



**UNIVERSITY OF TEXAS  
EL PASO**

College of Education- Department of Teacher Education

<p>Title of Course: ELED/BED 4311, CRN 24841/27342  <b>Teaching Science in Elementary Classrooms</b>  <b>Teaching Science in Bilingual Elementary Classrooms</b></p>	<p style="text-align: center;">Instructor Information</p> <p>Name: Pei-Ling Hsu          Email: <a href="mailto:phsu3@utep.edu">phsu3@utep.edu</a>          Website: <a href="http://peilinghsu.utep.edu">http://peilinghsu.utep.edu</a>          Office: 813, Education Building          Office hours: 2:30-5:30pm, Tuesdays, by appointments</p>
Semester: 2023 Spring, Hybrid	
Day/Time: Tuesdays, 5:30-8:20pm	
Credits: 3	
Class hours: 3 hours/week	
Classroom: Room 405, Education Building	

**Course Description:**

This course discusses various methods and strategies for teaching science in elementary schools. Designing and implementing inquiry-based curriculum and activities are at the core of this course. The emphasis is on inquiry and standards-based teaching and learning. Students are provided with opportunities to learn, evaluate, design, and implement inquiry-based lessons through integrating theoretical and practical perspectives.

**Course Introduction**

This course draws on theoretical and practical perspectives to examine various instructional methods and resources to teach inquiry-based science in intermediate and middle grades. In the theoretical part, learning theories and research-based practice are presented and discussed. To apply the theoretical knowledge, students are provided with opportunities to examine, design and implement lesson plans that correspond to Texas Essential Knowledge and Skills (TEKS) in a collaborative and supportive environment. In the practical part, students have opportunities to interact with middle school students to gain situated experiences in teaching science. The mechanism and integration of theoretical and practical perspectives in this course allow students to experience a process that can serve as a lifelong learning model to help their professional development in their science teaching careers. This course is designed to help pre-service teachers to achieve the Texas Examinations of Educator Standards (TExES) as indicated in the followings:

- 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
- Science standard XI: The science teacher knows unifying concepts and processes that are common to all sciences.

**Test Framework (Generalist 4-8) – Domain IV**

The course is designed to help students to become competent science teachers who can provide the best learning opportunities for their students. At the end of the course, successful students will develop the

following competences:

- 1) Competency 036: The teacher understands how to manage learning activities to ensure the safety of all students
- 2) Competency 037: The teacher understands the correct use of tools, materials, equipment, and technologies
- 3) Competency 038: The teacher understands the process of scientific inquiry and the history and nature of science
- 4) Competency 056: The teacher has theoretical and practical knowledge about teaching science and about how students learn science
- 5) Competency 057: The teacher understands the process of scientific inquiry and its role in science instruction
- 6) Competency 058: The teacher knows the varied and appropriate assessments and assessment practices to monitor science learning in laboratory, field, and classroom settings

**UTEP EDGE Alignments:**

This course will help students gain experience of (1) learning communities, (2) creative activity, (3) community engagement, and (4) student leadership and help students enhance skills of (1) leadership, (2) problem-solving, (3) communication, (4), and (5) critical thinking.

**Student Learning Outcomes:**

Students will be able to:	Measurements/Assignments:
1. Identify and evaluate various resources to support teaching	(1) Discussion Board Posts, (2) Discussion Board Responses, (3) Resource Exploration 1, (4) Resource Exploration 2
2. Understand science content concepts associated with the applicable TEKS	(1) Discussion Board Posts, (2) Discussion Board Responses, (3) Resource Exploration 1, (4) Resource Exploration 2
3. Understand and implement standards for science excellence (TEXES, National Science Education Standards)	(1) Discussion Board Posts, (2) Discussion Board Responses, (3) Lesson Plan Draft 1 (4) Lesson Plan Draft 2, (5) Lesson Plan-Final
4. Appreciate and learn from theoretical and practical perspectives	(1) Discussion Board Posts, (2) Discussion Board Responses
5. Design and implement a quality scientific inquiry curriculum	(1) Lesson Plan Draft 1 (2) Lesson Plan Draft 2, (3) Lesson Plan-Final
6. Develop the ability to assist students in designing investigations using scientific inquiry	(1) Lesson Plan Draft 1 (2) Lesson Plan Draft 2, (3) Lesson Plan-Final
7. Evaluate the quality of lesson plans	(1) Merit presentation, (2) Critique presentation
8. Collaborate with other teachers to create the best learning opportunities for their students	(1) Lesson Plan Draft 1 (2) Lesson Plan Draft 2, (3) Lesson Plan-Final
9. Monitor one’s learning and identify ways for improvements	(1) Self- and Peer-Assessments, (2) Science Teaching Philosophy

**COVID-19 Precautions:**

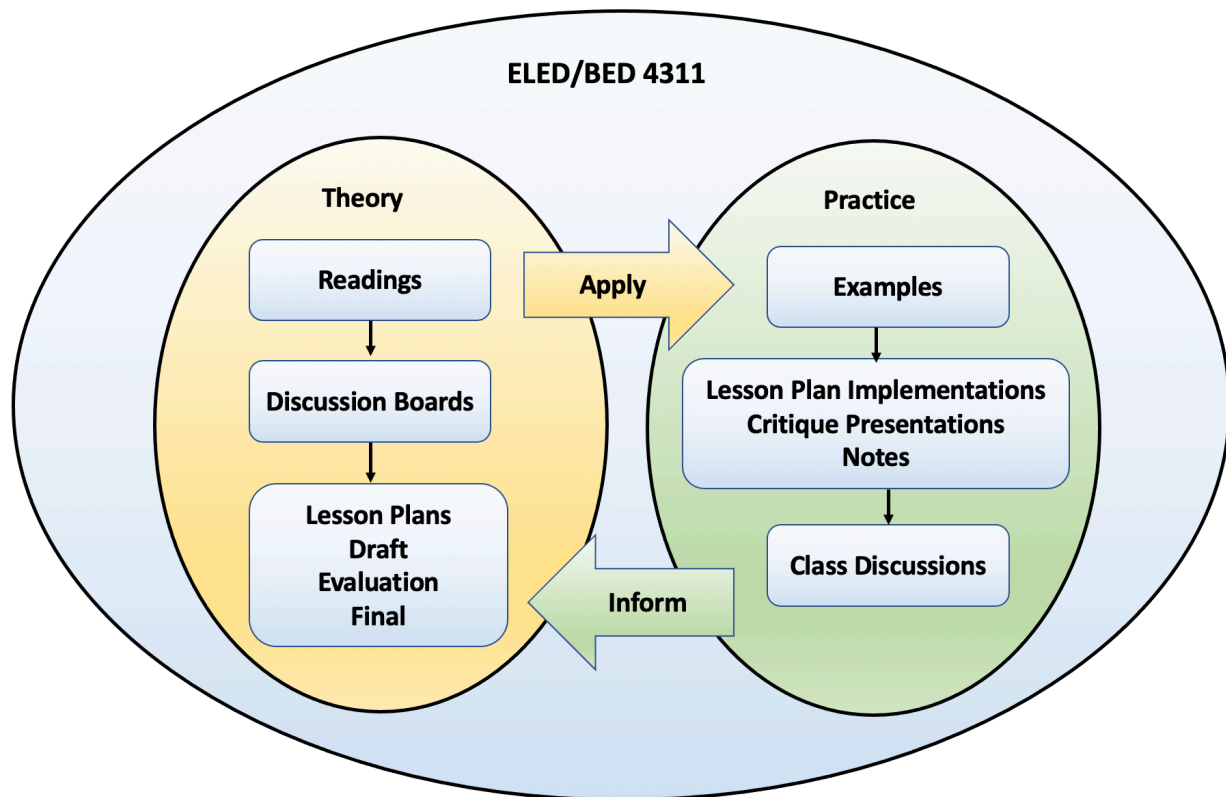
Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to [covidaction@utep.edu](mailto:covidaction@utep.edu), so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID 19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit [epstrong.org](http://epstrong.org)

### Learning Modules:

This course is designed using a modular format—that is, each week is “packaged” as a single module so that all the materials, lecture notes, submission areas, discussion posts are in one area for a given week.

### Course Overview Representation:



### Reading Packets:

#### 1) Reading Packet 1 (TEKS & NGSS standards):

- 1-1: Texas Essential Knowledge and Skills (TEKS): <http://www.tea.state.tx.us/index2.aspx?id=6148>
- 1-2: Next Generation Science Standards (NGSS): <https://www.nextgenscience.org/>

#### 2) Reading Packet 2 (Concept Map):

- 2-1: Vanies, J., Miki, Y-Y., & Ruiz-Primo. M. A. (2005). Using concept maps in the science classroom. *Science Scope*, 28(8), 27–31.
- 2-2: Llewellyn, D. (2007). Making the most of concept maps. *Science Scope*, 30(5), 74–77.

#### 3) Reading Packet 3 (Science Inquiry):

- 3-1: Banchi, H., & Bell, R. (2008). The many levels of inquiry. *Science and Children*, 46(2), 26–29.
- 3-2: Day, M., Stobaugh, R., Tassell, J., Neiman, N. (2012). Creating science assessments that support science that inquiry. *Science Scope*, 35(8), 54–59.

**4) Reading Packet 4 (5 E Model):**

- 4-1: Ansberry, K., & Morgan, E. (2010). *Picture-perfect science lessons*. National Science Teachers Association. (Chapter 4: BSCS 5E Instructional Model)
- 4-2: McFadden, J., Thornburgh, W., Robinson, B. (2021). 5E and the Pes: The popular instructional model can help meet multiple performance expectations. *Science and Children*, 59(1), 37–41

**5) Reading Packet 5 (Representations):**

- 5-1: Hsu, P.-L. (2016). Use multiple representations to teach science. *Science Scope*, 40(2), 52–59.
- 5-2: Olson, J. K. (2008). Methods & Strategies: The science representation continuum. *Science and Children*, 46(1), 52–55.

**6) Reading Packet 6 (Science Trade Books):**

- 6-1: Forsythe, M. Jackson, J., & Contreras, L. (2018). Hiding in plain sight: How to identify and use trade books to support the 5E instructional model. *Science & Children*, 56(2), 80–87.
- 6-2: Rice, D. C. (2002). Using trade books in teaching elementary science: Facts and fallacies. *The Reading Teacher*, 55(6), 552–565.

\* Additional handouts will be made available in classes. These documents play key roles in guiding your assignments and projects. Changes may be made in classes. Please make sure you read these documents in time.

**Technology Requirements:**

Course content is delivered partly via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have access to a computer/laptop. You will need to download or update the following software: Microsoft Office, Adobe Acrobat Reader, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course. If you do not have a word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP’s Microsoft Office Portal.

**IMPORTANT:** If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP Help Desk (Library Room 300, 915-747-4357, helpdesk@utep.edu) as they are trained specifically in assisting with technological needs of students. Please do not contact me for this type of assistance. The Help Desk is much better equipped than I am to assist you!

**Netiquette:**

According to [Handbook of Operating Procedures](#), no person shall make, distribute, or display on the campus any statement that constitutes verbal harassment of any other person:

“2.2.4.1.2 Verbal harassment may consist of threats, insults, epithets, ridicule, personal attacks, or the categories of harassing sexual speech set forth in Section VI: Equal Opportunity of this Handbook and is often based on the victim's appearance, personal characteristics, or group membership, including but not limited to race, color, religion,

national origin, gender, age, disability, citizenship, veteran status, sexual orientation, ideology, political views, or political affiliation.”

As we know, sometimes communication online can be challenging. It’s possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider audience. This is a college-level course; therefore, all communication should reflect polite consideration of other’s ideas.
- Respect and courtesy must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else’s message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.

### **Standards of academic integrity:**

Students are expected to uphold the highest standards of academic integrity. Any form of scholastic dishonesty is an affront to the pursuit of knowledge and jeopardizes the quality of the degree awarded to all graduates of UTEP. Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to: cheating, plagiarism, collusion [making plans to cheat with another], the submission for credit of any work or materials that are not attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the Handbook of Operating Procedures (HOP) and available in the Office of the Dean of Students, may result in sanctions ranging from disciplinary probation, to failing grades on the work in question, to failing grades in the course, to suspension or dismissal among others.

### **Students with Disabilities statement:**

If you have or believe you have a disability; you may wish to self-identify. You can do so by providing documentation to the Center for Accommodations and Support Services (CASS) located in Union E Room 106. Students who have been designated as having a disability must reactivate their standing with CASS on a yearly basis. Failure to report to this office will place a student on the inactive list and nullify benefits received. If you have a condition which may affect your ability to exit safely from the premises in an emergency or which may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the director of CASS. You may call 919-747-5148 or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at <https://www.utep.edu/student-affairs/cass/>.

### **Student Conduct and Discipline:**

All students are expected and required to obey the law and to comply with Regent, Rules, and Regulations (<http://www.utsystem.edu/bor/rules>) with system and University rules, with directives issued by an administrative official in the course of his or her authorized duties and to observe the standards of conduct appropriate for the university.

### **Equal Opportunity:**

All students regardless of gender, age, class, race, religion, physical disability, sexual orientation, etc., shall have equal opportunity without harassment in this course. Any problems with or questions related to this can be discussed confidentially with the instructor.

### **Excused Absences and Course Drop Policy:**

According to UTEP Curriculum and Classroom Policies, “When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with a grade of “W” before the course drop deadline and with a grade of “F” after the course drop deadline.” See academic regulations in the UTEP Undergraduate Catalog for a list of excuse absences. Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will drop you from the course. I will provide 24 hours advance notice via email.

### **Evaluation & Coursework Requirements of Students:**

All assignments should be submitted to Blackboard and all due dates are listed in Table 1.

#### **1. Discussion Boards Posts #1-#6 (24 points, 4 points for each post)**

For each Discussion Board Post (DBP), each student should post a minimum of 300 words on corresponding topics specified in Blackboard. Each of the post should include (1) summary of the reading/video packet, (2) personal connection to the reading/video packet, (3) concerns and questions for the reading/video packet. The titles for each DB post should indicate student name and DB number: “Pei-Ling Hsu – DB#1,” “Pei-Ling Hsu – DB#2,” etc. The rubric for this assignment can be found in Appendix 1.

#### **2. Discussion Boards Responses #1-#6 (12 points, 1 point for each response)**

For each Discussion Board Response (DBR), each student should respond to at least 2 other classmates’ DBP (each week choose different classmates). Each response should: (1) identify merits, (2) suggest ideas for improvements, and (3) end the response with a question. The minimum of each response is 100 words. The rubric for this assignment can be found in Appendix 2. A record of these responses will be posted and updated in Blackboard. Students should check the record regularly and let the instructor know immediately if there is any question about the updated response record.

#### **3. Resource Exploration (8 points, 4 points for each exploration)**

Each student will examine two website resources and identify and learn from high quality resources. Students are provided with “Template 1-Resource Exploration 1 (Minimum: 500 words)” and “Template 2-Resource Exploration 2 (Minimum: 500 words)” to fill out, including three components: (1) Resource introduction, (2) Merits of this resource, and (3) Ways to use this resource in teaching. This assignment should be submitted to the corresponding assignment section through the BLACKBOARD system in time. The rubric for this assignment can be found in Appendix 3.

#### **4. Science Trade Book (4 points)**

Each student will examine science trade books and present one high quality science trade book with the class. Students are provided with “Template 3-Science Trade Book (Minimum: 500 words)” to fill out, including three components: (1) Science Trade Book introduction, (2) Merits of this science trade book, and (3) Possible ways to use this science trade book. This assignment should be submitted to the corresponding assignment section through the BLACKBOARD system in time. The rubric for this assignment can be found in Appendix 4.

#### **5. Group Work on Lesson Plan (26 points)**

##### **(1) Lesson Plan Draft 1 (4 points):**

Students work as a group to design a lesson plan draft for their lesson plan. Students are provided with “Template 4-Lesson Plan Draft 1 (Minimum: 1000 words)” to fill out. The lesson plan draft should be submitted to the corresponding assignment section through the Blackboard system AND B-email the draft to the whole class. The rubric for this assignment can be found in Appendix 5.

##### **(2) Lesson Plan Draft 2 (4 points):**

Students work as a group to complete a lesson plan. Students are provided with “Template 6-Lesson Plan Draft 2 (Minimum: 1500 words)” to fill out. The lesson plan should be submitted to the corresponding assignment section through the Blackboard system AND B-email the lesson plan to the whole class. The rubric for this assignment can be found in Appendix 5.

**(3) Lesson Plan Presentation (8 points):**

Students work as a group to present their lesson plan. A powerpoint file should be submitted to the corresponding assignment section through the BLACKBOARD system and a paper-copy (3 slides per page) of this powerpoint file should be handed in to the instructor before the class on their presentation day. The guidance for evaluating lesson plans and the rubric for this assignment can be found in Appendix 6 and Appendix 7.

**(4) Critique Presentation (6 points):**

Students work as a group to evaluate a lesson plan designed by other groups and present at least 5 merits and 5 weaknesses and suggestions for improvements. A powerpoint file should be submitted to the corresponding assignment section through the BLACKBOARD system and a paper-copy (3 slides per page) of this powerpoint file should be handed in to the instructor before the class on their presentation day. The guidance for evaluating lesson plans and the rubric for this assignment can be found in Appendix 6 and Appendix 8.

**(5) Lesson Plan – Final (4 points):**

Students work as a group to revise their lesson plans according to the feedback they received from the class. Students are provided with “Template 9-Lesson Plan-Final (Minimum: 2000 words)” to fill out. The improved lesson plan should be submitted to the corresponding assignment section through the BLACKBOARD system in time. The rubric for this assignment can be found in Appendix 5.

**6. Two Written Reviews on Lesson Plans (8 points):**

Each student will review two other groups’ lesson plans and will provide feedback for improvements. Students are provided with “Template 5-Written review (Minimum: 500 words for each review)” to fill out. Each written review may include but not limit to (1) praise for merits, (2) identifications of weakness, and (3) ideas and suggestions for improvements. The written review should be submitted to the corresponding assignment section through the Blackboard system AND B-email the written review to the whole class. The rubric for this assignment can be found in Appendix 9.

**7. Science Teaching Philosophy (6 points)**

Students will reflect on their science learning experience and teaching philosophy. Students are provided with “Template 7-Science Teaching Philosophy (Minimum: 500 words)” to fill out, including three components: (1) Autobiography as a Science Learner, (2) Science Teaching Philosophy Statement, and (3) My Science Teaching Philosophy Picture. This assignment should be submitted to the corresponding assignment section through the BLACKBOARD system in time. The rubric for this assignment can be found in Appendix 10.

**8. Self- and Peer- Assessments on Group Work (4 points)**

Students will have opportunities to evaluate self and peer about their collaboration work. Students are invited to create their own criteria to evaluate themselves. Students are provided with “Template 8-Self and Peer Assessments” to fill out.

**9. Class Attendance and Participation (8 points)**

Each week, we have different readings and topics for discussions. Students should be prepared and are expected to participate in the classes actively. Students are expected to attend classes on time, finish assignments, and participate in the course professionally. *Students who have more than two absences may be dropped with an “F” (Fail).* Students who can find help from classmates to set up a virtual

conference with the class will be counted as present. Students missing a class are responsible for finding help to catch up with the course, complete any exercises, readings, activities, etc.

\*Bonus point (1 point): At the end of the semester, students will receive a UTEP email inviting students to submit a course evaluation. Once students complete the evaluation, students will receive a completion confirmation message. To encourage students to complete the course evaluation for this course, students may receive a bonus point by submitting their course evaluation “completion confirmation screenshots” (“NOT” the evaluation results) to show that they complete their course evaluation.

### **Course Requirements:**

1. All assignments should be submitted through the Blackboard system and use WORD files or Powerpoint files. File names should start with “your name” and end with “the assignment name”. There should be no space in between. Taking the name of “Isaac Newton” for example.
  - 1) IsaacNewton-ResourceExploration1.docx
  - 2) IsaacNewton-ResourceExploration2.docx
  - 3) IsaacNewton-ScienceTradeBook.docx
  - 4) Group1-LessonPlanDraft1.docx
  - 5) Group1-LessonPlanDraft2.docx
  - 6) Group1-LessonPlanPresentation.ppt
  - 7) Group1-CritiquePresentation.ppt
  - 8) Group1-LessonPlan-Final.docx
  - 9) IsaacNewton-TwoWrittenReviewsOnLessonPlans.docx
  - 10) IsaacNewton-ScienceTeachingPhilosophy.docx
  - 11) IsaacNewton-Self-andPeer-AssessmentsOnGroupWork.docx
2. Due dates are specified in Table 1 and due time is *11:59PM (midnight)* for ALL electronic submissions. Delayed submissions of any assignments will cause grade reductions. One delay day causes 10% reduction of a deserved grade, two delay days causes 20% of a deserved grade, and so on.
3. Each electronic file of assignments should not exceed 10 MB.
4. Students are encouraged to take notes during the course for creating your own learning resources.

### **Grade for STEM 6319:**

A letter grade will be assigned based on students’ performance: A (90–100 points), B (80–89 points), C (70–79 points), D (60–69 points), or F (<60 points).

### **Course Resources:**

- Concept map tool: <https://bubbl.us/>
- Learning Science Through Inquiry (Annenberg Learner): <http://www.learner.org/workshops/inquiry/about/overview.html>
- Web-based Inquiry Science Environment: <https://wise.berkeley.edu/>
- National Science Education Standards (NSES): [http://www.nap.edu/openbook.php?record\\_id=4962](http://www.nap.edu/openbook.php?record_id=4962)
- Texas Education Agency (TEA): <http://www.tea.state.tx.us/index.aspx>
  - Texas Essential Knowledge and Skills (TEKS): <http://www.tea.state.tx.us/index2.aspx?id=6148>
  - Texas Assessment of Knowledge and Skills (TAKS): [http://www.tea.state.tx.us/index3.aspx?id=3839&menu\\_id=793](http://www.tea.state.tx.us/index3.aspx?id=3839&menu_id=793)
  - State Board for Educator Certification (SBEC): <http://www.tea.state.tx.us/index2.aspx?id=2147489433>
  - Texas Examinations of Educator Standards (TExES): <http://www.texas.ets.org/texas/>



- TExES Preparation Manuals: <http://www.texas.ets.org/texas/prepMaterials/>
- Pedagogy and Professional Responsibilities (PPR) Standards: [http://www.tea.state.tx.us/index2.aspx?id=5938&menu\\_id=2147483671&menu\\_id2=794](http://www.tea.state.tx.us/index2.aspx?id=5938&menu_id=2147483671&menu_id2=794)
- English Language Proficiency (ELP) Standards: [http://www.tea.state.tx.us/index2.aspx?id=5938&menu\\_id=2147483671&menu\\_id2=794](http://www.tea.state.tx.us/index2.aspx?id=5938&menu_id=2147483671&menu_id2=794)
- Texas Gateway: <https://www.texasgateway.org/>

### **UTEP Resources:**

- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.
- [Military Student Success Center](#): Assists personnel in any branch of service to reach their educational goals.
- [Center for Accommodations and Support Services](#): Assists students with ADA-related accommodations for coursework, housing, and internships.
- [Counseling and Psychological Services](#): Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.
- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [History Tutoring Center \(HTC\)](#): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

Class Schedule (Table 1)

Changes may be made during the classes. Students should follow the latest changes.

No	Date	Topic	Reading before the Class	Assignments Due (11:59pm) I: Individual work; G: Group work
01	Jan 17 (F2F)	Syllabus & Blackboard & Grouping	Syllabus	
02	Jan 24	TEKS & NGSS	Reading Packet 1	I: Syllabus test (Jan 23) I: DB#1-Post-TEKS & NGSS (Jan 20) I: DB#1-Responses-TEKS & NGSS (Jan 23)
03	Jan 31 (F2F)	TEKS & NGSS	Reading Packet 1	I: DB#2-Post-Concept Map (Jan 27) I: DB#2-Responses-Concept Map (Jan 30)
04	Feb 7	Concept maps	Reading Packet 2	I: DB#3-Post-Science Inquiry (Feb 3) I: DB#3-Responses-Science Inquiry (Feb 6)
05	Feb 14 (F2F)	Science Inquiry and 5 E Model	Reading Packet 3	I: DB#4-Post-5E Model (Feb 10) I: DB#4-Responses-5E Model (Feb 13)
06	Feb 21	Science Inquiry and 5 E Model	Reading Packet 4	I: DB#5-Post-Representations (Feb 17) I: DB#5-Responses-Representations (Feb 20)
07	Feb 28 (F2F)	Representation-Part 1	Reading Packet 5	I: Resource Exploration 1 (Template 1) (Feb 27)
08	Mar 7	Resource Exploration		I: Resource Exploration 2 (Template 2) (Mar 6)
09	Mar 14	Spring break		
10	Mar 21 (F2F)	Representation-Part 2	Reading Packet 5	G: Lesson Plan Draft 1 (Template 4, B-Email to everyone) (Mar 20)
11	Mar 28	Lesson Plan		I: Two Written Reviews (Template 5, B-Email to everyone) (Mar 27)
12	Apr 4 (F2F)	Teaching science through Trade Books	Reading Packet 6	I: DB#6-Post-Trade Books (Mar 31) I: DB#6-Responses- Trade Books (Apr 3) I: Science Trade book (Template 3) (Apr 3)
13	Apr 11	Lesson Plan	Reading Packet 1-6	G: Lesson Plan Draft 2 (Template 6, B-Email to everyone) (Apr 10)
14	Apr 18 (F2F)	Lesson Plan presentations (Group 1, 2, 3) Critique presentations (Group 4, 5, 6)	Reading Packet 1-6	G: Lesson Plan Powerpoint (only Group 1, 2, 3) (Apr 17) G: Critique Powerpoint (only Group 4, 5, 6) (Apr 17)
15	Apr 25 (F2F)	Lesson Plan presentations (Group 4, 5, 6) Critique presentations (Group 1, 2, 3)	Reading Packet 1-6	G: Lesson Plan Powerpoint (only Group 4, 5, 6) (Apr 24) G: Critique Powerpoint (only Group 1, 2, 3) (Apr 24)
16	May 2	Reflective assignments		I: Science Teaching Philosophy (Template 7) (May 1) I: Self-and Peer-Assessments (Template 7) (May 1) G: Lesson Plan-Final (Template 9) (May 1) I: UTEP online course evaluation (May 1)

Appendixes:

**Appendix 1: Grading Rubric for “Discussion Board Post #1-#6”**

	<b>Excellent 67-100%</b>	<b>Satisfactory 34-66%</b>	<b>Underperform 0-33%</b>
Follow instructions to cover required content	For each DBP, each student should post a minimum of 300 words on corresponding topics specified in Blackboard. Each of the post should include (1) summary of the reading packet, (2) personal connection to the reading packet, (3) concerns and questions for the reading packet. The titles for each DB post should indicate student name and DB number: “Pei-Ling Hsu – DB#1,” “Pei-Ling Hsu – DB#2,” etc.	DBP covers most of the requirements.	DBP covers only a few requirements.
Writing Skill	Sentences are clear and wording is unambiguous. Correct word choice, correct spelling, correct grammar, and APA 7 format. Writing style can still be conversational rather than formal. The writing does not have to be flawless, but it will be better than average writing.	Ordinary, good writing. Lapses are regular and patterned, but do not undermine the communication or the persuasiveness of the argument.	Grammar, spelling, and/or word choice errors are frequent enough that the sense of the message is lost or muddled.

**Appendix 2: Grading Rubric for “Discussion Board Response #1-#6”**

	<b>Excellent 67-100%</b>	<b>Satisfactory 34-66%</b>	<b>Underperform 0-33%</b>
For each Discussion Board Response (DBR), each student should respond to at least 2 other classmates’ DBP (each week choose different classmates). Each response should: (1) identify merits, (2) suggest ideas for improvements, and (3) end the response with a question. The minimum of each response is 100 words.		DBR covers most of the requirements.	DBR covers only a few requirements.

**Appendix 3: Grading Rubric for “Resource Exploration”**

	<b>Excellent 67-100%</b>	<b>Satisfactory 34-66%</b>	<b>Underperform 0-33%</b>
For each resource exploration, each student should identify a high quality teaching resource and fill out “ <u>Template 1-Resource Exploration</u> ”, including three components: (1) Resource introduction, (2) Merits of this resource, and (3) Ways to use this resource in my future teaching. The minimum words for each resource exploration is 500 words.		The assignment covers most of the requirements.	The assignment covers only a few requirements.

**Appendix 4: Grading Rubric for “Science Trade Book”**

	<b>Excellent 67-100%</b>	<b>Satisfactory 34-66%</b>	<b>Underperform 0-33%</b>
Each student will examine science trade books and present one high quality science trade book with the class. Students are provided with “ <u>Template 3-Science Trade Book (Minimum: 500 words)</u> ” to fill out, including three components: (1) Science Trade Book introduction, (2) Merits of this science trade book, and (3) Possible ways to use this science trade book.		The assignment covers most of the requirements.	The assignment covers only a few requirements.

**Appendix 5: Grading Rubric for “Lesson Plan- Draft 1, Draft 2, and Final”**

	<b>Excellent 67-100%</b>	<b>Satisfactory 34-66%</b>	<b>Underperform 0-33%</b>
1. Lesson Title	-The title is intriguing, succinct and represents the lesson plan	-The title is intriguing and represents the lesson plan	-The title is intriguing but does not represent the lesson plan
2. Grade	-The lesson plan is suitable for the grade identified	-There are some concerns of the use of the lesson plan for this grade	-The lesson plan is not suitable for the grade identified
3. Time	-Time is appropriate	-Time is some what inappropriate	-Time is not described or inappropriate
4. Learning objectives	-Concise descriptions of what learners are expected and able to do by the end of the lesson - Objective statements include a variety of actions verbs (concrete and explicit) that address different cognitive levels. - There is evidence in the assessment section that students’ learning is linked to the concepts and skills addressed in the learning objectives.	- Descriptions of what learners are expected to learn are general. -Most action verbs in the objective statements are from either lower or higher order thinking levels that do not address different cognitive levels. -Fail to show connection with the assessment section.	-The description of the learning objectives is vague. -Action verbs in the objective statements do not support meaningful learning.
5. TEKS alignment	-Listed standards reflect the grade level, concepts and skills of the lesson plan. -There is evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.	-Listed standards reflect the grade level and the concepts of the lesson plan. -Partial evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.	-Lesson is loosely connected to the standards.
6. NGSS Alignment	-Listed standards reflect the grade level, concepts and skills learned in the project -There is evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.	-Listed standards reflect the grade level and the concepts -Partial evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.	-Project is loosely connected to the standards.
7. Materials	-Names and pictures for materials are accurately listed -Required tools and resources are listed. -Reference in procedures are clearly defined as to they are to be utilized	-Names and pictures are listed -Most of the required resources and materials are listed. -Some reference are unclear definition in procedures.	-No names or pictures are accurately listed -Some citing of resources through the lessons; materials listed but not included in the procedures.
8. Safety considerations	-Safety concerns are discussed; suggestions or solutions for addressing these safety concerns are provided	-Safety concerns are discussed	-Safety concerns are not discussed
9. Scientific Topics	-Topics show sequence and progression. -The descriptions of these topics are fully introduced -Opportunities are provided for students to link daily work to past and upcoming content/skills.	-Topics show somewhat sequence and progression. -The descriptions of these topics are provided -Opportunities are provided for students to link daily work to past and upcoming content/skills.	-Topics does not consider the proper sequence and progression -No descriptions of these topics are provided -No relevant connections to students’ daily life
10. Concept map	-provide concept map that accurately present the relationship of scientific concepts involved in this lesson plan -provide concepts and linking words	-provide concept map that somewhat present the relationship of scientific concepts involved in this lesson plan -only provide concepts or linking words	-provide concept map that does not accurately present the relationship of scientific concepts involved in this lesson plan
11. Possible Misconceptions about These	-List all possible misconceptions about the scientific topics involved	-Only list part of the possible misconceptions about the scientific topics involved	-Only list a few possible misconceptions about the scientific topics involved

Scientific Topics			
12. Inquiry skills	-List all inquiry skills students will learn and practice in the lesson plan	-Only list part of the inquiry skills involved in the lesson plan	-Only list a few inquiry skills involved in the lesson plan
13. Detailed Description of 5E model Teaching and Learning Practice	<ul style="list-style-type: none"> <li>-Lessons include activities to “hook” the student into the day’s lesson, and are engaging and relevant.</li> <li>-The cited activity relates to the lesson objectives, and organizes principles or information that is to follow.</li> <li>-Lesson/s includes a variety of opening activities.</li> <li>-The lesson plan uses 5 E Models in which the teacher will employ strategies (i.e., lecture, film, pictures) to provide the information needed for students to gain knowledge or skills.</li> <li>-The lesson plan describes the activities the students will practice to demonstrate their mastery of the new learning (concepts/skills).</li> <li>-The lesson plan informs the level of mastery the teacher will determine as she/he walks around the room assisting students.</li> <li>-The lesson plan informs the activities that will serve as ‘reinforcement practice’ so that the new concept/s are not forgotten.</li> <li>-Reinforcement practice are planned to be practiced after students have understand the new concepts.</li> <li>-The lesson plan describes the reinforcement practices (i.e., homework, individual or group work in class).</li> <li>-Assessment tools are designed to address instructional objectives and standards.</li> <li>-Assessment practices are open-ended, engaging and relevant.</li> <li>-There are indications of assessment modifications to accommodate students with special needs.</li> </ul>	<ul style="list-style-type: none"> <li>-Lessons are logically sequenced, so that learning builds progressively; connections between lessons are clearly made</li> <li>-Very few warm-ups are provided</li> <li>-The cited activity relates to the objectives of the lesson.</li> <li>-Lessons always start with the same opening activity.</li> <li>-The lesson plan simply lists the strategies to be employed during this stage of the lesson.</li> <li>-The lesson plan lists the activities the students will practice to demonstrate their grasp of the new learning.</li> <li>-There is a list in the lesson plan informing the activities that will help students practice the new concept.</li> <li>-The lesson plan does not tell when the students will use the ‘reinforcement practices.</li> <li>-Assessments are linked to objectives and standards.</li> <li>-There is no variety of assessment practices.</li> </ul>	<ul style="list-style-type: none"> <li>-Lessons do not have a logical sequence. Little opportunity to check for students’ understanding, no warm-ups are included in the lesson</li> <li>-Lesson/s does not include an opening activity.</li> <li>-The lesson plan does not inform about the strategies the teacher will employ to provide students with the needed knowledge or skills.</li> <li>-No guided practice opportunities are cited in the lesson.</li> <li>-There is no information in the lesson plan relating to opportunities for students to practice what they have learned in the current and previous lessons.</li> <li>-Assessment provides little or no evidence for student understanding of the new concept/skill.</li> </ul>
14. Reference	<ul style="list-style-type: none"> <li>-At least ten references are cited (at least three references from the course and seven references from external sources)</li> <li>-Reference sources are indicated and cited clearly</li> </ul>	<ul style="list-style-type: none"> <li>-Five to nine references are cited</li> <li>-Reference sources are indicated and cited clearly</li> </ul>	<ul style="list-style-type: none"> <li>-One to four references are cited</li> <li>-Reference sources are indicated and cited vaguely</li> </ul>
15. Appendixes	-Attach all necessary information that help readers understand the project (e.g., instruments, curriculum, working sheets)	-Attach most of the relevant information that help readers understand the project (e.g., instruments, curriculum, working sheets)	-Attach only part of relevant information that help readers understand the project (e.g., instruments, curriculum, working sheets)
16. Mechanics of English	<ul style="list-style-type: none"> <li>-Appropriate expression of concepts, varied and accurate vocabulary, no errors occur with regards to grammar, conventions and spelling.</li> <li>-Lesson plans are consistent in format</li> </ul>	<ul style="list-style-type: none"> <li>-Clear expression and vocabulary, some mechanical errors exist but not to get in the way of understanding.</li> </ul>	<ul style="list-style-type: none"> <li>-Some mechanical errors exist but not to get in the way of understanding.</li> </ul>

		-Lesson plans have some formatting problems.	-Many errors with regards to grammar, spelling, and conventions. -There is no obvious formatting structure
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### Appendix 6: Guidance for Evaluating Lesson Plans

This following checklist provides basic information to guide your lesson plan evaluation. You may generate your merit and critique reports/presentations in terms of this general checklist. However, each lesson plan has its own strengths and weaknesses, you are encouraged to evaluate lesson plans by analyzing its own characteristics.

1. Does this lesson plan correspond to TEKS? For which grade?
2. Are goals well defined and appropriate for these students?
3. Are activities properly designed for achieving these goals?
4. Does this lesson plan provide resources (e.g., equipment, space, time) for science inquiry activities?
5. Does this lesson plan provide instructions for facilitating students' science inquiry skills?
6. Do activities enable students to connect with the goals in personally meaningful ways?
7. Does the plan allow students to rehearse the skills required for this lesson?
8. Is the cognitive demand on students appropriate?
9. Do the subject matter cognitive demands allow students to connect their prior knowledge?
10. Are the materials in the lesson plan comprehensible?
11. Does the lesson plan provide sufficient information about how to prepare equipment and activities for students?
12. Is there sufficient use of visuals (e.g., realia, graphic organizers, etc.)?
13. Does the lesson take into account students' native languages and cultures?
14. How are students' speaking, listening, reading, and writing integrated into the lesson?
15. Do materials and activities take into account the learning styles of students?
16. Is there opportunity for students to ask questions and interact with material and other students?
17. Is there any assessment? Are they appropriate for students?
18. Do lessons include a variety of activities, materials and teaching methods?
19. Does the lesson plan articulate possible teaching or learning difficulties? Is there any solutions for these difficulties?
20. Are differences among students addressed? (visual, oral, diversity, students with special needs, ESL).

### Appendix 7: Grading Rubric for "Lesson Plan Presentations"

	Excellent (76-100%)	Great (51%-75%)	Acceptable (26-50%)	Not acceptable (0-25%)
Content	The presentation clearly presents all components of the lesson plan.	The presentation presents the major components of the lesson plan with clarity.	The presentation only presents a few components of the lesson plan with clarity.	The presentation only presents a few components of the lesson plan and does not explain its logics.
Materials	The presentation presents all materials covered in the lesson plan and explains their use in the lesson plan.	The majority of the materials required in the lesson plan are presented.	Only a few materials required in the lesson plan are presented.	No materials required in the lesson plan are presented.
Clarity	The presentation is well-structured, clear and easy to follow	The majority of the presentation is easy to follow	The majority of the presentation is unclear and confusing	The presentation has no structure and difficult to follow
Validity	These points are well supported with solid arguments and elaborations	The majority of these points are well-articulated	The majority of these points are not well-articulated	These points are not articulated and not convincing

**Appendix 8: Grading Rubric for “Critique Presentations” on Lesson Plans**

	Excellent (76-100%)	Great (51%-75%)	Acceptable (26-50%)	Not acceptable (0-25%)
Clarity	The presentation is well-structured, clear and easy to follow	The majority of the presentation is easy to follow	The majority of the presentation is unclear and confusing	The presentation has no structure and difficult to follow
Fruitfulness	The presentation includes at least 5 merits and 5 demerits and suggestions to support the lesson plan evaluation	The presentation includes 6-9 merits/demerits and suggestions to support the lesson plan evaluation	The presentation includes 3-5 merits/demerits and suggestions to support the lesson plan evaluation	The presentation includes 1-2 merits/demerits and suggestions to support the lesson plan evaluation
Validity	These points are well supported with solid arguments and elaborations	The majority of these points are well-articulated	The majority of these points are not well-articulated	These points are not articulated and not convincing

**Appendix 9: Grading Rubric for “Two Written Reviews on Lesson Plans”**

Excellent 67-100%	Satisfactory 34-66%	Underperform 0-33%
-Praise for merits are well articulated with logical reasoning and supported by scholarly work -Identifications of weaknesses and suggestions for improvements are well articulated with logical reasoning and supported by scholarly work -All references follow APA format	-Praise for merits are partially articulated with logical reasoning and supported by scholarly work -Identifications of weaknesses and suggestions for improvements are partially articulated with logical reasoning and supported by scholarly work -Most of references follow APA format	-Praise for merits are not articulated with logical reasoning and supported by scholarly work -Identifications of weaknesses and suggestions for improvements are not articulated with logical reasoning and/or supported by scholarly work -Only some references follow APA format

**Appendix 10: Grading Rubric for “Science Teaching Philosophy”**

Excellent 67-100%	Satisfactory 34-66%	Underperform 0-33%
-Philosophy statement addresses your beliefs about science education, teaching and learning in formal and informal settings, interactions in the science classroom (student-student and student-teacher) -The tone in your philosophy statement is reflective, clear, and personal (in your writing you use the ‘I’ instead of the third person) -Detailed and reflective descriptions of your experiences as a science learner -Appropriate expression of concepts, varied and accurate vocabulary, no mechanical errors.	The assignment covers most of the requirements.	The assignment covers only a few requirements.