

## SIED 3330 – Fall 2016

# Integration and Alternative Representations of Basic Science Principles

Tuesday, 6:00 PM - 8:50 PM, EDUC 405, UTEP

*It's what you learn after you know it all that counts. - John Wooden*

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**Office hours:** Tuesdays 4:00 - 5:30 PM, by appointment otherwise  
**Textbooks:**

- Allen, Richard Howell (2001). *Impact Teaching: Ideas and Strategies for Teachers to Maximize Student Learning*, Allyn & Bacon. ISBN # 0205334148 (paperback).
- Brooks, J. G., & Brooks, M. G. (1999). *In Search Of Understanding: The Case For Constructivist Classroom*,. Alexandria, VA: ASCD. ISBN # 0871203588 (paperback).
- Robertson, W.H. (2014). *Action science: Relevant teaching and active learning*, Corwin Publishers, Thousands Oaks, CA. - ISBN #978-1452256566 (paperback)

### Course Description

Integration and Alternative Representations of Basic Science Principles is a cross-disciplinary course that integrates basic science principles, as well as explores the methods and materials needed for teaching science. Topics will be selected from the various sciences, including biology, chemistry and physics. The course emphasizes the interrelationships among the various sciences and alternate conceptual representations of identified basic science principles. The emphasis of the class will be placed upon inquiry and standards-based teaching and learning. This includes the utilization of computer applications and field experiences.

### Goals

This course is designed to help you examine critically the perspectives, philosophies, materials, and strategies for effective learning in secondary science classrooms. The ultimate goal is to understand how to design a learning climate where every student is held to high expectations and achieves maximum learning. In particular, the participants will develop a better understanding of effective science teaching and learning in schools in the unique border schools so our community will be equipped to make informed decisions about our world, to pursue science fields, to critically examine the power of science in our society, and to participate in improving our society.

## Objectives

Demonstrate the following components vital to quality science education:

- Ability to implement an inquiry-based science curriculum
- Ability to assist students in designing investigations using scientific inquiry
- Understanding of the binational and bilingual implications in El Paso area science education
- Understanding of the role of women and underrepresented groups in science decisions and science careers
- Exhibit professionalism as a teacher of science
- Understanding of local resources and quality curriculum materials to assist your science program
- Improvement in your personal understanding of science concepts
- Understanding of standards for excellence (National Science Education Standards, TEKS, Excellence in Environmental Education -- Guidelines for Learning)

## TEExES Standards

You will be practicing teaching using a constructivist curriculum designed to provide successful learning experiences for all the children. Through this actual classroom teaching experience, you will be practicing concepts from Standards I, II, and III on the Pedagogy and Professional Responsibilities Standards (PPR) with particular emphasis on planning and designing instruction, instructional strategies, informal and formal assessment, and managing the classroom environment. The class 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 II: The science teacher understands the correct use of tools, materials, equipment, and technologies.
- 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 science.
- Standard V: The science teacher knows the varied and appropriate assessments and assessment practices to monitor science learning.
- Standard VI: The science teacher understands the history and nature of science.
- Standard VII: The science teacher understands how science affects the daily lives of students and how science interacts with and influences personal and societal decisions.

## Student Learning Outcomes

The course's learning outcomes will require the student to acquire throughout the semester new knowledge and skills and build upon them. The following table provides a list of the most relevant student learning outcomes for the course.

	<b>Student Learning Outcomes</b>	<b>Assessments</b>
	<i>By the end of course, the student will be able to:</i>	<i>To evaluate these outcomes, the faculty member will use the following assessment procedures:</i>
1.	Develop an understanding of current issues, practices and directions in science curriculum and the ability to inquire into these.	a. Class participation & discussions b. Quizzes, online discussion and assignments.
2.	Develop knowledge and skills in educational research.	a. Class participation & discussions b. Class presentations c. Quizzes, online discussion and assignments.
3.	Identify and analyze topics of importance in current science education.	a. Class participation & discussions b. Class presentations c. Quizzes, online discussion and assignments.
4.	Deepen their commitment to their pupils' science learning.	a. Class participation & discussions b. Quizzes, online discussion and assignments.
5.	Increase their confidence to teach science.	a. Class participation & discussions b. Class presentations
6.	Improve their ability to manage and assess their pupils' learning. Discover innovative methods of instruction to increase effectiveness and pupils' engagement, learning, and thinking.	a. Class participation & discussions b. Class presentations c. Quizzes, online discussion and assignments.
7.	Improve their capacity to think reflectively and creatively about their science teaching.	a. Class participation & discussions b. Class presentations c. Quizzes, online discussion and assignments.
8.	Increase their capacity to become an agent of change in the field of science education.	a. Class participation & discussions b. Class presentations
9.	Develop knowledge and strategies to design curriculum at classroom and school levels.	a. Class participation & discussions b. Class presentations c. Quizzes, online discussion and assignments.
10.	Differentiate among facts, laws, theories, and hypotheses.	a. Class participation & discussions b. Class presentations c. Quizzes, online discussion and assignments.
11.	Define major concepts, principles, and fundamental theories in at least one area of science.	a. Class participation & discussions b. Class presentations c. Quizzes, online discussion and assignments.
12.	Demonstrate an understanding of the basic terminology in at least one area of science.	a. Class participation & discussions b. Class presentations c. Quizzes, online discussion and assignments.

## Course Requirements

- **Class Participation and Attendance (10% of course grade):** It is expected that all students will be actively and professionally engaged in class discussions and activities. Successful completion of the course depends on regular participation and interaction in classroom and online learning experiences. Students missing a class are responsible for completing any exercises, readings, etc. as well as writing a one-page essay on the readings before the start of the next class. Numerous absences may adversely affect your grade and three unexcused absences will lower your grade one letter grade automatically.
- **Written Responses (50% of course grade):** Discussions, assignments and quizzes document your reflective thinking and learning. These must be submitted by the due date in Blackboard. Each student is expected to complete all readings, exercises, discussion and written assignments. Students missing the due date for an assignment must make immediate arrangements with the instructor to fulfill that requirement before the next class meeting.
- **Mid-Term and Final Projects (35% of course grade):** Presentation and analysis of a series of integrated, constructivist lessons. You will develop and implement a series of quality science lessons and the in-depth analysis of those lessons. These lessons will demonstrate good curriculum practices and integrate sound pedagogical techniques and educational philosophies. You will also be expected to model these techniques within your presentation and instruction. Written work should be submitted on the due date assigned and in proper written format. This will also include both your midterm and final projects.
- **Community Outreach Activity (5% of grade):** Students will participate in and provide a 2-3-page reflection paper on a community outreach activity. This activity can focus on any of the following areas: parenting, communicating, volunteering, learning at home, decision making and collaborating within the community.

## Grading Evaluations

A: 90% - 100%, B: 80% - 89%, C: 70%-79%, D: 60%-69%, F: <60%

## Grading Criteria

The course will be assessed based on the following criteria:

<b>Activity</b>	<b>Percentage of Grade</b>
Quizzes/Discussion/Assignments	50%
Mid-Term & Final Projects	35%
Participation	10%
Community Outreach	5%
<b>Total</b>	<b>100%</b>

## Class Schedule:

Classes will be on Tuesdays from 6:00 to 8:50 PM in room 405 of the Education Building at UTEP during the fall 2015 semester. As this is a Hybrid class, 50% of the classes will be face to face (F2F) and 50% will be online (ONL). Homework will be assigned regularly. The class will be a combination of lecture, guided instruction, classroom discussion, classroom exercises, and project development. Every class session is vital.

Date	In-class activities	Online Assignments	Readings
August 23 <sup>rd</sup> (F2F)	Introductions and Icebreakers  Syllabus Review  Blackboard and Web site overview  Brainstorming/Concept Mapping  Science Demonstration 1	Use of Blackboard at UTEP for Class materials  Introductions using Blackboard discussion boards  Discussion 1 - Metaphor	Read Chapter 1-2 in <b>The Case for Constructivist Classrooms</b>
August 30 <sup>th</sup> (ONL)	<b>Online Class Only</b>  <b>No Face To Face Meeting</b>	Quiz 1 - Syllabus and Class Procedures  Discussion 2 – Fundamentals of Constructivism  Cultural Portrait Overview	Read Chapters 3-4 in <b>The Case for Constructivist Classrooms</b>
September 6 <sup>th</sup> (F2F)	Constructivism (5Es)  Small Group F2F discussion  Science Demonstration 2  TEKS identification  Backward Design Process	Assignment 1 – Cultural Portrait  Submit in Assignments Area (.doc or .rtf file)	Read Chapter 5-6 in <b>The Case for Constructivist Classrooms</b>

<b>Date</b>	<b>In-class activities</b>	<b>Online Assignments</b>	<b>Readings</b>
September 13 <sup>th</sup> (ONL)	<b>Online Class Only</b>  <b>No Face To Face Meeting</b>	Quiz 2 – Constructivist Classroom  Discussion 3 - Standards and the TEKS	Read Chapters 7-8 in <b>The Case for Constructivist Classrooms</b>
September 20 <sup>th</sup> (F2F)	Biology Activities  TEKS and TAKS  Activity Modeling  Mid-Term Rubric Overview  Mid-Term Discussions	Assignment 2 – Science Content and Methods  Submit in Assignments Area (.doc or .rtf file)	Read Chapters 1-2 in <b>Action Science: Relevant Teaching and Active Learning</b>
September 27 <sup>th</sup> (ONL)	<b>Online Class Only</b>  <b>No Face To Face Meeting</b>	Assignment 3 - Activities and the TEKS  Submit in Assignments Area (.doc or .rtf file)	Read Chapters 3-4 in <b>Action Science: Relevant Teaching and Active Learning</b>  Student Development (on your own) of Mid-Term Projects
October 4 <sup>th</sup> (F2F)	Chemistry Activities  <b>Mid-Term Projects and Presentations by Each Student</b>  Technology in Teaching and Learning 1	<b>Mid-Term Product</b>  Submit in Assignments Area (.doc or .rtf file)	Read Chapters 5-6 in <b>Action Science: Relevant Teaching and Active Learning</b>
October 11 <sup>th</sup> (ONL)	<b>Online Class Only</b>  <b>No Face To Face Meeting</b>	Quiz 3 – Action Science  Discussion 4 - Web Resources for Science	Read Chapters 7-8 in <b>Action Science: Relevant Teaching and Active Learning</b>

Date	In-class activities	Online Assignments	Readings
October 18 <sup>th</sup> (F2F)	Physics Activities  Overview of Science Education Web Sites  Inquiry Science  English Language Learners  Technology in Teaching and Learning 1	Assignment 4 – PDS  Submit in Assignments Area (.doc or .rtf file)	Read Chapter 1-2 in <b>Impact Teaching</b>
October 25 <sup>th</sup> (ONL)	<b>Online Class Only</b>  <b>No Face To Face Meeting</b>	Discussion 5 – The Constructivist Science Classroom	Read Chapter 3-4 in <b>Impact Teaching</b>
November 1 <sup>st</sup> (F2F)	Impact Teaching  Modern Methods and Pedagogy  Video Instruction  Community Outreach Activity Overview	Assignment 5 – Science Instruction  Submit in Assignments Area (.doc or .rtf file)	Read Chapter 5-6 in <b>Impact Teaching</b>
November 8 <sup>th</sup> (ONL)	<b>Online Class Only</b>  <b>No Face To Face Meeting</b>	Quiz 4 – Strategies for Teaching in the Classroom	Read Chapter 7 in <b>Impact Teaching</b>

<b>Date</b>	<b>In-class activities</b>	<b>Online Assignments</b>	<b>Readings</b>
November 15 <sup>th</sup> (F2F)	Go over Assignment Criteria and Rubric for Final Exam	<b>Community Outreach Activity</b>  Submit in Assignments Area (.doc or .rtf file)	Final Project Preparation
November 22 <sup>nd</sup> (ONL)	<b>Final Project and Poster Session Preparation</b>	Final Project Preparation	Final Project Preparation
November 29 <sup>th</sup> (F2F)	<b>Final Project and Poster Session Presentation</b>	<b>Final Product</b>  Submit in Assignments Area (.doc or .rtf file)	All Final Assignments Due

**\*\* You must submit all your course assignments in Blackboard by the assigned dates and times. Your work will only be accepted through this method \*\***

### **SIED 3330 Activities – Due Dates Fall 2016**

<b>Online Activity</b>	<b>Date Open</b>	<b>Date Due - Closed</b>
Introduction - Discussion	August 23 at 7:00 AM	August 30 at 11:59 PM
Discussion 1	August 23 at 7:00 AM	August 30 at 11:59 PM
Quiz 1	August 30 at 7:00 AM	September 6 at 11:59 PM
Discussion 2	August 30 at 7:00 AM	September 6 at 11:59 PM
Assignment 1	September 6 at 7:00 AM	September 13 at 11:59 PM
Quiz 2	September 13 at 7:00 AM	September 20 at 11:59 PM
Discussion 3	September 13 at 7:00 AM	September 20 at 11:59 PM
Assignment 2	September 13 at 7:00 AM	September 27 at 11:59 PM
Assignment 3	September 20 at 7:00 AM	October 4 at 11:59 PM
Mid-Term Project	September 20 at 7:00 AM	October 11 at 11:59 PM
Discussion 4	October 11 at 7:00 AM	October 18 at 11:59 PM
Quiz 3	October 11 at 7:00 AM	October 18 at 11:59 PM
Assignment 4	October 11 at 7:00 AM	October 25 at 11:59 PM
Discussion 5	October 25 at 7:00 AM	November 1 at 11:59 PM
Assignment 5	October 25 at 7:00 AM	November 8 at 11:59 PM
Quiz 4	November 8 at 7:00 AM	November 15 at 11:59 PM
Community Outreach	November 8 at 7:00 AM	November 15 at 11:59 PM
Final Project PPT	November 15 at 7:00 AM	December 4 at 11:59 PM
Final Project Write Up	November 15 at 7:00 AM	December 4 at 11:59 PM



- **Date Open** means that a discussion, quiz or written and uploaded assignment is now available.
- **Date Closed** means that a discussion, quiz 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 undergraduate class as outlined in the course syllabus.**

## **Instructions for Accessing Your Course Online with Blackboard**

You must have an UTEP e-mail ID and password before you can access Blackboard.

UTEP automatically generates an e-mail ID for you when you are entered into the system.

If you do not have your ID or do not remember the ID or password call the helpdesk first at (915) 747-5257

All the course content will be delivered via Blackboard. You can access Blackboard by following the steps outlined below

- **Go to** <http://my.utep.edu>
- **Your login is your e-mail ID and your password is your e-mail password.**
- Once you are in the **my.utep.edu** portal, you can find the link to Blackboard near the top of the webpage

In case the above URL does not work, you can do the following:

- Go to <http://blackboard.utep.edu>
- **Your login is your e-mail ID but your password is your goldmine password**, which is generally a 6 digit number. You need to have an UTEP e-mail ID to be able to access Blackboard.

Once you are logged into Blackboard, you will find all the courses you are registered for, under the appropriate semester. Click on your course title to access the course.

If you have any questions concerning this process, you must contact the UTEP Help Desk at (915) 747-5257 or [helpdesk@utep.edu](mailto:helpdesk@utep.edu). This is your best and most reliable resource concerning issues related to both the UTEP Web portal and tools including Blackboard.

All course correspondence with the instructor must be done using the tools in Blackboard.

## **UTEP Policies**

### ***Academic Dishonesty***

*Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another person's as ones' own. And, collusion involves collaboration with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be taken seriously and will be referred to the Dean of Students Office for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions.*

### ***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. If you have a condition which may affect your ability to exit safely from the premises in an emergency or which may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the director of Disabled Student Services. You may call 747-5148 for general information about the Americans with Disabilities Act (ADA).*