Contact Information
Instructor: William Medina-Jerez, PhD
Office Phone: 915-747-8608
Office: Education Building 604
E-mail: wjmedinajerez@utep.edu (Through Blackboard)
Office Hours through Blackboard Collaborate Ultra: Thursday (5:00 – 6:30 pm)
I will try to answer Blackboard emails within the first day of receiving them (Monday-Friday).
E-mails received after 5:00 PM Friday will be answered by Monday morning.

Purpose
The two major goals of this course are to assist preservice teachers’ (PSETs—you) in examining their beliefs about science teaching and learning and to portray science education from a multicultural viewpoint. In this context, the teacher is an agent of social change, a practitioner who actively contributes toward establishing a pluralistic society by making the classroom one of the most important settings where gender, equity, anti-discriminatory principles and multicultural understanding are modeled and practiced (Rodriguez, 1998).

This course will also assist you in critically examining the theories, research, pedagogical approaches, and materials associated with effective learning and teaching in elementary/dual language classrooms. 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 the 5E Instructional Model. In the lesson designs and critiques, 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 also 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.
Course Procedures

*This course will be fully conducted in Blackboard* through the University of Texas at El Paso and can be accessed through the My UTEP Web site (http://my.utep.edu). All class interactions will be done online and all materials will be delivered and received in Blackboard. Be sure to read all the class notes and additional documents thoroughly and to continually consult the course schedule in order to keep up on all information associated with this online class. In this delivery format, I encourage you to manage your time and complete the required course projects as indicated in the updated course calendar. Make sure to contact me in case you experience any difficulties navigating the Blackboard course platform or if you need clarification on course projects. Contact me so I can intervene at the right time.

There will be **weekly class notes** that I will be post no later than Monday morning of each week. The weekly class notes will appear as a link in the corresponding week folder (e.g., Week 1/Class Notes). Additionally, you will find (a) a **course module** associated with the content of [most] weeks as scheduled in the course syllabus—although this is an optional activity, I highly encourage you to interact with this content; (b) an in-group **threaded discussion** (TD) that will occur in the weeks indicated in the course calendar. Your instructor will randomly assign you to a TD each time. Your required participation in each TD will consists of two postings: one responding to the instructor’s prompt and one more in reaction to, or elaborating on a teammate’s posting. Note that **all assignments will be due no later than Sundays at midnight** according to the course calendar (See course calendar on page 5 of this course syllabus).

You want to examine and understand the environment of this class in Blackboard and the location of all class materials—please, do not hesitate to contact me with questions about how to navigate the Blackboard course platform, I will be happy to help you! It is recommended that you log in with great regularity in Blackboard to look for announcements, class notes, discussion posts, description of course assignments, and spaces for collaboration.

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 and other important resources you may want to review on your own.

Other materials we will be using:

- English Language Proficiency Standards (ELPS)
  [http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4](http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4)
- Science Teachers Association of Texas (STAT)
- Texas Essential Knowledge and Skills (TEKS)
- National Science Teaching Association (NSTA)
  [http://www.nsta.org/default.aspx](http://www.nsta.org/default.aspx)
- Texas Safety Standards
- The New Generation Science Standards (NGSS)
  [www.nextgenscience.org/next-generation-science-standards](http://www.nextgenscience.org/next-generation-science-standards)
Professional Expectations
Consider the virtual interactions in this class as a meeting with colleagues in your field and a great opportunity to exchange ideas. Being well prepared and participating in class projects and discussions are key parts of professional behavior. Make a commitment to:

1. **Be prepared.** Interact each week and complete your assignments in a timely manner.
2. **Check the course platform regularly.** Find each week's class notes posted in the course content area (Class Notes folder)
3. **Participate.** In this learning environment, we need to 'hear your voice.' We specially need to hear your personal comments, your reactions to what you have read, plus your own experiences. All of this input adds to the shared learning, and the sense of community in our course.
4. **Inform** your instructor ahead of time (and teammates if necessary) when you cannot participate in class or group projects, or you run into difficulties completing your tasks.
5. **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. Any derogatory or inappropriate comments are unacceptable and subject to the same disciplinary action that they would receive if they have occurred in the physical classroom. If you have concerns about something that has been said, please let your instructor know immediately.
6. **Provide constructive feedback** that helps your teammates and the instructor improve their performance, and appreciate it when they provide you with the same.
7. Make sure, that your answers to course assignments will be your own work.
8. **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.

*Instructor’s responses to your questions will be made available to the whole class via FAQ postings you will find in the navigation menu of the course platform.*

Students Expectations of Instructor
You can expect me to be prompt with assignments and feedback, knowledgeable in the topics being covered; create and provide opportunities for you to practice fundamental pedagogical content. I will treat all students equally, fairly, pleasantly, and be readily available for help.

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 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 pertinent TEKS.
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 and middle school 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. Reflect on the central components of your science teaching philosophy.
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 our course in the analysis of effective and teaching methods for teaching 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, 6, and 8</td>
</tr>
<tr>
<td>2. Lesson plan and STEM merit presentation</td>
<td>Learning outcomes: 2, 3, 4, 5, 6, and 8</td>
</tr>
<tr>
<td>3. Impressionist Tale and Science Teaching</td>
<td>Learning outcomes: 1 4, 6, and 7</td>
</tr>
<tr>
<td>Philosophy Illustration</td>
<td></td>
</tr>
<tr>
<td>4. Activities</td>
<td>Learning outcomes: 1, 2, 3, 4, 5, and 9</td>
</tr>
<tr>
<td>5. Threaded Discussions</td>
<td>Learning outcomes: 1, 2, 3, 4, 5, 6, 7, 8, and 9</td>
</tr>
<tr>
<td>6. Final exam</td>
<td>Learning outcomes: 1, 2, 3, 4, 5, 6, 7, and 8</td>
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Grading Criteria
The course will be assessed based on the following criteria:

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%          C = 70-79.9%   E = Below 60%
B = 80-89.9%         D = 60-90%

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Take four [out of 6] Online Quizzes (10 points each) (IA).</td>
<td>40</td>
</tr>
<tr>
<td>2. 5E STEM Lesson (IA/GA)</td>
<td>100</td>
</tr>
<tr>
<td>• First draft for peer review (5 pts)</td>
<td></td>
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<tr>
<td>• STEM activity delivery during the Merit Presentations, includes PPT (10 pts)</td>
<td></td>
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<tr>
<td>• Lesson peer-review (5 pts)</td>
<td></td>
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<tr>
<td>• Final submission (80 pts)</td>
<td></td>
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<tr>
<td>3. Reflecting in My Science Teaching and Learning (IA)</td>
<td>30</td>
</tr>
<tr>
<td>• Impressionist tale (10 pts)</td>
<td></td>
</tr>
<tr>
<td>• Science teaching philosophy illustration (20 pts)</td>
<td></td>
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<tr>
<td>4. Activities* (5 points each).</td>
<td>40</td>
</tr>
<tr>
<td>• Activity 1: My views about science education concept map (IA)</td>
<td></td>
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<tr>
<td>• Activity 2: My STEM Lesson Plan Part 1 (IA)</td>
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<tr>
<td>• Activity 3: Inquiry Activity Part 1 (IA/GA)</td>
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<tr>
<td>• Activity 4: Science Activity Analysis (IA)</td>
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<tr>
<td>• Activity 5: My STEM Lesson Plan Part 2 (IA)</td>
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<tr>
<td>• Activity 6: Inquiry Activity Part 2 (IA/GA)</td>
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<tr>
<td>• Activity 7: Science Activity Analysis (IA)</td>
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<tr>
<td>• Activity 8: Inquiry Activity Part 3 (IA/GA)</td>
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<tr>
<td>5. Participation in 4 [out of 7] Threaded Discussions (5 pts each) (IA)</td>
<td>20</td>
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<tr>
<td>6. Final Exam (IA) (50 points)</td>
<td>50</td>
</tr>
<tr>
<td>• Mentoring a student for an upcoming science fair (to be factor into final exam)*</td>
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</table>

Total Points 280

IA: Individual Assignment; GA: Group Assignment
*optional activity. See details in the assignment description section

The University of Texas at El Paso (UTEP) College of Education - Fall 2020
# Online Activities – Due Dates

<table>
<thead>
<tr>
<th>Pending Assignments</th>
<th>Date Open (Mondays)</th>
<th>Due Date—Closed (Sundays)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quizzes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quiz 1</td>
<td>Aug. 31 at 8:00 AM</td>
<td>Sept. 6 at 11:55 PM</td>
</tr>
<tr>
<td>Quiz 2</td>
<td>Sept. 7 at 8:00 AM</td>
<td>Sept. 13 at 11:55 PM</td>
</tr>
<tr>
<td>Quiz 3</td>
<td>Sept. 28 at 8:00 AM</td>
<td>Oct. 4 at 11:55 PM</td>
</tr>
<tr>
<td>Quiz 4</td>
<td>Oct. 12 at 8:00 AM</td>
<td>Oct. 18 at 11:55 PM</td>
</tr>
<tr>
<td>Quiz 5</td>
<td>Oct. 19 at 8:00 AM</td>
<td>Oct. 25 at 11:55 PM</td>
</tr>
<tr>
<td>Quiz 6</td>
<td>Nov. 16 at 8:00 AM</td>
<td>Nov. 22 at 11:55 PM</td>
</tr>
</tbody>
</table>

| **Impressionist Tale** | Sept. 7 at 8:00 AM | Sept. 13 at 11:55 PM |
| **Science Teaching Philosophy Illustration** | Nov. 30 at 8:00 AM | Dec. 3 at 11:55 PM |

| **5E STEM Lesson** |                     |                           |
| First draft for peer review (5 pts) | Oct. 26 at 8:00 AM | Nov. 1 at 11:55 PM |
| Online STEM Merit Presentations (PPT) | Oct. 26 at 8:00 AM | Nov. 1 at 11:55 PM |
| PPT (10 pts) | Nov. 16 at 7:00 AM | Nov. 22 at 11:55 PM |
| Lesson peer-review (5 pts) | Dec. 7 at 8:00 AM | Dec 11 at 11:55 PM |
| Final submission (80 pts) |                     |                           |

| **Group Threaded Discussions** |                     |                           |
| Threaded Discussion 1 | Aug. 31 at 8:00 AM | Sept. 6 at 11:55 PM |
| Threaded Discussion 2 | Sept. 14 at 8:00 AM | Sept. 20 at 11:55 PM |
| Threaded Discussion 3 | Sept. 21 at 8:00 AM | Sept. 27 at 11:55 PM |
| Threaded Discussion 4 | Oct. 5 at 8:00 AM | Oct. 11 at 11:55 PM |
| Threaded Discussion 5 | Oct. 12 at 8:00 AM | Oct. 18 at 11:55 PM |
| Threaded Discussion 6 | Nov. 16 at 7:00 AM | Nov. 22 at 11:55 PM |

| **Activities (5 pts each)** |                     |                           |
| Activity 1: Concept map (IA) | Aug. 24 at 8:00 AM | Aug. 30 at 11:55 PM |
| Activity 2: My lesson plan Part 1 (IA) | Sept. 14 at 8:00 AM | Sept. 20 at 11:55 PM |
| Activity 3: Inquiry Activity Part 1 (IA/GA) | Sept. 28 at 7:00 AM | Oct. 4 at 11:55 PM |
| Activity 4: Science Activity Analysis (IA) | Oct. 12 at 7:00 AM | Oct. 18 at 11:55 PM |
| Activity 5: My STEM Lesson Plan Part 2 (IA) | Oct. 19 at 7:00 AM | Oct. 25 at 11:55 PM |
| Activity 6: Inquiry Activity Part 2 (IA/GA) | Oct. 26 at 8:00 AM | Nov. 1 at 11:55 PM |
| Activity 7: Science Activity Analysis (IA) | Nov. 2 at 8:00 AM | Nov. 8 at 11:55 PM |
| Activity 8: Inquiry Activity Part 3 (IA/GA) | Nov. 30 at 8:00 AM | Dec. 3 at 11:55 PM |

| **Final exam (Online test) (50 pts)** | Dec. 7 at 8:00 AM | Dec. 11 at 11:55 PM |
1. Quizzes (IA): 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 include multiple-choice and short-answer questions that you will need to answer completely with supporting evidence from the readings. Quizzes are submitted through the Assessment section of the navigation menu. You want to read the articles before taking the quizzes; I also encourage you to consult the Reading Strategies folder in the navigation menu. 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 six online quizzes. In case you complete more than four quizzes, the instructor will use your best four scores in the calculation of your grade for this assignment.

2. Lesson Plan (GA): Individual or groups of two or three students work as a group to design a 5E STEM lesson plan that addresses the applicable TEKS and the Engineering by Design Process (EDP). The components should be written clearly in the lesson plan: (a) title, grade, and source (b) learning objectives, (c) Links to TEKS, (d) the phases of the 5E Learning Cycle: Engage, Explore, Explain, Elaborate, and Evaluate, (e) references/bibliography, and (f) supportive documents (i.e., activity guide, hand-out).

The 5E STEM lesson plan (single-spaced, 2-3 pages long, not including supporting 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. Each student will be expected to complete this review using the checklist at the end of the lesson document. Reviewers will submit their review through the Blackboard Assignments section and by the assigned due date.

3. My Views about Science Teaching and Learning

*Impressionist Tale*

This is a 1-page long (double-spaced) essay that includes two paragraphs: a science learning episode and a reflection. Impressionist Tales (van Maanen, 1988; 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 (e.g., Starry night) 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 everyday, common, more familiar scenes.

- Think back of your elementary, high school, or current college experience and write one impressionist tale/paragraph on a science learning episode.
- The second paragraph will present your brief reflection on the emotions you experienced as a learner on that occasion. It is argued that learning science is an emotional practice. In this paragraph you answer the questions "What emotions (positive/negative) did you experience in the event described above, and how did (or are still) those emotions impact your engagement in science learning throughout your schooling career?"

The first goal is for you to take time and reflect on your science learning experiences using a significant learning episode from your elementary, secondary, or tertiary education in science. The second goal deals with the concept of Critical Emotional Pedagogy (CEP) (Rodriguez, 2017). As teachers, we need to become aware of and understand not only our students’ (including ELLs) social and emotional experiences while engaged in science lessons, but also our own. Find samples of Impressionist Tales in Blackboard. The instructor will introduce this writing format in the weekly class notes.
Science Teaching Philosophy Illustration. The concept map (Activity 1 from Week 1) is a good starting point for this assignment; this map contains your initial ideas about science teaching and learning in your grade level of interest. The purpose of this activity is to have you reflect on your past and current views about how students should learn science—again, beginning with your own experience as a learner. Instead of writing an essay, we will use the art elements explored in Week 5 to produce a visual representation of your science teaching philosophy. You will use the media of your choice (e.g., ink, color pencils, water colors, chalks, acrylic, oil, collage, or other format).

*See illustration examples in Blackboard.

4. Activities: These are individual and group activities that will give you an opportunity to play the role of a learner in the mastery of exemplary science teaching and learning concepts. 

See activities highlighted in the course calendar section of the syllabus.

5. Threaded Discussions (TD). There will be seven Threaded Discussion prompts available (See course calendar) for you to complete the four required participations. Each TD will be posted on Mondays and will remain accessible until Sunday. For each TD, you are expected to make at least two contributions, one in response to the instructor’s prompt and one more in reaction to one of your team-mate’s posting. Each [weekly] participation will be awarded 0, 2, 3, or 5 points based on the indicators of the TD rubric. Four excellent participations, at 5 points each, can satisfied the 20 points.

6. Final Exam: This examination will cover readings, class notes, in-class activities, individual and group projects. Sample questions and format will be discussed in class and posted on the Blackboard prior the midterm evaluation. Like in the case of the online quizzes, you need to plan ahead so that you can complete this test in one attempt.

Mentoring a student for an upcoming science fair (Optional activity). This is an optional project worth 20 points, and they can be factored into the final test. That is, if you complete this optional task, you will take the final test for 30 points, instead of 50. In case you complete the mentoring project you will be expected to submit 3 short reports on the work you have done with a student. You are also expected to notify your instructor during Week 5 whether you will complete this optional activity. If you do not submit this [email] notification, you will take the final test for 50 points as described in this course syllabus.

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. 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 complete any assignment in this course.

Assignments will be submitted in the Assessment (in the case of quizzes) and 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 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.

**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”SALSO 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), 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.

**Equal Educational Opportunity**
In order to create equal educational opportunities in the class, all students are expected to demonstrate respect for the diverse voices and individual differences in the class. Particularly, no person shall be excluded from participation in, denied benefits of, or be subject to discrimination under any program or activity sponsored or conducted by the University of Texas at El Paso on the basis of race, color, national origin, religion, sex, age, veteran status, disability, or sexual orientation. Any member of the University community who engages in discrimination or other conduct in violation of University policy is subject to the full range of disciplinary action, up to and including separation from the University. Complaints regarding discrimination should be reported to the University’s Equal Opportunity Office. Inquiries regarding applicable policies should be addressed to the University’s Equal Opportunity Office, Kelly Hall, 3rd Floor, 915.747.5662 or eoaa@utep.edu

**Students with Disabilities Statement**
I will make any reasonable accommodations to meet students’ learning needs. Please contact me to discuss any special needs you might have. If you need specific accommodations please make sure to contact the Center for Accommodations and Support Services (CASS). The CASS office can be reached in the following ways:

- E-Mail: cass@utep.edu
- Web: http://www.utep.edu/dsso
- Phone: (915) 747-5148

The University of Texas at El Paso (UTEP) College of Education - Fall 2020
Inclusiveness and Equity
Learning happens only when we feel respected as a whole human being. My top priority in our course is to cultivate relationships of trust and respect and a sense that we see each other as whole, complex human beings. That you experience this in our class is important for the sake of your learning in our course and for the sake of your future students’ learning, so that you feel able to cultivate such relationships with them. To that end, I want you to know that all of you are welcome in our learning environment—all the parts of you as a person are welcome in our discussions, our activities, our assignments, and in our assessments. We are all complex people with a variety of perspectives, experiences, challenges, assets, and resources—our gender identities, our sexual orientations, our religions, our races, our ethnicities, our economic statuses, our immigration statuses, our parenthoods, our veteran statuses, our ages, our languages, our abilities and disabilities. All the parts of you are welcome in our learning community to the extent that you feel comfortable bringing them in. I strive to show respect for the variety and wholeness in each of you, and I expect that each of you shows respect for each other as well. If you feel marginalized in our class, and you feel comfortable discussing it, I would like to know so that I can support you, protect you, and make changes that feel more inclusive and equitable. You can also talk with our Department Chair and/or you can report a complaint of discrimination to the University’s Equal Opportunity Office, Kelly Hall, Third Floor, 915-747-5662 or eoaa@utep.edu.

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 unforeseen 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.

Reading Material: Readings will be assigned and available in Blackboard in the Home Page 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!
## Course Calendar

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments Due</th>
</tr>
</thead>
</table>
| 1    | Aug. 24-30 | . Introduction and overview  
. Who is a scientist? Part I  
. How students learn science?  
. Science probe  
**Activity 1:** My views about science education concept map  
Blackboard Collaborate Meeting  
*Thursday 5:00 – 6:30 pm* | Read the syllabus, and your *Student Profile* for and *Student Information* forms  
Submit the *Student Information form* by the end of the week (Find copy in Week’s 1 folder) |
| 2    | Aug. 31-Sept. 6 | . BirdSleuth Curriculum  
. Basic and integrated inquiry skills:  
  Popcorn activity  
  Impressionist Tales  
  Threaded Discussion 1  
  Course Module 1: The spirit of inquiry | Read:  
. Bell, Smetana & Binns: *Simplifying inquiry instruction*  
. Finson: *Inference vs. Observation*  
Submit this week your *student profile form* (Find a copy in Week’s 1 folder)  
**Quiz 1** |
| 3    | Sept. 7-13 | . Inquirize your teaching  
. Reviewing science education curricula  
. Science probe  
Course Module 2: Questions, variables, and hypotheses. | Read:  
. Scribner-MacLean: *More than just guessing*  
Submit Impressionist Tale  
**Quiz 2** |
| 4    | Sept. 14-20 | . BirdSleuth Curriculum  
. The Nature of science (NOS)  
. Science probe  
Course Module 3: The Nature of Science  
**Activity 2:** My Lesson Plan Part 1  
Threaded Discussion 2  
Blackboard Collaborate Meeting  
*Thursday 5:00 – 6:30 pm* | Read:  
. Crowther, Lederman, and Lederman: Understanding the true meaning of the nature of science |
| 5    | Sept. 21-27 | . BirdSleuth Curriculum  
. Practicing with the Art Elements: Communicating through Art  
Threaded Discussion 3 | Read:  
. Porter et al: *The art and science of notebooks* |
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Activity/Read</th>
</tr>
</thead>
</table>
| 6    | Sept. 28-Oct. 4 | - Teaching the language of science to ELLs  
- Measuring with toys  
- Interactive word walls  
**Activity 3: Inquiry investigation Part 1**  
Course Module 4: Science vocabulary  
Read:  
- Crowther et al: *Academic vocabulary instruction*  
Submit your philosophy illustration outline  
**Quiz 3** |
| 7    | Oct. 5-11   | - Basic and integrated inquiry skills:  
Observing, collecting data, predicting, and constructing graphs  
- Examining student work  
- BirdSleuth Curriculum  
- Bird survey around your house  
Threaded Discussion 4  
Course Module 5: Graphing skills  
Read: |
| 8    | Oct. 12-18  | - Outlining a **5E lesson plan**  
Course Module 6: The 5E Model  
**Activity 4: Science Activity Analysis**  
Threaded Discussion 5  
**Blackboard Collaborate Meeting**  
**Thursday 5:00 - 6:30 pm**  
- Bybee: *The 5E Model***  
**Quiz 4** |
| 9    | Oct. 19-25  | - Literature connections  
**Activity 5: My Lesson Plan Part 2**  
Read:  
- Munakata: *Lessons from the little prince***  
**Quiz 5** |
| 10   | Oct. 26-Nov. 1 | - Lesson Merit and STEM Activity presentation  
**Activity 6: Inquiry Activity Part 2**  
Submit your group’s lesson plan for peer review (One per group). |
| 11   | Nov. 2-8    | - Discussion on Lesson Planning  
**Activity 7: Science Activity Analysis** |
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Assignments/Activities</th>
<th>Read:</th>
</tr>
</thead>
</table>
| 12   | Nov. 9-15 | - Accommodating ELLs in the science classroom  
- Writing and speaking in science  
- Science Journaling  
Course Module 7: Accommodating ELLs in the science classroom. |  
- Gomez-Swiep, Straits, & Topps:  
5E for ELLs  
Submit review of lesson plan  
Quiz 6 |
| 13   | Nov. 16-22 | - Art and science grow together  
(Inquiry Project)  
Project 2 | |
| 14   | Nov. 23-29 | - Who is a scientist? Part II | Submit your science teaching philosophy illustration |
| 15   | Nov. 30-Dec. 3 | - Inquiry investigations: In class discussion and project presentations  
Activity 8: Inquiry Investigation Part 3  
Blackboard Collaborate Meeting  
Thursday 5:00 – 6:30 pm  
December 3 last day of classes | |
| 16   | Dec. 7-11 | Finals week (No class meeting) | Submit your group’s or individual lesson plan by Friday, December 11 at 5:00 pm.  
Take final exam on Blackboard this week between Monday (8:00 am) and Friday (5:00 pm) |

**References**


Writing impressionist tales as a strategy for facilitating prospective teachers’ reflections on science experiences. *Journal of Science Teacher Education, 16*, 227-239.


**Some Trade Books Used in this Course**


BED/ELED/MSED 4311: Teaching Science in the Dual Lang/Elem/Intermediate Gardees Classroom  
Fall 2020  
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) that your instructor should be informed.

________________________________________________________________________
________________________________________________________________________

If you experience any difficulties with the course—please do not wait, contact the instructor as soon as possible—email, phone, or in-person meeting.

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

_________________________________  _________________________
Student Signature                      Date
BED/ELED/MSED 4311: Teaching Science in the Dual Lang./Elem/Intermediate Grades – Fall 2020
Student Information Form

- Name: ___________________________ Preferred Name: ______________

- Major:

- Hobbies and interests

- Science courses you have taken in college

- Your favorite subjects
  A. In elementary School
  B. In high school:
  C. In college:

- Please share your views on the following cases.

  Do you have/are responsible for a school-aged child at home this semester?

  Please, describe briefly your experience/es with science and whether they were positive or negative.

  At this stage of your teacher preparation program, would you be able to deliver a [science] lesson? Yes/No? Why?

- Please, provide a definition of the following terms.
  A. Science:
  B. STEM:

- Indicate on the scale below your knowledge of and previous experience with lesson planning:

<table>
<thead>
<tr>
<th>Minimal</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Extensive</th>
<th>10</th>
</tr>
</thead>
</table>
# Assignment Rubrics

## Growth Essay 1: My Impressionist Tale

<table>
<thead>
<tr>
<th>Component</th>
<th>10</th>
<th>5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td>• The essay is 1-page (double-spaced) long.</td>
<td>• The essay is 1 – ½ pages (double-spaced) long.</td>
<td>• The essay is &gt;1 – ½ pages (double-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>[Paragraph 1]</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>Critical Emotions</strong></td>
<td>• Identifies emotions and feelings (positive/negative) associated with the learning episode.</td>
<td>• Provides a list of emotions and feelings (positive/negative).</td>
<td>• Provides a list of emotions and feelings (positive/negative).</td>
</tr>
<tr>
<td>[Paragraph 2]</td>
<td>• Answers the 2-part question.</td>
<td>• Answers the 2-part question in a general manner.</td>
<td>• Provides a general answer to the 2-part question; includes an incorrect/unrelated citation.</td>
</tr>
<tr>
<td></td>
<td>• Cites correctly at least one publication dealing with the concept of emotions; the citation clearly supports a statement of claim.</td>
<td>• Incorrect citation; unclear relationship between the citation and the point being made.</td>
<td></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>
</tbody>
</table>
Science Teaching Philosophy Illustration (20 pts)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. One-page Outline (5pts)</strong></td>
<td></td>
</tr>
<tr>
<td>What: identifies the science teaching and learning components</td>
<td></td>
</tr>
<tr>
<td>How: Identifies the medium and art elements to be used in the representation of components; describes the procedure to be employed in the illustration.</td>
<td></td>
</tr>
<tr>
<td><strong>2. Final Submission (15 pts)</strong></td>
<td></td>
</tr>
<tr>
<td>Punctual submission and introduction. Each presenter will write and share a 50-word ‘artist statement’ with peers in the virtual poster presentation.</td>
<td></td>
</tr>
<tr>
<td>The artist statement incorporates science education terminology (e.g., inquiry learning, hypothesis, misconceptions); it is also personal (uses the ‘I’ instead of the third person).</td>
<td></td>
</tr>
<tr>
<td>The 1-page (8.5”x11”) visual illustration clearly utilizes the art elements cited in the statement. The viewer can easily see the main science teaching philosophy components in the illustration as conveyed by the art elements.</td>
<td></td>
</tr>
<tr>
<td><strong>5E Lesson Plan</strong></td>
<td><strong>10-7 pts</strong></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Lesson source, title &amp; Connection with Food Pedagogy</strong></td>
<td>- The lesson indicates whether the content is adapted from an existing curriculum, from a classroom teacher, or information source. Credit should be given to the original author/s (Citel) - The title is intriguing, succinct and represents the lesson plan - The lesson clearly builds on a food-related topic that allows the students to contribute to their own learning.</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>
</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. The lesson clearly addresses the principles of the Socio Transformative Constructivism learning theory.</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). - Vocabulary of the lesson is identified/listed (i.e., Tier 1, Tier 2, and Tier 3 words).</td>
</tr>
<tr>
<td>Lesson Body</td>
<td>30-20 pts</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>- Lesson includes at least one assessment strategy focused exclusively on the scientific terminology students encountered in the lesson.</td>
<td>- General 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>
</tr>
<tr>
<td>- Exploration: desbes a STEM-based activity/strategy that encourages students to work together in the solution to the posed problem or challenge; students imagine, plan, test, and improve their designs; students formulate predictions and record observations and most importantly use the Engineering by Design process (EbD).</td>
<td>- Exploration: describes an activity that although builds on the EbD process seems unrelated to the previous phase; although students are encouraged to work together they there is no evidence that the students will imagine, plan, test, and improve a design; students practice a few inquiry skills only (e.g., test predictions).</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>
</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>
</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>
</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>
<td></td>
</tr>
</tbody>
</table>

Comments
### Link to TExES Competencies (Science domain)

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.

<table>
<thead>
<tr>
<th>Competency: Safe and proper laboratory processes.</th>
<th>These standards will be addressed and/or assessed with the following course activities and assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>The beginning teacher:</td>
<td>5E Lesson plan</td>
</tr>
<tr>
<td>D. Selects and safely uses appropriate tools, technologies, materials for instructional activities</td>
<td>Inquiry investigation (Parts II, and III)</td>
</tr>
<tr>
<td>E. Understands concepts of precision, accuracy and error with regard to reading and recording numerical data from a scientific instrument</td>
<td>Bird survey</td>
</tr>
<tr>
<td>F. Understands how to gather, organize, display and communicate data in a variety of ways (e.g., charts, tables, graphs, diagrams, written reports, oral presentations)</td>
<td>Popcorn activity</td>
</tr>
<tr>
<td>G. Understands the international system of measurement (i.e., metric system)</td>
<td>Inquiry activities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Competency: Scientific inquiry</th>
<th>5E STEM lesson plan, final test, impressionist tale, and readings from week 2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The beginning teacher:</td>
<td></td>
</tr>
<tr>
<td>A. Understands plans and implements instruction that provides opportunities for all students to engage in non-experimental- and experimental-inquiry investigations</td>
<td>Inquiry investigation (Part I), online quizzes</td>
</tr>
<tr>
<td>B. Focuses inquiry-based instruction on questions and issues relevant to students and uses strategies to assist students with generating, refining and focusing scientific questions and hypotheses</td>
<td>Inquiry investigation (II &amp; III) and 5E Lesson</td>
</tr>
<tr>
<td>D. Knows how to guide students in making systematic observations and measurements</td>
<td>Popcorn activity, inquiry activities, bird survey, activities 3, 6 and 9.</td>
</tr>
<tr>
<td>E. Knows how to promote the use of critical-thinking skills, logical reasoning and scientific problem solving to reach conclusions based on evidence</td>
<td>Inquiry investigation (I. II, &amp; III)</td>
</tr>
<tr>
<td>F. Knows how to teach students to develop, analyze and evaluate different explanations for a given scientific result</td>
<td>Quizzes, and reading from week 4</td>
</tr>
<tr>
<td>G. Knows how to teach students to demonstrate an understanding of potential sources of error in inquiry-based investigation</td>
<td></td>
</tr>
<tr>
<td>H. Knows how to teach students to demonstrate an understanding of how to communicate and defend the results of an inquiry-based investigation</td>
<td></td>
</tr>
<tr>
<td>J. Understands the roles that logical reasoning, verifiable evidence, prediction and peer review play in the process of generating and evaluating scientific knowledge</td>
<td></td>
</tr>
<tr>
<td>K. Understands the historical development of science and the contributions that diverse cultures and individuals of both genders have made to scientific knowledge</td>
<td></td>
</tr>
</tbody>
</table>
### 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.
- Final test and quizzes
- Final test and quizzes

### 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.
- Inquiry investigation (Parts II and III)
- Activities, readings from week 2
- Inquiry investigation
- Inquiry investigation

### 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.
- 5E STEM lesson (peer review, final draft, and delivery), final test, quizzes, discussions, course activities, and reflection on science teaching views.
### 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.

- Readings from weeks 6 and 8, 5E STEM lesson plan (design and review), and final test.

### Competency: Life science

The beginning teacher:

A. Understands that living systems have different structures that perform different functions.

B. Understands and describes stages in the life cycles of common plants and animals.

C. Understands that organisms have basic needs.

- Inquiry investigation (I, II, and III)