

SIED 5325: Inquiry Science Education in Bilingual Settings (CRN 22467) Course Syllabus

Contact Information

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Office Hours: Tuesday and Wednesday 12:00 – 2:00 pm

Please email me within the Blackboard email system to set up an appointment or to arrange a phone conversation.

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.

Course Description

This course provides a review of pedagogical content knowledge (PCK) methodologies as implemented in K-12 learning settings with emphasis on English Language Learners (ELLs) in school classrooms. This course also offers a review of (1) the historical aspects of scientific inquiry as an instructional methodology in K-12 learning settings, and of (2) science education from a multicultural viewpoint aimed to support both content and language development in bilingual school communities. Students will learn to develop curriculum using the Texas Essential Knowledge and Skills (TEKS), the Next Generation Science Standards (NGSS), the instructional models such as sheltered instruction, and the 5E Instructional Model. In this course, students will participate as a teacher, researcher, and student while they reflect on how a student-centered learning setting can transform their classroom activities benefiting ELLs. The course is organized around lecture notes, video-lessons, threaded discussions, readings, written projects, and use of sheltered instruction. Grades are derived from participation and a mastery of basic concepts as indicated by group and individual projects, and student reading and writing exercises. The class includes research-based principles in science learning and second language acquisition.

Course Procedures

This class is a graduate class in science education, and it is expected that students manage their time and complete all the required classroom material. The class will be facilitated in Blackboard through the University of Texas at El Paso and can be accessed through the My UTEP 3.0 Web Site (<http://my.utep.edu>) and will be conducted as an online class. All class interactions will be done online and all materials for the semester will be delivered and received in Blackboard. Be sure to read all the lecture note materials thoroughly and to continually consult the course schedule in order to keep up on all information associated with this online class.

There will be weekly class notes that will be posted no later than Monday morning of each week throughout the semester. The weekly class notes will appear as a link in the Course Content section of our class in Blackboard. It is the responsibility of each student to follow

this material and integrate it into your individual class material assignments.

You will need to examine and understand the environment of this class in Blackboard and the location of all class material. It is recommended that you log in with great regularity in Blackboard to look for announcements, lecture notes, discussion posts, description of course assignments, anticipation guides, email tools, and spaces for collaboration.

Required Textbook

Carr, J., Sexton, U. & Lagunoff, R. (2007). Making science accessible to English learners. San Francisco: WestEd.

Other required readings will be available in Blackboard in PDF format. The Adobe Acrobat reader is free and may be obtained at: www.adobe.com. These readings are posted in the 'Additional Readings' folder in the Course Content area.

Suggested Online Sources

- Center for Applied Linguistics: <http://www.cal.org/>
- Institute for Inquiry: <http://www.exploratorium.edu/ifi/>
- Jim Cummins' website: <http://iteachilearn.org/cummins/>
- National Association of Bilingual Education (NABE) Journal of Research and Practice: <http://www.uc.edu/njrp>
- National Clearinghouse for English Language Acquisition and Language Instruction and Educational Programs: <http://www.ncela.gwu.edu/>
- Stephen Krashen's website: <http://sdrashen.com/>
- The New Generation Science Standards (NGSS)
www.nextgenscience.org/next-generation-science-standards.

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.

Technical Assistance

The University of Texas at El Paso offers complete technical information and help desk support at: <http://issweb.utep.edu/techsupport/>.

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 (*Lecture 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 Course Content area.

Course Goals

Successful completion of this class will assist graduate students in meeting the following goals:

1. To engage in class discussions and assignments that require the integration of skills in content development and content delivery in ELLs' classrooms.
2. To apply knowledge of, and guides students to understand the processes of scientific inquiry and the role of inquiry in the teaching of science in culturally and linguistically diverse classrooms.
3. To identify and integrate ELLs' personal experiences and family backgrounds, relevant to science with academic content.
4. To implement a variety of instructional strategies and resources to meet the diverse needs of all learners in science classrooms.
5. To identify and articulate standard-based science instructional strategies by making research-based decisions, exhibiting leadership, and consulting with colleagues in your field.
6. To analyze and synthesize an understanding of course material in both classroom and online environments through multiple classroom interaction strategies.

Student Learning Outcomes

It is expected that by the end of the course, the successful graduate student will be able to:

1. Discuss differences in first and second language acquisition.
2. Identify principles of second language acquisition in classroom settings.
3. Outline strategies for modifying science lessons to accommodate English language learners.
4. Demonstrate proficiency in the use of the 5E Instructional Model as a resource for lesson planning.
5. Apply knowledge of, and guide students to understand and practice the processes of scientific inquiry and the role of inquiry in science learning and teaching.
6. Become proficient in the curriculum alignment process.
7. Address the TEKS and NGSS for appropriate grade level.

8. Use the discourse of our discipline (science education) in a writing project to address issues that are of interest to the teaching and learning of science with ELLs.

Assessment of Student Learning Outcomes

Assignment	Assessment of learning outcomes
1. Growth Essays	Learning outcomes: 1, 2, 7 and 8.
2. 5E Lesson Plan	Learning outcomes: 1, 2, 4, 5, 6, 7, and 8.
3. Points of Most Significance (POMS)	Learning outcomes: 1, 2, and 7, and 8.
4. Threaded Discussions	Learning outcomes: 1, 2, 3, and 7, and 8.

Outline Activities – Due Dates Spring 2019

Assignment	Date Open	Due Date—Closed
<i>Growth Essays (IA)</i> - Growth essay 1 - Annotated bibliography - Growth essay 2	Feb. 17 at 7:00 AM Mar. 23 at 7:00 AM May 4 at 7:00 AM	Feb. 23 at 11:55 PM Mar. 29 at 11:55 PM May 15 at 5:00 PM
<i>5E Science Lesson Plan (IA or GA)</i> - Lesson Outline - 5E lesson submission for peer review - Lesson final submission	Feb. 24 at 7:00 AM April 6 at 7:00 AM May 4 at 7:00 AM	Mar. 1 at 11:55 PM April 12 at 11:55 PM May 15 at 5:00 PM
<i>Points of Most Significance (POMS) (IA)</i> <i>(You are expected to complete 4 submissions)</i> POMS introduction..... POMS sample 1(<i>no points earned</i>)..... POMS sample 2 (<i>no points earned</i>) POMS 1..... POMS 2 POMS 3 POMS 4 POMS 5	Jan. 21 Jan. 27 at 7:00 AM Feb. 3 at 7:00 AM Feb. 10 at 7:00 AM Feb. 17 at 7:00 AM Feb. 24 at 7:00 AM Mar. 2 at 7:00 AM Mar. 9 at 7:00 AM	Jan. 26 Feb. 2 at 11:55 PM Feb. 9 at 11:55 PM Feb. 16 at 11:55 PM Feb. 23 at 11:55 PM Mar. 1 at 11:55 PM Mar. 8 at 11:55 PM Mar. 15 at 11:55 PM
<i>Threaded Discussion (TD) (IA)</i> Threaded Discussion 1 Threaded Discussion 2 Threaded Discussion 3	Mar. 9 at 7:00 AM Mar. 30 at 7:00 AM Apr. 13 at 7:00 AM	Mar. 15 at 11:55 PM Apr. 5 at 11:55 PM Apr. 19 at 11:55 PM

GA: group assignment

IA: Individual assignment

We will use Blackboard email to clarify readings and questions regarding assignments. Please make your questions and clarification requests available for all students and I will share answers with all via Help Board 'Frequently Asked Questions (FAQ).'

Guidelines

- **Dates Due – Open:** Means that a discussion or written assignment link is available.
- **Dates Due – Closed:** Means that a discussion or written assignment link is closed and no longer available.
- **It is important to pay attention to all due dates and to manage your time and meet the requirements of this online graduate class as outlined in the course syllabus.**

Grading Criteria

The course will be assessed based on the following criteria:

Assignment	Total Points
<i>Growth Essays and Annotated Bibliography (IA)</i> -Essay 1 (20 points) -Annotated Bibliography (20points) -Essay 2 (60points)	100 points
<i>5E Science Lesson (IA/GA)</i> -Lesson Outline (20 points) - Final submission (80 points)	100 points
<i>POMS (IA)</i> . You are required to submit 4 POMS	20* points
<i>Threaded Discussions (IA)</i>	15 points
Total	235 points

**This score depends on the POMS type you use in your submissions. For instance, perfect scores on four type III POMS submissions will result in 20 points (Type I= 3 pts; Type II= 4 pts; Type III= 5 pts). In case you participate in the five submissions; your instructor will use the best four POMS scores in the calculation of your grade for this 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 Assignments (See assignment rubrics at the end of the syllabus and also in the Rubrics Folder in the Course Content area of Blackboard)

Growth Essays: In this assignment you are required to demonstrate the ability to:

- Use the discourse of our discipline (*science education*) and communicate that field's subject matter to academic and/or professional audiences.
- Make effective use of multiple drafts, of revision and editing, of computer technology, of peer and instructor comments, and of collaboration in the achievement of writing that shows understanding of written standards in a discipline and/or interdisciplinary field.
- Address issues that are of interest to you in the teaching and learning of science with ELLs and complete a substantial writing project that requires appropriate research skills.

- Observe the conventions of spelling, grammar, structure, punctuation, and documentation expected in disciplinary, interdisciplinary, and/or professional contexts.

Growth Essay 1: 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 college days 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). 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. CEP is defined as the implementation of “strategies for evoking and responding to the variety of emotions students may display as a result of critically engaging with specific subject matter topics” (Rodriguez, 2017, p. 265). By learning our own history, hopefully we can become more conscious of those beliefs and attitudes.

Growth Essay 2: My Current Views about Teaching and Learning Science in English

This is an 8-page (double-spaced, not including References) essay based on (a) your initial meeting with your student/s (ELL/s), and (b) the delivery of the lesson activity. This essay:

- *States* your current views about science education (the teaching and learning of science) in linguistically diverse settings, and the impact of those views on your lesson design and delivery.
- *Briefly addresses* the learning experience described in essay 1.
- *Describes* the science/education and second language acquisition concepts you practiced in the initial meeting with your ELL/ELLs and while delivering the lesson activity.
- *Shows* what you think ELLs needed in terms of linguistic assistance in the science classroom.
- *Lists* and discusses your lesson plan decisions based on the initial meeting with your student/s (ELL).
- *Uses* at least five relevant citations (from your annotated bibliography) in the discussion of those decisions. These citations should deal with the target topic.
- *Presents* your reflection on the teaching experience with your ELL/ELLs.

Samples of these essays will be available in the Course Content area of Blackboard.

Annotated Bibliography: The bibliography will be integrated into your Growth Essay 2 and should contain an entry for each document you have found useful for your essay. This submission should include at least five entries. The entry will consist of two parts:

1. A citation in APA Style for the document.
2. An annotation consisting of a brief (~100 word) descriptive and evaluative paragraph.

The purpose of the annotation is to:

- A. Summarize the findings or key points of the document.
- B. Evaluate the document. The evaluation might include, but is not limited to, a discussion of these points:
 - *Date*—is the work current? If not, how does the age of the document impact the relevance, accuracy, or scope of the information contained in the document?
 - *Contribution*—explain how this work illuminates your bibliography topic. Has it changed how you think about your project?

The writing assignment must follow the APA style format. APA resources are available online (see <http://www.apastyle.org/faqs.html>) as are tools to aid in creating bibliographies (See <http://citationmachine.net/>). If you are already familiar with the 5th edition, visit the following website for a summary of changes in the 6th edition. <http://www.apastyle.org/manual/whats-new.aspx>

The essays submitted in class must pass the expected level of originality and will be checked using the www.turnitin.com service.

5E Lesson Plan: The 5E lesson assignment (No more than 3 students per group/or individually) should be appropriate for the classroom in which you teach or would like to teach. As part of this assignment you will interact with a group of ELLs. This course project consists of: (1) A lesson outline, (2) a peer-review of a lesson plan assigned by the instructor, and (3) the improvement of your own lesson based on the feedback received from reviewers. Your lesson plan should identify a language proficiency level.

Points of Most Significance (POMS): Adapted from McComas (2002), POMS submissions are based on *[only] one* assigned reading from each week, and represent what you think are the most important points made by the author/s of a given paper. This strategy will help you get the most out of the assigned readings and be ready to contribute to class discussions and writing assignments. Each POMS will be based on (1) a single reading and (2) on one POMS type (Summary, Synthesis or Application). Note that you are expected to submit four POMS statements throughout the semester. If you decide to participate in each of the five opportunities, your instructor will use the best four scores in the calculation of your grade for this assignment.

There are three POMS types, each with its unique point value.

- *I- Summary:* Reflects major idea(s) of a paper, or set of papers, within the current reading

topic (3 pts).

- *II-Synthesis*: States how you think the major idea(s) of a current reading or set of readings relate to the major idea(s) discussed in previous readings or class meetings (4 pts).
- *III-Application*: States a major implication for science teaching and learning in linguistically diverse classrooms (*not* directly provided by the author) that you draw from a given reading and discuss the means by which the implication can be put into practice (5 points).

POMS' Rules

Rule 1: Each individual POMS statement is to be no more than 55 words long.

Rule 2: For each POMS, indicate the type (I: Summary, II: Synthesis or III: Application) you intended to write.

Rule 3: Include in the POMS the title of the reading and its author/s. (This information will not be counted for the 55 words maximum).

Rule 4: POMS should be submitted by the assigned week (no later than Sunday at midnight) on the course platform only (Blackboard Assignment section). Include your name and the reading related to the POMS. Please contact me *right away* if you have problems submitting your POMS on Blackboard.

Rule 5: ALL POMS (except sample 1) *must* include a reference to AT LEAST ONE of the readings from previous weeks that support or refute a position with which you would like to draw comparisons or conclusions.

Rule 6: Four points will be lost with each non-submitted POMS. You are expected to submit four.

We will practice writing POMS during weeks 2 and 3 (See course schedule). These submissions [POMS samples] will not be graded but you will receive feedback. They are submitted for practice purposes only.

Here is an example of a POMS submission:

	Week 4 Type II	Week 5 Type II	Week 6 Type III	Week 7 Type II	Week 9 Type III	Total Points
Points earned	3.0/4.0 pts	3.0/4.0	4.0/5.0	2.0/4.0	4.5/5.0	14.5/18

Best four scores

Threaded Discussion on Blackboard: There will be four Threaded Discussion (TD) prompts available (see course calendar), each posted on Monday morning by 7:00 AM and open until Sunday at 11:55 PM. Each contribution will be awarded 0, 2, 3, or 5 points based on the complexity and thoughtfulness of your comments. For example, 3 excellent participations at 5 points each can satisfy the entire 15 total points.

Do not post your responses to the discussion board as attachments! Please type directly or copy and paste the text into the discussion boards.

Academic Policies

Attendance Policy: Attendance is taken by monitoring your work and participation online. You are responsible for doing all the work and reviewing the online lectures every week. The instructor

reserves the right to drop students from the course who have not participated during two weeks of classes.

Assignment Submission: Your assignments are due 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. Assignments not turned in will receive a grade of zero. I will only agree to grade late work for the first week following the due date, and 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. Create your time management plan and stick to it, so you can get everything done on time.

Make-up Work: There are no make-up assignments unless in case of serious bodily harm or death in family. You must bring a document issued by a health service provider or institution in order to turn in late work or make up an exam.

Assigned Reading Materials: Readings will be assigned for each week. You will be responsible for reading and understanding these materials.

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 only during the term and if a student provides evidence of a documented illness or family crisis that precludes successful completion of the course.

Students with Disabilities: I will make any reasonable accommodations for students with limitations due to disabilities, including learning disabilities. Please contact me to discuss any special needs you might have. If you have a documented disability and require specific accommodations, you will need to contact the Disabled Student Services Office in the East Union Bldg., Room 106 within the first two weeks of classes. The Disabled Student Services Office can also be reached in the following ways:

E-mail: dss@utep.edu

Web: <http://www.utep.edu/dsso>

Phone: (915) 747-5148

Fax: (915) 747-8712

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 classroom 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 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.

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 ARE 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.
- More information on Netiquette can be found at: www.albion.com/netiquette.
- Think before you push the "Send" button. During group discussions, did you clearly say what you meant to say? How will the person on the other end read the words? While you can't anticipate all reactions, do read over what you have written before you send it.

Course Calendar

Week	Date	Topic/Activity	Assignments Due
Part I: Inquiry and Language Learning			
1	Jan. 21-26	<ul style="list-style-type: none"> Syllabus review: Read the course syllabus and list of activities and assignments. Please, contact me with questions you may have about the content of the course syllabus. <p>Read the class notes for each week (except week 1). Find them in the <i>Class Notes</i> folder.</p> <ul style="list-style-type: none"> Be reminded that announcements will be posted on a weekly basis and when clarifications are needed. A Q&A folder is also available in the Course Content area. 	<ul style="list-style-type: none"> Introductions (in the <i>Discussion</i> section of the navigation menu) <p>Submit via Blackboard Assignments and by the end of week 1 <i>the Student information forms</i>. These forms are available in the Course Content Area (<i>No points earned</i>).</p> <ul style="list-style-type: none"> POMS introduction
2	Jan. 27-Feb. 2	<ul style="list-style-type: none"> Principles of Scientific Inquiry <p>Check Assignment instructions in the Content area. Contact your instructor with questions, comments, or suggestions.</p>	<p>Read:</p> <ul style="list-style-type: none"> Bell, Smetana, & Binns: <i>Simplifying inquiry instruction</i>. Bybee: <i>Scientific inquiry and science teaching</i>. <p>POMS sample 1 (no points earned). Write your POMS on [only] one reading from this week.</p>
3	Feb. 3-9	<ul style="list-style-type: none"> The academic language of science Who are English language learners and why is it important to design instruction specifically for them? 	<p>Read:</p> <ul style="list-style-type: none"> Stoddart, Pinar, Latzke, & Canaday: <i>Integrating inquiry science and language development</i>. McLaughlin: <i>Myths and misconceptions about second language learning</i>. Rodriguez & Ramos: <i>Conversation with Krashen</i>. NCTE: <i>English Language Learners</i> <p>POMS sample 2 (no points earned) Choose one reading from this week to write your POMS statement.</p>

4	Feb. 10-16	<ul style="list-style-type: none"> • The Nature of Science (NOS) • Critiquing inquiry projects • Next Generation Science Standards 	<p>Read:</p> <ul style="list-style-type: none"> • McComas: <i>Keys to teach the nature of science.</i> • Colburn: <i>Defining science</i> <p>Submit POMS 1 based on one reading from this week.</p>
5	Feb. 17-23	<ul style="list-style-type: none"> • The 5E Learning Cycle • Choose one reading on emotions to cite Essay 1, 2nd paragraph 	<p>Read:</p> <ul style="list-style-type: none"> • Carr, Sexton, & Lagunoff, Ch. 1 • Bybee: <i>The 5E Instructional Model</i> • One reading on emotions (Rivera Maulucci, 2013; Siry & Brendel, 2016; Rodriguez, 2017) <p>Submit POMS 2 based on one reading from this week. Submit Growth Essay 1</p>
6	Feb. 24-Mar. 1	<ul style="list-style-type: none"> • Exploring language in the context of content. 	<p>Read:</p> <ul style="list-style-type: none"> • Carr, Sexton, & Lagunoff, Ch. 3 • Cummins: <i>BICS and CALP</i> • Bautista: <i>Leveling up</i> <p>Submit POMS 3 based on one reading from this week. Submit Lesson Outline (one per group or individually)</p>
7	Mar. 2-Mar. 8	<ul style="list-style-type: none"> • The language of science • 5E lesson samples • Continue with the design of your 5E lesson for the multicultural classroom. 	<p>Read:</p> <ul style="list-style-type: none"> • Crowther et al: <i>Academic vocabulary instruction within inquiry science.</i> • McCall: <i>Frontloading for ELLs.</i> • Carr, Sexton, & Lagunoff, Ch. 4 <p>Submit POMS 4 based on one reading from this week.</p>

Part II: Sheltered Instruction			
8	Mar. 9-15	<ul style="list-style-type: none"> The SIOP Model 	Read: <ul style="list-style-type: none"> Short, Vogt & Echeverria Ch. 2 & 3 Submit POMS 5 based on one reading from this week. <ul style="list-style-type: none"> Threaded Discussion 1
9	Mar. 16-22	<i>Spring Break</i> No class activity this week	
10	Mar. 23-29	<ul style="list-style-type: none"> Multicultural science education <i>Resources:</i> -Read Gallard's paper at: http://www.narst.org/publications/research/multicultural.cfm -Cultural Inquiry Process http://classweb.gmu.edu/cip/r/r-ind.htm	Read: <ul style="list-style-type: none"> Gallard: <i>Creating a multicultural learning environment in science classrooms.</i> Meyer Monhardt: <i>Fair play in science education</i> Carlone & Smithery: <i>Creating a "We" culture.</i> Submit Annotated Bibliography
Part III: Academic Writing and Lesson Revision			
11	Mar. 30 Apr. 5	<ul style="list-style-type: none"> Assessment strategies 	Read: <ul style="list-style-type: none"> Carr, Sexton, & Lagunoff, Ch. 6 Armon & Morris: <i>Integrated assessment for ELLs.</i> Threaded Discussion 2
12	Apr. 6-12	<ul style="list-style-type: none"> Collaborative activity: Sharing of lesson and writing projects. 	APA Resources for academic writing at the OWL (Purdue): http://owl.english.purdue.edu/owl/resource/560/01/ Submit 5E Lesson for peer review
13	Apr. 13-19	<ul style="list-style-type: none"> Strategies for planning and teaching 	Read: <ul style="list-style-type: none"> Carr, Sexton, & Lagunoff, Ch. 5 & 7 Threaded Discussion 3

14	Apr. 20-26	<ul style="list-style-type: none"> Tools for the duallanguage classroom. 	<p>Read:</p> <ul style="list-style-type: none"> Dong: <i>Powerful tools for ELLs</i> Quinn, Lee & Valdés: <i>Language demands and opportunities in relation to the NGSS for ELLs</i> Thretter, Ardasheva & Bookstrom: <i>A brick and mortar approach</i> Bautista: <i>Teaching science to ELLs, Part I and Part II</i> <p>Submit your revision of the 5E lesson with comments</p>
15	Apr. 27– May 3	<ul style="list-style-type: none"> Developing final projects: Science lessons and academic writing projects. 	Continue working on your final projects.
16	May 4- 7	<p>Final projects finalized and delivered</p> <p><i>May 7 last day of classes.</i></p> <p>Finals Week: May 11-15</p>	Submit 5E Lesson (final draft) and Growth Essay 2 by May 15 at 5:00 pm

Reading List

- Armon, J., & Morris, L. (2008) Integrating Assessments for ELL. *Science & Children*, 45(8), 49-53.
- Bell, R. L. Smetana, L. & Binns, I. (2005). Simplifying inquiry instruction: Assessing the inquiry level of classroom activities. *The Science Teacher*, 72(7), 30-33.
- Bautista, N., & Castañeda, M. (2011). Teaching science to ELLs, Part I and Part II. *The Science Teacher*, 78(3), 35-39
- Bautista, N. (2014). Leveling up: Addressing ELLs' language proficiency and cognitive abilities in science classrooms. *The Science Teacher*, 81(4), 32-37.
- Bryan, L. A., & Tippins, D. J. (2005). The Monets, Van Goghs, and Renoirs of science education: Writing impressionist tales as a strategy for facilitating prospective teachers' reflections on science experiences. *Journal of Science Teacher Education*, 16, 227-239.
- Bybee, R. W. (2004). Scientific inquiry and science teaching. In L. B. Flick and N. G. Lederman (eds.). *Scientific inquiry and nature of science*. Springer. The Netherlands.
- Bybee, R. W. (2014). The 5E instructional model: Personal reflections and contemporary implications. *Science & Children*, 51(8), 10-13.
- Carlone, H., & Smithery, D. (2014). Creating a "We" culture: Strategies to ensure all

- students connect with science. *Science & Children*, 52(3), 66-71.
9. Colburn, A. (2007). Defining science. *The Science Teacher*, 74(6), 12-13.
 10. Crowther, D. T., Tibbs, E., Wallstrum, R., Storke, E., & Leonis, B. (2011). Academic vocabulary instruction within inquiry science: The Blended/Tiered approach. *AccELerate!* 3(4), 17-20.
 11. Cummins, J. (1999). BICS and CALP: Clarifying the distinction. ERIC/REC Clearinghouse.
 12. Dong, Y. R. (2013). Powerful learning tools for ELLs. *The Science Teacher*, 80(4): 51-57.
 13. Gallard, A. J. (2003). *Creating a Multicultural Learning Environment in Science Classrooms: Research Matters*. National Association for Research in Science Teaching.
 14. McComas, W. (2004). Key ideas to teach about the nature of science. *The Science Teacher*, 24-27.
 15. McCall, J. (2005). Frontloading for ELL learners: Building concepts and vocabulary before reading. Retrieved from www.literacyspecialists.com on 12/05/2012.
 16. McLaughlin, B. (1992). Myths and misconceptions about second language learning: What every teacher needs to unlearn. Educational Practice Report No. 5.
 17. McComas, W. (2002). A thematic introduction to the nature of science: The rational and content of a course for science educators. Kluwer Academic Publisher. Dordrecht, The Netherlands.
 18. Meyer Monhardt, R. (2000). Fair play in science education: Equal opportunities for minority students. *The Clearing House*, 74(1), 18-22.
 19. Moscovici, H., & Homlund Nelson, T. (1998). Shifting from activitymania to inquiry. *Science & Children*, 14-40.
 20. Quinn, H., Lee, O. & Valdés, G. (2012). *Language demands and opportunities in relation to Next Generation Science Standards for English language learners: What science teachers need to know*. Stanford, CA: Stanford University, Understanding Language Initiative.
 21. Rivera Maulucci, M. S. (2013). Emotions and positional identity in becoming a social justice science teacher: Nicole's story. *Journal of Research in Science Teaching*, 50(4), 453-478.
 22. Rodriguez, A. J. (2017). How do teachers prepare for and respond to students' evoked emotions when addressing real social inequalities through engineering activities? *Theory into Practice*, 56, 263-270.
 23. Siry, C., & Brendel, M. (2016). The inseparable role of emotions in the teaching and learning of primary school science. *Cultural Studies of Science Education*, 11, 803-815
 24. Stoddart, T., Pinal, A., Latzke, M., & Canaday, D. (2002). Integrating inquiry science and language development for English language learners. *Journal of Research in Science Teaching*, 39(8), 664-687.
 25. Tretter, T., Ardasheva, Y. & Bookstrom, E. (2014). A brick and mortar approach: Scaffolding use of specific science language structures for first-year English language learners. *The Science Teacher*, 81(4), 39-44.
 26. Van Maanen, J. (1988). *Tales of the field: On writing ethnography*. Chicago: University of Chicago Press.

Growth Essay 1: Impressionist Tale

Component	20 -----15	14-----7	6-----1
Length	<ul style="list-style-type: none"> The essay is 1-page (single-spaced) long. 	<ul style="list-style-type: none"> The essay is 1 – ½ pages (single-spaced) long. 	<ul style="list-style-type: none"> The essay is >1 – ½ pages (single-spaced) long.
One science learning episode <i>[Paragraph 1]</i>	<ul style="list-style-type: none"> Addresses <u>one</u> meaningful science learning experience Identifies time and location Describes in detail the episode Identifies the participants of the episode. Draws the reader into the episode being described and uses evocative language that reflects what the writer feels about the topic. 	<ul style="list-style-type: none"> Addresses one science learning episode but fails to highlight its relevance Identifies either time or space Partial description of the learning episode Identifies the participants of the episode 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. 	<ul style="list-style-type: none"> Addresses more than one science learning episode Missed to identify time and location Vague description of the episode Identifies only the main protagonist of the episode Does not draw the reader into to the episode; the use of evocative language is minimal.
Critical Emotions <i>[Paragraph 2]</i>	<ul style="list-style-type: none"> Identifies emotions and feelings (positive/negative) associated with the learning episode. Answers the 2-part question Cites [correctly] at least one publication dealing with the concept of emotions; the citation clearly supports a statement of claim 	<ul style="list-style-type: none"> Provides a list of emotions and feelings (positive/negative) Answers the 2-part question in a general manner. Incorrect citation; unclear relationship between the citation and the point being made 	<ul style="list-style-type: none"> Provides a list of emotions and feelings (positive/negative) Provides a general answer to the 2-part question; includes an incorrect/unrelated citation

Annotated Bibliography (20 pts)

Score	20 -----15	14-----10	9-----1
Annotated Bibliography	<ul style="list-style-type: none"> • Contains at least 5* entries (100 words) or evaluative paragraphs (one per publication). Publications are peer-reviewed (academic/research journals). • Each entry evaluates the quality of the source in terms of its currency, relevance, and accuracy; it also explains how the publication adds or relates to the ideas addressed in the essay. • Includes a reference list (APA style) <p><i>*At least 3 from your own search.</i></p>	<ul style="list-style-type: none"> • Contains 3-4 entries (100 words) or evaluative paragraphs (one per publication). Some publications are peer-reviewed (academic/research journals). • Each entry evaluates the quality of the source in terms of its currency, relevance, and accuracy; fails to explain how the publication adds or relates to the ideas addressed in the essay. • Minor issues with the citation style (APA style) 	<ul style="list-style-type: none"> • Contains 1-2 entries (100 words) or evaluative paragraphs (one per publication). Only one publication is peer-reviewed. • Entries simply list facts taken directly from the publication; fails to evaluate the quality of the source in terms of its currency, relevance, and accuracy; entries do not explain how the publication adds or relates to the ideas addressed in the essay. • Reference list does not follow APA style

Lesson Outline (20 pts)

<i>Criteria</i>	<i>Excellent</i>	<i>Satisfactory</i>	<i>Underperform</i>
	<i>4</i>	<i>3</i>	<i>1</i>
1. Identify both the option and the student/s (ELL/s) (option 1) or classroom (option 2).			
2. Describe the plans to contact and meet with the ELL/s or visit a classroom.			
3. Includes the date of the first meeting with the student/s (ELL/s) or the visit to the classroom.			
4. Includes a timeline (what, when, and how long) for the completion of the project.			
5. Questions or concerns about the design and delivery of the 5E lesson activity with the student/s.			

Threaded Discussion

This Threaded Discussion (TD) is intended to give you an opportunity to interact with your peers around some issues addressed in class. In order to receive full credit you will: (1) write and post an individual response addressing the discussion prompt, and (2) reply to the entries of at least one of your fellow classmates.

Threaded Discussion Rubric

Inadequate Participation (0)		Simple Participation (3)	Complex Participation (5)
Didn't participate at all	<ul style="list-style-type: none"> - <i>Single message posting</i> - Repeats others' comments - Simple agreement statements - Unrelated to topic - Poor spelling and grammar 	<ul style="list-style-type: none"> - Refers to posts and thread - Adds own opinion - Elaborates some insight - Mostly related to topic - Prompts further discussion - Few spelling or grammar errors 	<ul style="list-style-type: none"> - Refers to posts and thread - <i>Multiple message postings</i> (at least 2: your individual response and one postings with feedback) - Cites at least one assigned reading - Clear and concise - Develops an argument - Critiques other posts - Answers questions - Defends position

Growth Essay 2: My Views on Teaching and Learning Science in L2 (/60 pts)

Score	60 -----40	39 -----20	19-----1
Body of the Essay	<ul style="list-style-type: none"> The essay has a title that is informative and inviting. Essay is organized into sections; essay <u>elements</u> are clearly addressed; clear fluidity between sections (<u>underlined below</u>). States and describes the author's <u>current views</u> about science education (science teaching and learning practices) in linguistically diverse classrooms; <u>builds on essay one</u> by discussing how prior science and language learning experiences influenced the author's mission as a [science] educator in bilingual settings; essay describes how those <u>views informed the lesson design</u> and delivery in this class (the lesson activity with ELL/s). Reports on science and second language acquisition <u>concepts learned and practiced</u> during the activity conducted with ELL/s. Highlight the specific <u>linguistic learning needs</u> of the ELL/s as determined in the first meeting with student/s. Lists and discusses the <u>lesson plan decisions</u> based on the information gathered in the initial meeting with ELL/s); integrates five <u>citations</u> in the discussion of these decisions. The essay ends with a precise <u>reflection</u> on the teaching experience with ELL/s. Reference list follows the <u>APA* style</u> and includes at least five information sources/entries; cited publications are peer-reviewed (research journals). 	<ul style="list-style-type: none"> Title addresses ancillary issues in the essay. Essay is organized into sections; essay elements are partially addressed; good flow between sections. States and describes the author's current views about science education (science teaching and learning practices) in linguistically diverse classrooms; briefly builds on essay one by discussing how the author's prior science and language learning experiences influenced her/his mission as a [science] educator in bilingual settings; unclear how those views informed the lesson design and delivery in this class (the lesson activity with ELL/s). Vaguely reports on science and second language acquisition concepts learned and practiced during the activity conducted with ELL/s; mentions some specific linguistic learning needs of the ELL/s as determined in the first meeting with student/s. Sketchy Lists some lesson plan decisions based on the information gathered in the initial meeting with the ELL/s; integrates five citations in the discussion of these decisions. The essay ends with a vague reflection on the teaching experience with ELL/s. <i>Reference</i> list follows the APA style and includes less than five information sources/entries; only two of the cited publications are peer-reviewed. 	<ul style="list-style-type: none"> The essay does not have a title; it uses the assignment title. Essay is unorganized; it consists of a single long paragraph; lacks coherence. Broad description of the author's current views about science education (science teaching and learning practices) in linguistically diverse classrooms; inaccurately builds on essay one; unclear discussion of the link between the author's prior science and language learning experiences and her/his mission as a [science] educator in bilingual settings; does not discuss how those views informed the lesson design and delivery in this class (the lesson activity with ELL/s). Imprecise report on science and second language acquisition concepts learned and practiced during the activity conducted with ELL/s; lists a few specific linguistic learning needs of the ELL/s as determined in the first meeting with student/s. Did not identify lesson plan decisions based on the information gathered in the initial meeting with the ELL/s; integrates five citations in the discussion of these decisions. The essay ends without a reflection on the teaching experience with ELL/s. <i>Reference</i> list does not follow the APA style and includes 1-3 information sources; most entries are non-peer-reviewed publications (e.g., book chapters, websites, and some magazines).

<p>Format and Mechanics of English</p>	<ul style="list-style-type: none"> • Essay is well-organized; consistent in format throughout the paper. • Use of APA format is consistent throughout the manuscript; very few errors (<3) • No errors in grammar, spelling and punctuation • The length of the essay is correct (at least 8 pages, double-spaced, not including references) 	<ul style="list-style-type: none"> • Paper has some formatting issues; there is not a consistent format is followed throughout the paper. • Use of APA format is inconsistent throughout the manuscript; many APA style errors (5-6) • Errors in grammar, spelling and punctuation are distracting • The length of the essay goes over the length limit (6-7 pages, not including appendices) 	<ul style="list-style-type: none"> • Paper does not have a clear structured; it is inconsistent informat. • Little evidence of adherence to APA style. • Errors in grammar, spelling and punctuation are excessive. • The length of the manuscript is incorrect (≥8 pages, not including appendices)
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*American Psychological Association (APA). <http://www.apastyle.org/learn/index.aspx>

5E Lesson Plan: (/80 points)

	5 pts	3 pts	1 pt.
<i>Title, grade level, and Standards</i>	<ul style="list-style-type: none"> -The title is intriguing and represents the lesson plan -Lesson is grade level specific; it identifies the source. - Lists the pertinent standards for the target grade level (At least one standard). 	<ul style="list-style-type: none"> -The title is intriguing and represents the lesson plan -Two to three grade levels are included; source not included. - Cited standards do not fully relate to the lesson 	<ul style="list-style-type: none"> -The title is intriguing but does not represent the lesson plan -No grade level. -Lesson is loosely connected to the standards.
	10 pts	5 pts	1 pt.
<i>Learning objectives</i>	<ul style="list-style-type: none"> -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). 	<ul style="list-style-type: none"> - 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, to learn). 	<ul style="list-style-type: none"> -The description of the learning objectives is vague. -Action verbs in the objective statements do not support meaningful learning. -The lesson needs a great deal of improvement; a substitute teacher will have difficulties delivering this lesson. -Includes learning objectives that do not provide students with opportunities to demonstrate how much and how well they mastered the main concepts of the lesson.
	20-15 pts	14-8 pts	7-1 pt.
<i>Pedagogical, Linguistic, and/or Literacy Principles</i>	<ul style="list-style-type: none"> -The lesson identifies the framework (pedagogical and linguistic principles) that ground the lesson activity. -Defines and describes each principle (pedagogical and linguistic). - Describes how these principles guide the lesson delivery. -All principles come from course materials—those sources appear in the Reference section. 	<ul style="list-style-type: none"> -The lesson partially identifies the framework (pedagogical or linguistic principles) that ground the lesson activity. -Defines and describes some principles (pedagogical and linguistic). - Does not fully describe how these principles guide the lesson delivery. -Some principles come from course materials—those sources appear in the Reference section. 	<ul style="list-style-type: none"> -The lesson vaguely identifies the framework (pedagogical or linguistic principles) that ground the lesson activity. - - Does not describe how these principles guide the lesson delivery. -Some principles come from course materials—those sources appear in the Reference section.
	30-20 pts	19-10 pts	9-1 pt.

<p><i>Lesson Body</i></p>	<p>-Lesson clearly describes what the teacher and the student will do in each stage of the 5E cycle. -Engagement (hook/attention grabber): describes a hands-on strategy that creates interest and leads students into exploration. -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. -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. -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. -Evaluation: includes both formative and summative assessment formats; assessments address the concept and skills stated in the learning objectives.</p>	<p>-General description of what the teacher and the student will do in each stage of the 5E cycle. -Engagement (hook/attention grabber): unclear description of a hands- minds-on strategy that creates interest. Engagement does not clearly connect with the exploration phase. -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). -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. -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. -Evaluation: includes both formative and summative assessment formats; assessments partially address the concept and skills stated in the learning objectives.</p>	<p>-Vague description of what the teacher and the student will do in each stage of the 5E cycle. -Engagement (missing hook/attention grabber): lists an activity that is not hands- minds-on; activity does not create interest in the topic of the lesson. -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). -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. -Elaboration: a new hands/minds-on activity is not described; there is no evidence that students use this activity to apply concepts and skills. -Evaluation: includes a vague description of the assessment; does not identify the assessment type.</p>
	<p>5 pts</p>	<p>3 pts</p>	<p>1 pt.</p>
<p><i>Mechanic of English and Format</i></p>	<p>-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)</p>	<p>-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)</p>	<p>-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)</p>

- Punctual submission of your lesson plan for peer review: /5 pts
- Punctual submission of your feedback (Individually, and using this rubric) on the lesson you reviewed /5

