross State University to create a supportive environment and care for the whole student as part of the Sul Ross Familia. If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. I want to be a resource for you.</p> 

**"Equipped with his five senses, man explores the universe around him and calls the adventure Science." - Edwin Hubble**

## Standards Breakdown

1. Lab Processes, Equipment, and Safety - Includes lab safety, gathering data, and measurement systems
2. History and Nature of Science - Includes observations, scientific equipment, and the development of science over time
3. Impact of Science - Includes fitness and health, populations and population growth, and the effect of science on global processes
4. Concepts and Processes - Includes evidence, models, data patterns, and organization across scientific disciplines
5. Students as Learners and Science Instruction - Includes curriculum, hands-on learning experiences, and age-appropriate instruction
6. Science Assessment - Includes appropriate assessments of students' understanding
7. Forces and Motion - Includes universal forces, changes in motion, and the relationship between the two
8. Physical and Chemical Properties - Includes properties of solids, liquids, and gases, as well as physical and chemical changes in all three
9. Energy and Interactions - Includes energy transformation, heat, light, and sound
10. Energy Transformations and Conservation - Includes electrical energy, photosynthesis, and conservation of matter
11. Structure of Function of Living Things - Includes life cycles, structure of organisms, and human body systems
12. Reproduction and the Mechanisms of Heredity - Includes plant and animal reproduction, dominant and recessive traits, and genes
13. Adaptations and Evolution - Includes survival of certain species, mutation, and selective breeding
14. Organisms and the Environment - Includes internal and external stimuli, competition among species, and ecosystems
15. Structure and Function of Earth Systems - Includes plate tectonics, the atmosphere, and gradual and catastrophic changes to Earth systems
16. Cycles in Earth Systems - Includes the rock cycle, the water cycle, and the nutrient cycle
17. Energy in Weather and Climate - Includes elements of weather, energy transfers, and weather predictions and charts
18. Solar System and the Universe - Includes the Earth-Moon-Sun system and the solar system

