

SIED 5323: Societal Context of Science Education (CRN 17276)

Course Syllabus

Contact Information

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Office hours: Wednesday 2:00 -4:00 pm & Thursday 12:00 – 2:00 pm or by appointment.

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

Course Description

Societal Context of Science Education develops and applies understanding of the field, community, and cultural resources. Students develop a learning unit based on instructional models such as the learning cycle lesson design and the 5E model. Societal Context of Science Education also explores historical perspectives of science and the role of science in societal decisions. The class includes research-based principles in science learning and technology integration.

The class utilizes Problem-Based Learning (PBL) approach to curriculum development and delivery. PBL is an inquiry-based approach that can be defined as both a curriculum and a process. The curriculum consists of carefully selected and designed problems that engage the learner in the process of acquiring critical knowledge, developing proficiency in problem solving, engaging in self-directed learning, and participating in collaborative teams. This curriculum integration process engages students in collaborative research that can be shared in the classroom, across a community or around the globe. PBL features open-ended and cooperative activities that deal with real world issues and scenarios.

The curriculum approach will follow the Critical Thinking Curriculum Model (CTCM), which is a multidisciplinary approach designed to encompass computer technology, a current real world issue, and effective learning and teaching practices. As a PBL curriculum, it encompasses the political, social/cultural, economic, and scientific realms in the context of a real world issue. In this way, students realize the importance of their schooling by applying their efforts to an endeavor that ultimately will affect their future.

Prerequisites

Admission to UTEP Graduate School.

Course Goals and Objectives

Science is a critical, yet often poorly understood, aspect of society. The outcomes of science and technology are essential components of our everyday lives, from computers and smartphones to ozone holes and global warming. Many of the political and social issues that will arise during our lifetime require that we understand the methodology of science in order to make balanced, rational decisions. In this course we will explore aspects pertaining to the meaning of science, how it works, and its implications in society, as well as potential applications in science classrooms.

Goals

1. To provide opportunities to develop and apply critical thinking and problem solving skill through open-ended approaches in meetings specific course objectives and goals
2. To articulate the connections between scientific concepts and everyday life
3. To identify and articulate conceptual understandings and desired outcomes within a problem-based learning curriculum
4. To engage in class discussions and assignments that require the integration of skills in content development and content delivery
5. To analyze and synthesize an understanding of course material in both classroom and online environments through multiple classroom interaction strategies
6. To increase understanding of technology integration in articulating a concept-based science education curriculum product

Student Learning Outcomes

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

1. Design a Problem-Based Learning (PBL) curriculum unit
2. Identify the interconnections between science and society
3. Use technology including concept mapping programs
4. Exercise critical reading of text and websites
5. Write effectively about teaching, learning, and society
6. Become proficient in the curriculum alignment process
7. Address the Texas Essential Knowledge and Skills (TEKS) for appropriate grade levels

Assessment of Student Learning Outcomes

Assignment	Assessment of Learning Outcomes
VNOS Questionnaire with Reflection	Learning outcomes 2 and 4
Group Discussions	Learning outcomes 2, 4 and 5
Research Paper	Learning outcomes 1, 3, 5, 6 and 7
Participation	Learning outcomes 2, 3, 4 and 5
Final Product and Presentation	Learning outcomes 1, 2, 4, 5, 6 and 7

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 material 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 lecture notes that will be posted no later than Monday morning of each week throughout the semester. The weekly lecture notes will appear as a link in the Lectures 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. Primarily, you will use discussions, and assignments for turning in material to be graded. An overview of these tools is provided in the class syllabus. Additionally, I would also suggest that you begin to understand the differences between Synchronous and Asynchronous technology tools. Synchronous tools are those that you use in real-time, such as chat, instant messaging, and telephone conversations or talking to someone face to face. Asynchronous tools are those that have a delay in the delivery of some content and the

reception of that content by another person. Tools that fit this are email, discussion boards, and assignments in Blackboard, as well as phone messages left on an answering machine.

You will need to examine and understand the environment of your 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 email announcement, new content or changes that may come throughout the semester. It is recommended that you try and log in to the course at least once a day to make sure you do not miss any important announcements, which will be regularly.

Textbooks and Reading Materials

Erickson, Lynn (2006). **Concept-Based Curriculum and Instruction for the Thinking Classroom**, H. Corwin Press, Inc., Thousand Oaks, CA - ISBN # 9781412917001 (paperback).

Robertson, William H. (2008). **Developing Problem-Based Curriculum: Unlocking Student Success Utilizing Critical Thinking and Inquiry**, Kendall Hunt Publishing, Des Moines, Iowa - ISBN # 9780757553462 (paperback).

Additional readings may be posted as PDF files or handouts for students to read prior to topic dates.

Assignments

All online assignments are due by the posted time on the deadline date. Late assignments will not be accepted for full credit unless you have evidence of extenuating circumstances. Unfortunately, circumstances arise even for professionals in the field and you may 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. Please carefully read all instructions for each assignment. Reading instructions is your responsibility and you should meet all due dates and times.

Individual assignments will be done in the Assignments area and will need to be posted as Word.doc files. PowerPoint will may be required and will need to be submitted in .ppt format.

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.

Discussions

For class discussions, you will be communicating in a written format on an assigned topic individually or as a team on a given discussion board. Each team will consist of approximately three to four students. The discussion boards are located within this course. You will need to do the readings and go over the lecture notes to be effective in your responses. Obvious use of acquired content knowledge must be incorporated into discussions. Therefore, participation in discussions will reflect not only in your participation grade, but also in the thoroughness of your assignments.

For each discussion topic, each member should have a minimum of 1 individual response (100 words) to the overarching question and 2 individual postings for feedback (50 words) or in response to other group members' comments/postings. The deadlines for discussion postings and replies will be posted in the activities table and in the weekly announcement. You must ensure that you meet the deadlines for posting your contributions to the group discussion.

See the assignment rubric for details on the grading of your postings. Note that grades will be given on an INDIVIDUAL basis for participation in the group discussions. Do not post your responses to the

discussion board as attachments! Please type directly or copy and paste the text into the discussion boards.

Outline Activities – Due Dates Fall 2018

	Activity	Date Open	Date Due—Closed
1	Discussion 1	August 27 at 7:00 AM	September 2 at 11:55 PM
2	Views of Science (VoS) Questionnaire with reflection	Sept. 3 at 7:00 AM	September 9 at 11:55 PM*
3	PBL Overview Assignment	September 10 at 7:00 AM	September 16 at 11:55 PM
4	Discussion 2	September 17 at 7:00 AM	September 23 at 11:55 PM
5	Outline of Research Paper	October 1 at 7:00 AM	October 14 at 11:55 PM
6	Discussion 3	October 15 at 7:00 AM	October 21 at 11:55 PM
7	Discussion 4	November 5 at 7:00 AM	November 11 at 11:55 PM
8	Research Paper Assignment	November 19 at 7:00 AM	December 2 at 11:55 PM
9	PBL Product Assignment	November 19 at 7:00 AM	December 9 at 11:55 PM

*Reflection due by September 16.

Guidelines

- **Dates Due – Open:** Means that a discussion or written and uploaded assignment is now available.
- **Dates Due – Closed:** Means that a discussion or written and uploaded assignment 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
VoS Questionnaire with Reflection (20+10 pts)	30 points
Group Discussions (4x15 points each)	60 points
Research Paper	80 points
Participation*	60 points
Final Product and Presentation	120 points
Total	350 points

*The Participation score includes the following assignments: PBL Overview Assignment, Outline of the Research Paper, and Feedback on final product (3x20 pts).

A standard scale will be used in order to determine final grades. The scale is as follows:

- 90% or above= A
- 80% to 89.9%= B
- 70% to 79.9%= C
- 60% to 69.9%= D
- Below 60%= F

Communicating Effectively Online

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

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

Attendance Policy

Attendance is taken by monitoring your work 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.

Assigned Reading Material

Readings will be assigned for most modules. You will be responsible for reading and understanding these materials. Please use the help board to aid your classmates in these readings.

Course Schedule and/or Assignment Changes

The course instructor reserves the right to adjust the course syllabus or change assignments as needed. I will be sure to give you plenty of notice prior to any changes. 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.

Technical Assistance

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

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. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are not attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the Handbook of Operating Procedures (HOOP) and available in the Office of the Dean of Students, may result in sanctions ranging from disciplinary probation, to failing grades on the work in question, to failing grades in the course, to suspension or dismissal among others.

Students with Disabilities

If you have or believe you have a disability, you may wish to self-identify. You can do so by providing documentation to the Office of Disabled Student Services located in Union E Room 203. Students

who have been designated as disabled must reactivate their standing with the Office of Disabled Student Services on a yearly basis. Failure to report to this office will place a student on the inactive list and nullify benefits received.

Incomplete Grade

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

Course Calendar Fall 2018

Date	Topics	Online Activity	Reading Assignment
Week One 08/27 – 09/02	<ul style="list-style-type: none"> • Class Overview • Syllabus Review 	<ul style="list-style-type: none"> • Exploring Blackboard for class materials • Discussion 1 – Introductions 	<ul style="list-style-type: none"> • Read Erickson’s Chapter 1: <i>The Thinking Classroom</i>
Week Two 09/03– 09/09	<ul style="list-style-type: none"> • PBL Introduction 	<ul style="list-style-type: none"> • Complete the Pre Views of Science (VoS) Questionnaire <p><i>You will write a reflection/reaction based on the instructor’s feedback and question on your questionnaire</i></p>	<ul style="list-style-type: none"> • Read Robertson’s Chapters 1 & 2: <i>Introduction to Problem-Based Curriculum; Overview of Critical Thinking Curriculum Model (CTCM)</i> • Read Modules 1 and 2
Week Three 09/10– 09/16	<ul style="list-style-type: none"> • Concept Mapping Overview • The Critical Thinking Curriculum Model 	<ul style="list-style-type: none"> • PBL Overview Assignment • Research of PBL Web Sites 	<ul style="list-style-type: none"> • Read Erickson’s Chapter 2: <i>The Structure of Knowledge and Processes</i>
Week Four 09/17– 09/23	<ul style="list-style-type: none"> • Concept Map Products 	<ul style="list-style-type: none"> • PBL Overview Assignment • Research of PBL Web Sites 	<ul style="list-style-type: none"> • Read Erickson’s Chapter 3: <i>Designing Concept-Based Instructional Units</i>
Week Five 09/24– 09/30	<ul style="list-style-type: none"> • Guiding Questions and Curriculum Design 	<ul style="list-style-type: none"> • Discussion 2 	<ul style="list-style-type: none"> • Read Robertson’s Chapter 3: <i>The Components of the Critical Thinking Curriculum Model (CTCM)</i> • Read Module 3

Week Six 10/01– 10/07	<ul style="list-style-type: none"> • Overview of Technology Tools 	<ul style="list-style-type: none"> • Identify PBL topic 	<ul style="list-style-type: none"> • Read Robertson’s Chapters 4 & 5: <i>Standard Alignment and the CTCM; Developing Problem-Based Curriculum</i> • Read Modules 4 and 5
Week Seven 10/8– 10/14	<ul style="list-style-type: none"> • Phase 1- Planning 	<ul style="list-style-type: none"> • Outline of Research Paper 	<ul style="list-style-type: none"> • Read Robertson’s Chapter 6: <i>Curriculum on Disaster/Emergency Management</i> • Read Modules 6 and 8
Week Eight 10/15– 10/21	<ul style="list-style-type: none"> • Phase 2- Research 	<ul style="list-style-type: none"> • Research of PBL Products 	<ul style="list-style-type: none"> • Read Erickson’s Chapter 4: <i>Inquiry Learning and Concept-Based Lessons</i>
Week Nine 10/22– 10/28	<ul style="list-style-type: none"> • Sharing of PBL Topics 	<ul style="list-style-type: none"> • Discussion 3 	<ul style="list-style-type: none"> • Read Robertson’s Chapter 7: <i>Curriculum on Building a Historical Perspective of the Nuclear World</i> • Read Research Paper Guidelines and References
Week Ten 10/20– 11/04	<ul style="list-style-type: none"> • Guiding Questions and Curriculum Alignment • Phase 3 - Development 	<ul style="list-style-type: none"> • Developments of PBLs 	<ul style="list-style-type: none"> • Read Erickson’s Chapter 5: <i>The Developing Concept-Based Teacher and Self-Assessments</i>
Week Eleven 11/05– 11/11	<ul style="list-style-type: none"> • Phase 4- Refinement • Project and Presentation Overview and Rubrics 	<ul style="list-style-type: none"> • Development of PBL final products 	<ul style="list-style-type: none"> • Read Robertson’s Chapter 8: Conclusions on <i>Developing a Historical Perspective of the Nuclear World</i> • Read Module 7

Week Twelve 11/12- 11/18	<ul style="list-style-type: none"> Phase 5- Implementation 	<ul style="list-style-type: none"> Discussion 4 Development of PBL final products 	<ul style="list-style-type: none"> Read Module 9 in Course Content Area
Week Thirteen 11/19- 11/25	<ul style="list-style-type: none"> Sharing of PBL topics 	<ul style="list-style-type: none"> Refinement of PBL final products 	<ul style="list-style-type: none"> Continue working on research paper, final project and final presentation
Week Fourteen 11/26- 12/02	<ul style="list-style-type: none"> Development of PBL final products 	<ul style="list-style-type: none"> Development of PBL final products 	<ul style="list-style-type: none"> Continue working on research paper, final project and final presentation
Week Fifteen 12/03- 12/09	<ul style="list-style-type: none"> PBL product finalized and delivered Online class presentations <p><i>Dec. 6 last day of classes</i></p>	<ul style="list-style-type: none"> PBL product finalized and delivered in Blackboard Research paper due in Blackboard Online class presentations 	