BED/ELED 4311: Teaching Science in the Dual Language/Elementary School Classroom
(CRN: 32237 & 32238)
Summer 2017

Contact Information
Instructor: William Medina-Jerez, PhD.
UTEP Department of Teacher Education
Office: Education Building 604
Phone: (915) 747-8608
E-mail: Via Blackboard wjmedinajerez@utep.edu
Office hours: Tuesday & Thursday 2:30 – 4:30 pm

I will try to answer Blackboard emails and messages within the first day of receiving them (Monday-Friday). E-mails received after 5:00 pm Friday will be answered by Monday.

Course Description:
Number: BED/ELED 4311: Teaching Science in the Dual Language/Elementary School Classroom
Time: Tuesday and Thursday 5:00 pm– 10:00 pm
Location: Education Building Room 405

Purpose:
The two major goals of this course are to assist preservice elementary teachers’ (PSETs) in examining their beliefs about science teaching and learning and to portray science education from the socio-transformative constructivist (sTc) viewpoint as an engaging and fruitful activity. This course also intends to develop in PSETs the knowledge and dispositions necessary to implement inquiry- and STEM-based science lessons.

This course will assist you (PSET) in critically examining the theories, research, pedagogical approaches, and materials associated with effective learning and teaching in an elementary science/dual language classroom. This course will focus on the knowledge and skills you need to design and implement a science learning environment where every student is held to high expectations and encouraged to achieve maximum learning. You will learn to develop instructional strategies using the Texas Essential Knowledge and Skills (TEKS) for science, the Next Generation Science Standards (NGSS), STEM curricular materials, instructional models such as sheltered instruction and the 5E Instructional Model. During the Science Teaching event (See course calendar), you will use concepts from Standards I, III, VI, and V of the Pedagogy and Professional Responsibilities Standards (PPR) with particular emphasis on constructing and implementing instructional strategies, informal and formal assessment, and managing the learning environment. This course is designed to address the following science standards:

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

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

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

**Guiding Principles for this Course**

This course is organized around the community of practice and service learning principles, and the four strands of science learning (Michaels, Housse, & Schweingruber, 2008):

**Principle 1—Community of Practice:** is a concept that depicts how people work together for their common interests and learn from each other’s expertise to develop themselves personally and professionally. To form a community of practice in this course, students are provided with various opportunities to communicate their opinions, share their learning, and help each other improve. The peer review activities exemplify the practice of this principle.

**Principle 2—Service Learning:** is a teaching method that aims to enrich learning experiences and strengthen communities through services. The science teaching event provides students with an opportunity to contribute what they learn in this course to elementary students in our community.

**Principle 3—Reflecting on scientific knowledge** (Understanding how scientific knowledge is constructed). This strand will be addressed in the Nature of Science (NOS) activities. Proficient science learners understand what science is and how it works.

**Resources:** There is no book for this course. There will be numerous handouts, class notes on lectures, discussions and presentations. I will make articles and other materials available throughout the course as needed. There is also a Blackboard platform to which you will be automatically connected by being registered for this course. The Blackboard tool is intended to be a supplement to this course; there you will be able to access, quizzes, assigned readings, class notes and other important resources you may want to review on your own. This information will be available in the Course Content area of the navigation menu.

Additional resources we will be using:

- English Language Proficiency Standards (ELPS)
  http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4
- National Science Teachers Association
  (NSTA) http://www.nsta.org/default.aspx
- Science Teachers Association of Texas
  (STAT) http://www.statweb.org/
- Texas Essential Knowledge and Skills (TEKS)
  http://www.tea.state.tx.us/index2.aspx?id=6148
- Texas Safety Standards http://www.utdanacenter.org/sciencetoolkit/safety/
- The New Generation Science Standards (NGSS)

**Technology Requirements**

- Each participant must be able to use their UTEP Blackboard account. You MUST have both a UTEP email address and password to take this course.
- You must have access to UTEP email and Blackboard. If you do not have one yet, you may apply for your UTEP email account, login, and password from a form available online at: https://newaccount.utepl.edu
**Technical Assistance:** The University of Texas at El Paso offers complete technical information and help desk support at: [http://issweb.utep.edu/techsupport/](http://issweb.utep.edu/techsupport/).

**Professional Expectations of Students:** Part of your preparation as a teacher includes following a professional code of behavior and responsibility. Therefore, you are expected to treat all members of the class and your instructor with respect. Consider each class as a *meeting with colleagues in your field* and a great opportunity to exchange ideas. Attending class meetings on time and remaining for the entire scheduled period, being well prepared, and participating in classroom discussions are key parts of professional behavior. It is your responsibility to:

- Examine the Blackboard platform for this class, and inform your instructor by the second class meeting if you run into difficulties interacting in this environment.
- Read all the class materials thoroughly and continually consult the course schedule in order to keep up on all information associated with this course.
- Participate fully in all class activities and collaborate closely with your teammates.
- Be actively present in class; stay focused on the learning activities.
- Submit ALL your course assignments via Blackboard and in the prescribed format.
- Be courteous and honest in communicating with others that shows respect and sensitivity to cultural, religious, sexual, and other individual differences among all class members.
- Provide constructive feedback that helps your teammates, class members, and the instructor improve their performance, and appreciate it when they provide you with the same.
- Use the assignment templates in the preparation and submission of your assignments. If you do not follow the directions presented in the templates you will lose points.
- **Set your cell phone into silent mode** before starting the class meeting. As stated above, each class is a meeting with colleagues in your field. Professionals turn off/silence their phones in a meeting with other professionals. A ringing phone disrupts because the sound of a phone attracts attention. Disruptions of the learning process are annoying.
- **iPads, tablets, or laptops in class:** I do not mind you using your iPad, tablet, or laptop in class as a resource for the learning taking place in the class meeting. Using your device in class for a different purpose shows a lack of respect for your teammates and instructor and disinterest in the course that is unprofessional.
- **Be persistent.** If you run into difficulties, do not wait! Contact your instructor (see Contact Information above), or check with one of your classmates through Blackboard email. Most problems are easily solved but we have to hear from you before we can help.
- Inform the instructor if you are going to be absent so that you can get an update on what you missed (i.e., assignments). If you miss class consult the Class Notes in the Content area of Blackboard.
- Be aware of your absences. It is the student’s responsibility to call attention to their presence in the class (and sign the attendance sheet) if they come in after the attendance is taken.
- Inform your instructor **as soon as possible** if you have problems submitting your assignments on Blackboard. If the system does not allow you to turn in the assignment, you must send it via email to your instructor before the due date. Assignments submitted one week after the due date will not be graded for full credit—see Assignment submission policy on page 8.

**Students Expectations of Instructor:** You can expect me to be on time, prompt with assignments and feedback, knowledgeable in the topics being covered; create and provide opportunities for you to practice fundamental pedagogical content, and to bring in experts in the areas to augment my background either where needed or simply advantageous. To the best of my ability, I will treat all students equally, fairly, pleasantly, and be readily available for help outside class time.
**Student Learning Outcomes:** It is expected that by the end of the course, the successful student will be able to:

1. Identify the value of inquiry as an instructional strategy.
2. Develop the ability to assist elementary school students in designing investigations using scientific inquiry.
3. Outline strategies for modifying content area lessons to accommodate English Language Learners (ELLs) according to guiding principles like those in the NGSS, the pertinent TEKS, and the Socio-Transformative-Constructivist (sTc) learning theory.
4. Understand and address the role of underrepresented groups in the science curriculum.
5. Identify and integrate quality Science, Technology, Engineering and Mathematics (STEM) curriculum materials (e.g., Engineering is Elementary [EiE]) into instructional activities relevant to elementary education learning settings.
6. Demonstrate and understand the implementation of different instructional strategies and teaching materials consistent with the goals of the Next Generation Science Standards (NGSS), and the applicable Texas Essential Knowledge and Skills (TEKS).
7. Develop a well-thought-out philosophy of science teaching.
8. Demonstrate proficiency in the use of the 5E Instructional Model as a tool for lesson planning that supports the teaching and learning of basic and integrated inquiry process skills.
9. Collaborate with peers in a scientific investigation to show a willingness to engage in science as a learner.
10. Collaborate with peers in our course in the analysis of effective and teaching methods for teaching elementary science.

### Assessment of Student Learning Outcomes

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Assessment of learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Quizzes</td>
<td>Learning outcomes: 1, 3, and 6</td>
</tr>
<tr>
<td>2. Lesson plan</td>
<td>Learning outcomes: 2, 3, 4, 5, 6, 9, and 10</td>
</tr>
<tr>
<td>3. Growth essays</td>
<td>Learning outcomes: 1, 4, 6, and 7</td>
</tr>
<tr>
<td>4. STEM presentations</td>
<td>Learning outcomes: 1, 2, 5, 8, 9 and 10</td>
</tr>
<tr>
<td>5. In-class activities</td>
<td>Learning outcomes: 1, 2, 5, 6, 8, 9 and 10</td>
</tr>
<tr>
<td>6. Final exam</td>
<td>Learning outcomes: 1, 2, 3, 4, 5, 6, 7, 9 and 10</td>
</tr>
</tbody>
</table>

### Grading Criteria

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Quizzes (3 online quizzes @ 10 points each) (IA)</td>
<td>30</td>
</tr>
<tr>
<td>2. 5E Lesson plan design and delivery (GA)</td>
<td>100</td>
</tr>
<tr>
<td>3. Growth Essays (IA)</td>
<td></td>
</tr>
<tr>
<td>- Essay 1: Impressionist Tale (20 pts)</td>
<td></td>
</tr>
<tr>
<td>- Essay 2: Philosophy statement draft 1 for peer review (10 pts)</td>
<td>70</td>
</tr>
<tr>
<td>- Essay 3: Philosophy statement final draft (40 pts)</td>
<td></td>
</tr>
<tr>
<td>4. STEM presentations</td>
<td>20</td>
</tr>
</tbody>
</table>
5. In-class Activities (includes online sessions) (5 points each)  
- Activity 1: ‘My views about science education concept map (IA)  
- Activity 2: Art and science grow together (IA)  
- Activity 3: Inquiry investigation part I (GA)  
- Activity 4: Scientific misconceptions  
- Activity 5: Review of a 5E lesson (GA)  
- Activity 6: Outlining the 5E lesson plan (GA)  
- Activity 7: Inquiry investigation part II (GA)  
- Activity 8: Lesson peer review (IA)  
- Activity 9: Art and science statement (GA)  
- Activity 10: Online threaded (IA-GA)  

6. Final [online test] (40 points) (IA)  

310 pts.

IA: Individual Assignment; GA: Group Assignment

Grades
Overall grading will be A-F, points weighted by percentages. All work is expected to be clearly written (and word-processed), reflect thoughtful response to the assignment guidelines, and be of high quality.

A = 90-100%  
B = 80-89.9%  
C = 70-79.9%  
D = 60-69.9%  
F = BELOW 60%

Description of the Assignments: Below you will find a description of each assignment for this course. Please do not hesitate to consult with me if you have any questions.

1. Three online quizzes: All online quizzes cover the assigned readings to date, and are due by the posted time on the deadline date (See course calendar). The format of the quizzes may include multiple choice and short answer questions that you will need to answer completely both with supporting evidence from the readings. Quizzes are also timed (30 minutes) so you should be sure to set yourself up in a quiet place to take this in one attempt. Be sure to save your answers after each response and finally submit the quiz when you have it completed. There will be four opportunities available for you to complete this requirement. In case you complete the four quizzes, instructor will use your best three score in the calculation of your grade for this assignment.

   If you run into technical difficulties while completing and/or submitting your quiz, you will have to opportunity to finish the test in the instructor's office, in a paper-and-pencil format, and for the time you had left in your first attempt. In the case of completing the quiz in the paper-and-pencil format you will be provided with new questions.

2. Lesson plan: Three or four students work as a group to design a 5E lesson plan that addresses the applicable TEKS and the Engineering by Design Process. Students are provided with a lesson template to fill out. The components should be written clearly in the lesson plan: (a) title and grade, (b) learning objectives, (c) Links to TEKS, (d) list of materials, (e) the phases of the 5E Learning Cycle: Engage, Explore, Explain, Elaborate, and Evaluate, (f) references/bibliography, and (g) supportive documents (i.e., activity guide, hand-out). We will plan to deliver this lesson plan to a group of elementary students in the local community.

The 5E lesson plan (single-spaced, 2-3 pages long only plus supportive documents [i.e., activity guide]) will be submitted through the BLACKBOARD platform, and will be peer reviewed. Your instructor will
assign each group another group’s lesson for review. The lesson will be graded by the course instructor.

Each student will be expected to complete this review using the checklist and the assignment rubric provided in the Course Content area of the Blackboard platform (Rubric folder). Reviewers will submit their review through the Blackboard Assignments section and by the assigned due date.

3. Growth essays

**Essay 1: Impressionist Tales**

This is a 1-page long (double-spaced) essay that includes two paragraphs focused on a science learning episode. Impressionist Tales (Bryan & Tippins, 2005) portray highly personal perspectives of a special moment in time. They are written with the intention of (a) drawing the reader into the image—to make the reader see, hear, smell, feel, and taste what the story teller describes; they also (b) use evocative language that reveals the writer’s deepest feeling about the topic. Impressionist tales are similar to impressionist paintings which are set out to capture a scene in a special instant or moment of time... what the painter sees is what the viewer sees. Impressionist painters (Monet, Van Gogh, and Renoir) attempted to evoke a participatory sense in the viewer by painting every day, common, more familiar scenes. You will integrate this story into your science teaching philosophy statements (Essays 2 and 3).

It has been proposed that educators need to be aware of and confront their own perspectives, especially those informing their professional conceptions before attempting to change them (Putman & Borko, 1998; Avraamidou, 2013).

*Find samples of impressionist tales in Blackboard. The instructor will introduce this writing format in class.

**Essays 2 & 3: Science Teaching Philosophy statements (first and final drafts) *

There are different reasons for having a “science teaching philosophy.” It gives you the chance to situate your science teaching and learning perspectives, revitalize your views and gain confidence to face your profession. It is also highly beneficial for you to have this statement to share with prospective employers as a competitive tool to set yourself above other candidates. You should begin your own philosophy of [science] teaching even before your placement in a field experience. Expect your thoughts about education to change as you learn and grow professionally. Allow this reflective exercise to show your growth within the profession across time and thus renew your dedication to the field of education. Research has shown that prospective teachers’ personal histories with science learning (both positive and negative) have a great influence on how they teach science. Remember, this is a science teaching philosophy statement, not an education philosophy statement.

In this 1 ½ page (double spaced) statement, you are expected to convey your views about the teaching and learning of science in elementary school classrooms. Make sure to: a) address briefly your essay one—one or two sentences, b) incorporate ideas, concepts, and principles discussed and practiced in class and c) in the final draft, address the comments and questions provided by your peers and the instructor in the revision of the first draft. Statements are cumulative or emergent; they evolve by addressing comments and suggestions from the instructor and including new evidence and ideas from class topics, discussion, and activities.

Note that **essay 2** will be submitted for a blind, peer review exercise—the instructor will give each student a philosophy statement (essay 2) to review. You will earn the points by submitting on time your essay (5 pts) and for reviewing the assigned essay (5 pts). Each student will receive feedback and comments on essay 2. **Essay 3** (final draft of your science teaching philosophy) will be reviewed and
graded by the instructor.

Here are some ideas for your essay 2. Remember this essay may change by the final draft—be honest and humble if you are unsure at this point.

- Your previous experiences as a science learner
- Your goals, where you want to “go” professionally
- Why you decided to enter the teaching profession
- Your definition of teaching and learning in formal and informal settings
- Your role in helping students achieve and develop
- Your style and belief about effective teaching
- How you wish to be remembered by students
- Why you believe teaching is valuable
- Recall someone who positively affected your school experiences
- Your personal characteristics and strengths

*See Science Teaching Philosophy samples and rubric in the course platform (Blackboard).

4. **STEM presentations**: Students work in group (2-3 members per group) in the planning and delivery of a STEM-based hands-on task. The focus of this presentation is on the use of the Engineering by Design Process protocol. Presenters will engage their peers in the classroom in the execution of the task. Each group is responsible for assembling the needed materials and handouts. The instructor will model this task in class before groups sing up for these presentations.

5. **In-class activities (includes the online sessions)**: These are both individual and group activities that will take place in class, during the face-to-face class meetings, and online as part of the virtual class sessions. In each class we will engage in activities that illustrate and document exemplary science learning/teaching strategies, and/or exemplify main ideas in the assigned readings.

See each in-class activity highlighted in the course calendar.

6. **Final exam**: This examination will cover readings, class notes, topics addressed in class, and individual and group projects. Sample questions and format will be discussed in class.

**Academic Policies**

**Assignment Submission**

Your assignments are expected to be submitted online (via Blackboard) using the assignment template on the scheduled day and time; submit them according to the prescribed format (e.g., written report). Late work will not be accepted for full credit unless you have evidence of extenuating circumstances. Unfortunately, sometimes less than excusable circumstances arise even for professionals in the field and you made need an extension. However, I will only agree to grade late work for the first week following a due date, deducting 25% off the total grade. No assignments will be accepted past one week late. Plan carefully to ensure you meet the deadlines. If you wait until the last minute, things that can go wrong often do. Your computer will crash, the internet connection stops working, etc. Please ask if you have questions or concerns about how to do any assignment in this course. You need to check your Blackboard email regularly for communications from your instructor. Once you submit your assignment make sure it is posted.

Assignments will be submitted in the Assignments area of the navigation menu, and will need to be posted as Word files or as a PowerPoint (PPT) only (no rft. or Prezi formats, please). When submitting a group
assignment, your group will designate a member to be responsible for the submission of the project—this is part of the goals your group will set up in class. Please, include in each submission the names of the students [and their responsibilities] that participated in and contributed to the preparation of the group project. Assignments that are labeled “missing” by the Blackboard system will not be accepted without the instructor’s prior written approval [email communication]. You will not be able to submit your assignments after the due date. It is your responsibility to inform your instructor ‘as soon as possible’ if you run into technical difficulties while submitting/posting your assignments on Blackboard. If this happens, you need to send your assignment via email before the due date so that your assignment can be graded for full credit.

Attendance Policy: Learning in this class is considered a communal endeavor as well as an individual undertaking. Class attendance is crucial for a full understanding of course material, because many of the topics and content will be taught and communicated through class demonstrations, activities, and discussions. If you are absent from a class contact your instructor or another student to find out what occurred during the class you were absent from. Three tardies (and/or leaving early) will result in an unexcused absence.

1. Your 1st absence is excused.
2. Your 2nd absence will reduce your final grade 5 %.
3. Every absence after your 2nd reduces your final grade 10 % per absence.

UTEP Teacher Education Department Policy on Course Absences
The UTEP Teacher Education Department considers missing two weeks of class excessive. The student may be dropped for lack of attendance. If you miss two weeks of class, contact your instructor immediately.

Communicating Effectively Online
When we talk face-to-face, we expect other people to observe certain rules of behavior. The same is true online. Here are a few pointers to help you communicate more effectively via e-mail and discussion boards:

- Clearly summarize the contents of your message in the subject line of your e-mail AND your discussion board postings.
- Avoid using all capital letters. USING ALL CAPS MAKES IT LOOK LIKE YOU’RE SHOUTING! IT’S ALSO MORE DIFFICULT TO READ.
- Avoid using sarcasm in your postings and e-mail messages. Sarcasm does not translate well in the online world. If you have a dry sense of humor, use smiles :) to defuse what could be constituted as an abrupt message (but don’t over use them! :)).
- More information on Netiquette can be found at: www.albion.com/netiquette

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, 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 (HOOP) 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 Office of disabled Student Services located in Union E Room 203. Students who have been designated as disabled must reactivate their standing with the Office of Disabled Student Services 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 Disabled Student Services. You may call 747-5148 for general information about the Americans with Disabilities Act (ADA).

The Disabled Student Services Office can also be reached in the following ways: Web:
http://www.utep.edu/cass/  
Phone: (915) 747-5148  
Fax: (915) 747-8712

**Course Schedule and/or Assignment Changes**
The course instructor reserves the right to adjust the course syllabus or change assignments as needed. While every effort will be made to adhere to the calendar and the course outlines, there will undoubtedly be changes due to unexpected situations or pacing that may arise during the semester. Every attempt will be made for advance ‘warning.’ These modifications will be based on the specific needs of all the students in the course, but not to exceed difficulty or the due dates of the originally proposed assignment.

**Assigned Reading Material:** Readings will be assigned and available via Blackboard in the Course Content Area/Course Readings. You will be responsible for reading these materials before class.

**Plagiarism:** Cheating is unethical and not acceptable. Plagiarism is using information or original wording in a paper without giving credit to the source of that information or wording: it is also not acceptable. Do not submit work under your name that you did not do yourself. You may not submit work for this class that you did for another class. If you are found to be cheating or plagiarizing, you will be subject to disciplinary action, per UTEP catalog policy. Refer to http://www.utep.edu/dos/acadintg.htm for further information.

**Multiple Submissions:** When turning in assignments, students may not resubmit work done for other courses. No credit will be given for a resubmission of a project or paper given in another class.

**Incomplete Grades:** An incomplete may be given if a student provides evidence of a documented illness or family crisis that precludes successful completion of the course.

**Format and Submission:** All written assignments should be double space *(except lesson plans)*, font size 12 with 1 inch margins and **submitted on Blackboard.** Formal written projects are to follow the American Psychology Association (APA) format. *Please ask if you have any questions about using the APA format, I will be happy to help!*
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments Due</th>
</tr>
</thead>
</table>
| 1    | June 13| • Introduction and overview<br>• How students learn science in (and outside) the classroom?<br>• Who is a scientist?<br>• Impressionist Tales<br>• Basic and integrated inquiry skills: The popcorn activity<br>• Engineering by Design: Investigating with parachutes<br>• STEM curricula *(groups sign up for STEM presentations)*<br>• Examining student work | Read the syllabus, and make sure to fill out and submit the Student Profile form in the next class meeting.  
Read [in class]:<br>• *Yager: Never playing the game*<br>• *Finson: Inference vs. Observation*<br>• *Colburn: An inquiry primer*<br>• *Scribner-MacLean: More than just guessing*  
**Take online quiz #1 before next class** |
|      | June 15| • The Nature of science (NOS)<br>• Scientific misconceptions<br>• **Activity 2:** Art and science grow together<br>• Measuring with toys<br>• Interactive word walls<br>• **Activity 3:** Inquiry Investigation Part I | Read before class:<br>• *Crowther, Lederman and Lederman: Understanding the true meaning of the nature of science*<br>• *Porter et al: The art and science of notebooks*<br>• *Crowther et al: Academic vocabulary instruction*  
**Submit today your student profile form and your Essay 1 (Impressionist Tale)**<br>**Take Online quiz #2 before next class**<br>**STEM presentations** |
| 2    | June 20| • **Activity 4:** Report on scientific misconceptions<br>• The 5E Model<br>• Observing, collecting data, predicting, and constructing graphs<br>• Bird survey on campus<br>• **Activity 5:** Review of a 5E lesson<br>• **Activity 6:** Outline of a 5E lesson | Read:<br>• *Bybee: The 5E Model*  
**STEM presentations**<br>**Take online quiz #3 before next class** |
| June 22 | • Literacy connections  
• Accommodating ELLs in the science classroom  
• Writing in the science classroom  
• Science journaling  
• **Activity 7:** Inquiry investigation part II | Read:  
• *Musakata:* Lessons from the Little Prince  
• *Armon and Morris:* Integrated assessment for ELLs  
*Take online quiz #4 before next class. Submit group’s 5E lesson first draft STEM Presentations* |
| --- | --- | --- |
| June 27 | • **Activity 8:** Lesson peer review  
• **Activity 9:** Art and science statement  
• Inquiry project presentations  
• Who is a scientist? II | **STEM presentations** |
| June 29 | Online Session – Threaded Discussion  
(Activity 10) | • Submit review of Essay 2 |
| July 4 | Independence Day Holiday  
University Closed | |
| July 6 | **Science Teaching Event: Delivery of 5E Lesson** | • Submit 5E lesson (one per group) |
| Finals week | | • Submit Essay 3  
• *Take final exam on Blackboard between 07-10 and 07-14 by 5:00 pm* |

**References**


**Trade books used in this course**

ELED 4311: Teaching Science in the Elementary School – spring 2017

Student Profile

Name: ____________________________

Objections to syllabus or what other content do you think this course should cover and why?

________________________________________________________________________

________________________________________________________________________

Any additional comments you may have (e.g. what you hope to do professionally, health problems, experiences at UTEP, etc. that your instructor should be informed).

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Also feel free to discuss with the instructor any difficulties you may have with the course.

*I read and fully understand the requirements and course policies as stated in this syllabus.*

________________________________________________________________________

Student Signature __________________ Date __________________
## Assignment Rubrics

### Growth Essay 1: My Impressionist Tale

<table>
<thead>
<tr>
<th>Component</th>
<th>20 ------------------------</th>
<th>14 ------------------------</th>
<th>6 ------------------------</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td>• The essay is 1-page (single-spaced) long.</td>
<td>• The essay is 1 – ½ pages (single-spaced) long.</td>
<td>• The essay is &gt;1 – ½ pages (single-spaced) long.</td>
</tr>
<tr>
<td><strong>One science learning episode</strong></td>
<td>• Addresses one meaningful science learning experience</td>
<td>• Addresses one science learning episode but fails to highlight its relevance</td>
<td>• Addresses more than one science learning episode</td>
</tr>
<tr>
<td></td>
<td>• Identifies time and location</td>
<td>• Identifies either time or space</td>
<td>• Missed to identify time and location</td>
</tr>
<tr>
<td></td>
<td>• Describes in detail the episode</td>
<td>• Partial description of the learning episode</td>
<td>• Vague description of the episode</td>
</tr>
<tr>
<td></td>
<td>• Identifies the participants of the episode.</td>
<td>• Identifies the participants of the episode.</td>
<td>• Identifies only the main protagonist of the episode</td>
</tr>
<tr>
<td></td>
<td>• Draws the reader into the episode being described and uses evocative language that reflects what the writer feels about the topic.</td>
<td>• Partially draws the reader into the episode being described; the use of evocative language does not fully reflect what the writer feels about the topic.</td>
<td>• Does not draw the reader into the episode; the use of evocative language is minimal.</td>
</tr>
<tr>
<td><strong>Mechanics of English and Format</strong></td>
<td>• Appropriate expression of concepts, accurate vocabulary, no errors occur with regard to grammar, conventions and spelling.</td>
<td>• Clear expression and vocabulary, some mechanical errors exist but do not get in the way of understanding.</td>
<td>• Unclear expression of concepts, mechanical errors exist. Many errors with regard to grammar, spelling and conventions.</td>
</tr>
<tr>
<td></td>
<td>• Document is consistent in format (font type and size).</td>
<td>• Document has some formatting problems.</td>
<td>• There is no formatting structure.</td>
</tr>
<tr>
<td></td>
<td>• Document is 1-page long</td>
<td>• Document is more than 1-page long.</td>
<td>• Document is more than 1-page long.</td>
</tr>
</tbody>
</table>
# Growth Essay 2: Science Teaching Philosophy Statement

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Excellent (5)</td>
</tr>
<tr>
<td>1. Philosophy of science teaching statement is 1 – 1 ½ pages and double-spaced; submission uses the assignment template.</td>
<td></td>
</tr>
<tr>
<td>2. Philosophy statement addresses:</td>
<td></td>
</tr>
<tr>
<td>• Your beliefs about science education</td>
<td></td>
</tr>
<tr>
<td>• Addresses essay one (prior learning experiences in science and L2).</td>
<td></td>
</tr>
<tr>
<td>3. The tone in your philosophy statement:</td>
<td></td>
</tr>
<tr>
<td>• Incorporates science education terminology (e.g., inquiry learning, hypothesis, misconceptions)</td>
<td></td>
</tr>
<tr>
<td>• Personal (in your writing you use the ‘I’ instead of the third person)</td>
<td></td>
</tr>
<tr>
<td>4. Mechanics of Standard English</td>
<td></td>
</tr>
<tr>
<td>Appropriate expression of concepts, varied and accurate vocabulary, no mechanical errors. Make sure to do a spell check before submitting/posting your assignment.</td>
<td></td>
</tr>
<tr>
<td>5. Revision of the concept map from Activity 1.</td>
<td></td>
</tr>
<tr>
<td>Answer these questions as a separate note at the end of the essay:</td>
<td></td>
</tr>
<tr>
<td>• Do you have new ideas now that you want to add to your science education map?</td>
<td></td>
</tr>
<tr>
<td>• What changes/additions would you make? (This concept map is not part of the 1 ½ page philosophy statement). Add a revised copy to your submission.</td>
<td></td>
</tr>
</tbody>
</table>
Growth essay 3: Science Teaching Philosophy Rubric (Final Draft)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Philosophy of science teaching statement is <em>1 – 1 1/2 pages and double-spaced</em>, submission uses the assignment template.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

2. Philosophy statement:
   - *Is fully focused* on science teaching and learning in elementary/middle school classrooms.
   - Briefly addresses the *autobiography* (essay 1) as a science learner.
   - Clearly *addresses reviewers’ comments* on Essay 2. Use bullets or numbers at the end to explain how each comment and suggestion was addressed.
   - *Incorporates science education terminology* (e.g., misconceptions, inquiry investigations)

   - On a separate page (#3).
     A. Provide a revision of the concept map constructed on the first class meeting.
        - Insert an updated version of your concept map.
        - What concepts/ideas have become relevant in your concept map? Why?

     B. In the drawing/painting done in class (activity 3) you conveyed your views about how to teach and learn science in elementary school classrooms. If today you were to produce a second drawing, would your depiction look different? How?

   C. Mechanics of English
      - Varied and accurate vocabulary, no mechanical errors. Do a spell-check before submitting/posting your assignment.

   *For example:*
   *Reviewer’s comment 1: The statement goes beyond the space limit. I reorganized my statement and was able to put my ideas into a 1 1/2 page-document.*
### 5E Lesson Plan: ( /100 points)

<table>
<thead>
<tr>
<th>5 pts</th>
<th>3 pts</th>
<th>1 pt</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson title &amp; grade level</strong></td>
<td>- The title is intriguing, succinct and represents the lesson plan - The lesson is grade level specific (one grade level is identified)</td>
<td>- The title is intriguing and represents the lesson plan - Two to three grade levels are included</td>
</tr>
<tr>
<td><strong>Learning objectives</strong></td>
<td>- Concise description of what learners are expected and able to do by the end of the lesson - Objective statements include a variety of actions verbs (lower and higher order) that address different cognitive levels. - There is evidence in the evaluation section that students’ learning is linked to the concepts and skills addressed in the learning objectives. - Objective statements are clear enough that a substitute teacher would not have difficulties delivering the lesson. - Includes at least two objectives from each category (content and language).</td>
<td>- 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 connections with the evaluation section. - Some clarifications are needed; a substitute teacher may have difficulties delivering this lesson. - Includes learning objectives but they are not identified; the action verbs are vague (e.g., to study)</td>
</tr>
<tr>
<td><strong>TEKS alignment</strong></td>
<td>- Lists pertinent standards for the target grade level. - There is evidence (i.e., in the evaluation section) that student’s learning is linked to the listed standards.</td>
<td>- Listed standards do not fully relate to the lesson. - Partial evidence (i.e., in the evaluation section) that student’s learning is linked to the listed standards.</td>
</tr>
<tr>
<td><strong>Materials and Resources</strong></td>
<td>- Required tools and resources are listed. - Reference in procedures are clearly defined as to they are to be utilized.</td>
<td>- Most of the required resources and materials are listed. - Some reference or clear definition in procedures.</td>
</tr>
<tr>
<td><strong>Vocabulary Instruction</strong></td>
<td>- In this section, the lesson identifies one vocabulary instruction format (i.e., Tiered instruction, frontloading). - Lesson describes the use of the target vocabulary instruction format. The vocabulary instruction format is also addressed in the body of the lesson (5Es).</td>
<td>- In this section, the lesson identifies one vocabulary instruction format (i.e., Tiered instruction, frontloading). - Lesson describes the use of the target vocabulary instruction format but it is not addressed in the body of the lesson (5Es).</td>
</tr>
<tr>
<td>Lesson Body</td>
<td>30-20 pts</td>
<td>19-10 pts</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>-Vocabulary of the lesson is identified/listed (i.e., Tier 1, Tier 2, and Tier 3 words).</td>
<td>-Vocabulary of the lesson is vaguely identified/listed (i.e., Tier 1, Tier 2, and Tier 3 words).</td>
<td>-The assessment strategy identified in the body of the lesson is not clearly focused on the scientific terminology students encountered in the lesson.</td>
</tr>
<tr>
<td>-Lesson includes at least one assessment strategy focused exclusively on the scientific terminology students encountered in the lesson.</td>
<td>-The assessment strategy identified in the body of the lesson is not clearly focused on the scientific terminology students encountered in the lesson.</td>
<td>-The lesson does not include an assessment strategy focused on the scientific terminology students encountered in the lesson.</td>
</tr>
<tr>
<td>Lesson Body</td>
<td>5 pts</td>
<td>3 pts</td>
</tr>
<tr>
<td>-Lesson clearly describes what the teacher and the student will do in each stage of the 5E cycle.</td>
<td>General description of what the teacher and the student will do in each stage of the 5E cycle.</td>
<td>-Vague description of what the teacher and the student will do in each stage of the 5E cycle.</td>
</tr>
<tr>
<td>-Engagement (hook/attention grabber): describes one task that creates interest and leads students into exploration.</td>
<td>-Engagement (hook/attention grabber): unclear description of a strategy that creates interest. Engagement does not clearly connect with the exploration phase.</td>
<td>-Engagement (missing hook/attention grabber): activity or strategy does not create interest in the topic of the lesson.</td>
</tr>
<tr>
<td>-Exploration: describes an activity/strategy that encourages students to work together without direct instruction; students test and form new predictions; students try alternatives and record observations.</td>
<td>-Exploration: describes an activity/strategy that seems isolated, unrelated to the previous phase; although students are encouraged to work together they need teacher’s guidance and instruction; students practice some inquiry skills only (e.g., test predictions).</td>
<td>-Exploration: students are not encouraged to work together without direct instruction; students do not have the opportunity to practice inquiry skills (e.g., test and form new predictions, try alternatives, record observations).</td>
</tr>
<tr>
<td>-Explanation: includes at least 4 questions the teacher would use to lead a whole class discussion; teacher introduces new terms; [formally] provides definitions; uses students’ experiences as basis for explanations; [teacher] asks students for evidence/justification.</td>
<td>-Explanation: includes at least 2-3 questions the teacher would use to lead a whole class discussion; teacher introduces some new terms; [formally] provides some definitions; use experiences unrelated to students’ own work as basis for explanations; [teacher] fails to ask students for evidence/justification.</td>
<td>-Explanation: does not include questions the teacher would use to lead a whole class discussion; teacher does not introduce new terms; definitions are not provided; students’ previous experiences are not used as basis for explanations; students are not questioned for evidence/justification.</td>
</tr>
<tr>
<td>-Elaboration: describes an extension [new] activity that is hands-on/minds-on; there is evidence that students use this activity to apply concepts and skills.</td>
<td>-Elaboration: describes a known activity that is hands-on/minds-on; there is little evidence that students use this activity to apply concepts and skills.</td>
<td>-Elaboration: a new hands/minds-on activity is not described; there is no evidence that students use this activity to apply concepts and skills.</td>
</tr>
<tr>
<td>-Evaluation: includes both formative and summative assessment formats; assessments address the concept and skills stated in the learning objectives.</td>
<td>-Evaluation: includes both formative and summative assessment formats; assessments partially address the concept and skills stated in the learning objectives.</td>
<td>-Evaluation: includes a vague description of the assessment; does not identify the assessment type.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>References and Supporting Documents</th>
<th>5 pts</th>
<th>3 pts</th>
<th>1 pt</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Includes text books and websites references used in the lesson.</td>
<td>Includes some text books and websites references used in the lesson.</td>
<td>-Not included</td>
<td></td>
</tr>
<tr>
<td>-Supporting documents are included at the end of the lesson as appendixes.</td>
<td>-Some supporting documents are included at the end of the lesson as appendixes.</td>
<td></td>
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</tr>
</tbody>
</table>
| Mechanic of English and Format | -Appropriate expression of concepts, varied and accurate vocabulary, no errors occur with regards to grammar, conventions and spelling.  
-Lesson plans are consistent in format (e.g., double space, font size 12 with 1 inch margins, cited references when included follow the APA format).  
-Lesson template is used.  
-Lesson is 3-4 pages long (not including supporting documents) | -Clear expression and vocabulary, some mechanical errors exist but not to get in the way of understanding.  
-Lesson plan has some formatting problems.  
-Lesson template is not used  
-Lesson is 5-8 pages long (not including supporting documents) | -Some mechanical errors exist but not to get in the way of understanding.  
-Many errors with regards to grammar, spelling, and conventions.  
-There is no obvious formatting structure  
-Lesson template is not used  
-Lesson is >9 pages long (not including supporting documents) |

- Punctual submission of your lesson plan for peer review: /5 pts
- Merit presentation of your lesson plan in class: /5 pts

- Note that the [punctual] submission of your review is worth 5 points
The content of this course addresses the following Texas Examinations of Educator Standards (TExES) competencies in the domain for the Generalist EC-6 and Bilingual Generalist EC-6 programs.

| Competency: Safe and proper laboratory processes. | Competency: Scientific inquiry |
|-------------------------------------------------|---------------------------------
| The beginning teacher:                          | The beginning teacher:          |
| D. Selects and safely uses appropriate tools,   | A. Understands plans and        |
| technologies, materials for instructional       | implements instruction that     |
| activities………                                  | provides opportunities for all |
| E. Understands concepts of precision, accuracy  | students to engage in           |
| and error with regard to reading and recording  | non-experimental- and          |
| numerical data from a scientific                | experimental-inquiry investigations………………………………… |
| instrument……………………………………………………………. | B. Focuses inquiry-based         |
| F. Understands how to gather, organize, display | instruction on questions and    |
| and communicate data in a variety of ways (e.g.,|
| charts, tables, graphs, diagrams, written      | issues relevant to students and |
| reports, oral presentations).……………………………..      | uses strategies to assist       |
| G. Understands the international system of      | students with generating,      |
| measurement (i.e., metric system)               | refining and focusing scientific |
|                                              | questions and hypotheses………………… |
|                                              | D. Knows how to guide students |
|                                              | in making systematic observations and |
|                                              | measurements………………       |
|                                              | E. Knows how to promote the    |
|                                              | use of critical-thinking skills, |
|                                              | logical reasoning and scientific |
|                                              | problem solving to reach       |
|                                              | conclusions based on evidence…| |
|                                              | F. Knows how to teach students |
|                                              | to develop, analyze and        |
|                                              | evaluate different explanations |
|                                              | for a given scientific result…| |
|                                              | G. Knows how to teach students |
|                                              | to demonstrate an understanding |
|                                              | of potential sources of error   |
|                                              | in inquiry-based investigation…| |
|                                              | H. Knows how to teach students |
|                                              | to demonstrate an understanding |
|                                              | of how to communicate and      |
|                                              | defend the results of an        |
|                                              | inquiry-based                   |

These standards will be addressed and/or assessed with the following course activities and assignments

- 5E Lesson plan
- Inquiry investigation
- Bird tour on campus
- Popcorn activity
- Parachute activity

- 5E Lesson plan, final test, essays 2 and 3, and readings.
- Inquiry investigation (Part I), online quizzes
- Science Teaching Event
- 5E Lesson and Science Teaching Event
- Inquiry investigation and 5E Lesson
- Popcorn activity, parachute activity, bird watching tour, art and science activities
- Inquiry investigation
- Online and in-class quizzes, and readings
### Competency: Impact on daily life/environment

The beginning teacher:
- A. Understands that decisions about the use of science are based on factors such as ethical standards, economics and personal and societal needs.
- F. Understands the role science can play in helping resolve personal, societal and global challenges.

### Competency: Unifying concepts and processes in science

The beginning teacher:
- A. Understands how a unifying, explanatory framework across the science disciplines is provided by the concepts and processes of systems, order and organization; evidence, models and explanation; change, constancy and measurements; and form and function.
- B. Demonstrates an understanding of how patterns in observations and data can be used to make explanations and predictions.
- F. Understands how change and constancy occur in systems.
- G. Understands the complementary nature of form and function in a given system.

### Competency: Theory and practice of science teaching

The beginning teacher:
- A. Understands how developmental characteristics, prior knowledge and experience and students’ attitudes influence science learning.
- B. Selects and adapts science curricula, content, instructional materials and activities to meet the levels of interest, knowledge and understanding as well as the abilities, experiences and needs of all students, including English-language learners.
- C. Understands how to use situations from students’ daily lives to develop instructional materials that investigate how science can be used to make informed decisions.
- D. Understands common misconceptions in science and has effective ways to address those misconceptions.
- E. Understands developmentally appropriate design and implementation of hands-on learning experiences in science and selects effective, appropriate instructional practices, activities, technologies and materials to promote students’ scientific knowledge, skills and inquiry processes.

- Final test, and online quizzes
- Final test, and online quizzes
- Inquiry investigation
- In-class inquiry activities, and readings
- Inquiry investigation
- Inquiry investigation
- 5E Lesson (peer review, final draft, and delivery), online test, and online quizzes
**Competency: Assessment in science learning**

The beginning teacher:
B. Understands the importance of monitoring and assessing students’ understanding of science concepts and skills on an ongoing basis, including how to use formal and informal assessments of student performance and how to use products (e.g., projects, lab journals, rubrics, portfolios, student profiles, checklists) to evaluate students’ understanding of and participation in the inquiry process.
C. Selects — or designs — and administers a variety of appropriate assessment methods (e.g., performance assessment, self-assessment, formal/informal assessment, formative/summative assessment) to monitor students’ understanding and progress and to plan for instruction.

<table>
<thead>
<tr>
<th>Competency: Life science</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>The beginning teacher:</td>
<td></td>
</tr>
<tr>
<td>A. Understands that living systems have different structures that perform different functions.</td>
<td></td>
</tr>
<tr>
<td>B. Understands and describes stages in the life cycles of common plants and animals.</td>
<td></td>
</tr>
<tr>
<td>C. Understands that organisms have basic needs.</td>
<td></td>
</tr>
</tbody>
</table>

- Readings from weeks 5 and 6, 5E lesson plan (design, review, and delivery), and final test.
- Inquiry investigation (I, II, and III)