



UNIVERSITY OF TEXAS AT SAN ANTONIO
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
Department of Interdisciplinary Studies and Curriculum & Instruction
C&I 4403 Approaches to Teaching Math & Science Grades EC-4
Spring 2008

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Prerequisites: Completion of curriculum requirements as noted for C&I 4403 in the UTSA catalog 2006-2008 and acceptance into the teacher certification program.

Department of Interdisciplinary Learning and Teaching: Mission and Goals

MISSION

The mission of the department of ILT is to foster the intellectual and professional growth and integrity of students and faculty through critical reflection and dialogue, civic responsibility, and leadership. This mission will be accomplished by nurturing a community of interdisciplinary learners who:

- Promote excellence in academic and pedagogical knowledge and research
- Engage in reflective practice
- Embody a strong professional identity and can articulate their philosophies and values
- Value diversity and multiple perspectives
- Promote equality and social justice
- Care about their students and their profession
- Advocate for educational change and reform

GOALS

The department of ILT will create a context that nurtures interdisciplinary learners who:

- Acquire and demonstrate content and discipline knowledge
- Demonstrate an awareness and acknowledgement of and engagement in research-based, reflective, culturally responsive practices
- Are producers, disseminators, and critical consumers of research
- Demonstrate an awareness and acknowledgment of and engagement in social justice and equitable practices
- Articulate their professional philosophy and demonstrate a strong professional identity

This course, C&I 4403, is one of many classes you will take within the Department of Interdisciplinary Learning and Teaching that will fulfill this mission and goal.

Course Description:

A study of pedagogical approaches and materials designed to support young children's meaningful exploration, discovery, and construction of basic concepts and skills in mathematics and science in preschool through grade 4. Emphasis will be on the interrelatedness of math and science in the curriculum; how to provide an effective learning environment; how to plan and implement inquiry-based math and science lessons; assessment of student learning; and the use of an integrated curriculum approach to teaching. Twenty-five hours of field-based experience in a preschool/elementary school classroom during the semester are required.

Rationale

The early grades of Early Childhood through grade 4, provide prime opportunities for teachers to work with students on developing, exploring, and understanding the mathematics and science curricula. Teacher candidates must learn how to apply the knowledge and concepts of this curriculum in classroom settings using a variety of teaching models, explorations, and strategies. This will be done in an EC-4 school environment that will allow candidates to work directly with classroom teachers and their students in an ongoing school context of learning and reflection. Emphasis will be placed on constructivist and socio-constructivist theoretical frameworks for the self-development of all learners, as well as the implications for integrating mathematics and science instruction.

Objectives:

1. To examine the PreKindergarten Guidelines and K-4 Texas Essential Knowledge and Skills in science and mathematics throughout the EC-4 continuum, and relate these standards to research-based instructional practice in diverse settings.
2. To develop an understanding of various teaching models that reflect research-based instructional methods and strategies and to be able to apply this knowledge to teaching and learning specifically related to science and mathematics.
3. To develop an understanding of and facility in using manipulatives and lab materials in mathematics and science teaching, that also promotes safety awareness for children in grades EC-4. Go to www.utdanacenter.org, the Dana Center for a list of safety guidelines for science materials.
4. To emphasize the interdisciplinary nature of instruction in the early grades, while systematically developing foundational competencies in science and mathematics.
5. To plan, implement, monitor, assess, and adjust instruction to enhance the learning of all students within classrooms (to include lesson planning and project development that is anti-bias, diverse, and multicultural, and uses school and community resources).

6. To develop and apply understandings of diverse children's language, literacy and culture and to provide active, meaningful learning opportunities consistent with community norms and the goals of the instructional program.
7. To become familiar with a variety of available programs, approaches, and possible classroom organization relevant to instruction in science and mathematics.
8. To implement and monitor the use of technology as a tool for teaching and learning.
9. To apply principles of classroom management and positive discipline in instructional settings.
10. To develop and refine knowledge of authentic assessments in mathematics and science, and to apply this understanding to ongoing assessment in the classroom.

Required Texts

Burris, A. C. (2005). Understanding the math you teach: Content and methods for prekindergarten through grade 4. Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Carin, A. A., Bass, J. E. & Contant, T. L. (2005). Teaching science as inquiry (10th ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Download TEKS for Math and Science (EC-4):
<http://www.tea.state.tx.us/teks/index.html>

Download safety handbook: <http://www.utdanacenter.org/>

Great Websites:

<http://www.netrover.com/~kingskid/Math/math.htm>

<http://www.pitt.edu/~edindex/InfoAge4index.html> .

<http://www.mpls.k12.mn.us/MCGFDA/mcgfda.page7a.html>

Field-Based Designation

Extensive field experiences, offering candidates opportunities to interact with diverse children, are closely linked with coursework in C&I 4403. These field hours allow students to extend and refine their understanding of children's learning and development and teachers' work, under the supervision of university professors and cooperating teachers in elementary schools. Field experiences include but are not limited to instructional activities with students in the assigned classroom, observing lessons conducted by university professors in elementary schools, participation in faculty and parent meetings, and experiences in special area classrooms.

The student **must complete a minimum of 25 hours of field work** in an assigned classroom, in a K-4 public school setting **OR NO GRADE WILL BE GIVEN FOR THE COURSE**. The field experience hours do not earn points toward a grade, but they are an indisputably required part of completing the course. These hours must be completed on a weekly basis and must be completed during classroom instructional time. Time spent observing students in the cafeteria, for example, does not count toward field placement hours. Field work will consist of assisting children during learning activities and teaching of actual lessons. **It is expected that students will be interacting with children during field placement hours, not merely observing.** Students will work with children in large and small groups and one-to-one tutoring types of activities as requested by the cooperating teacher. Course forms are available on WebCT or through your instructor.

Most approaches classes will be held on the campus in which field experiences occur. Students enrolled in field-based classes are required to pass a criminal history screening prior to participation in learning opportunities with children.

It is also mandatory that you maintain the following attitudes:

- Preparedness. Complete your assignments on time. Be ready for class and for your teaching lessons with your elementary students. Being prepared is crucial in teaching.
- Professionalism includes (but is not limited to) the way in which we present ourselves in the school in which we'll be working. The way we dress and act is important to our projection as teachers to both the students in the school as well as to the other teachers and administrators. Please see the attached questionnaire for a better understanding of what it means to be a professional.

Any breach of professional ethics or conduct deemed unsuitable by the cooperating teacher in the field placement and/or the course instructor could result in the student being dropped from the course or disciplinary action by the university following the policies specified in the Fitness to Teach Guidelines and/or the UTSA Student Handbook.

Note: During the semester you will be using materials from our partner elementary school. You are encouraged to use these materials and are expected to return the materials as soon as you are finished. All materials must be returned by the last day of class. A grade of “*Incomplete*” will be assigned for students who have not returned all materials by the last day of class.

Course Requirements

Grading Criteria

Grading criteria and specifications for each assignment will be given by the instructor.

The following conditions apply to all assignments:

1. Assignments must be turned in on or before the specified due date. Assignments are due at the beginning of class. Only emergency situations will be evaluated at the discretion of the instructor.
2. Assignments must be complete upon submission. No incomplete assignments will be accepted. No resubmissions will be allowed unless requested by the instructor.
3. All written assignments should be prepared in a manner that is neat and error-free. This assumes you have proofread your work for grammar, spelling, punctuation, and sentence construction. **Points will be taken off for neglect in these areas.**
4. All assignments must be typed using a word processing software package unless otherwise indicated by the instructor. Facilities are available to students on campus for this purpose. **A cover sheet or heading at the beginning of the assignment should be used to identify your name, date, and the title of the assignment. Your name should appear at the top of all subsequent pages. Papers with multiple copies must be stapled. Please do not put assignments in plastic covers or folders unless otherwise directed by the instructor.**

Lessons and Reflections:

Under the supervision of the cooperating teacher (**substitute teachers are not valid supervisors**), the student will plan and teach one Science lesson, one Math lesson, and one integrated Science/Math lesson (or, any combination of lessons may be integrated math/science) in a field-based classroom during the semester. Lessons will be planned mainly for **large group** instruction, but some **small group** instruction may also take place if the cooperating teacher is able to view and evaluate the lesson given in this situation. The students will be expected to show evidence in their lesson plans of addressing the TEKS, the integrated use of technology, and the diverse and multicultural needs and abilities of the children in their field placement. The lessons will follow a lesson format provided in class.

Lessons must be presented to the course instructor and the cooperating teacher prior to teaching a lesson plan. **Lesson plans must be turned in for review and feedback by the instructor according to the deadlines designated in the course schedule (or approximately 2 weeks prior to the date for teaching the lesson).** Lessons taught without prior approval from the instructor will not be considered as fulfilling the requirements for this course. Lesson plans must be submitted at least two weeks prior to teaching the lesson to allow for turn around time. **ALL LESSONS MUST BE PRESENTED TO THE COOPERATING TEACHER BY THE STUDENT FOR REVIEW PRIOR TO TEACHING THE LESSON.** There is a place on each lesson evaluation form for the CT to initial they have previewed the lesson with the student prior to its being implemented.

All lesson plans, with reflective self-evaluations and a copy of the cooperating teacher's evaluation attached (in this order), will be turned in for grading **no less than two weeks after the student has taught a lesson.** The instructor will provide deadlines for turning in lesson plans.

Examination and critique of curriculum materials.

Analysis and critique of a range of materials, including state-adopted texts, learning systems, software, and computer programs for EC-4 science and mathematics will be undertaken. In addition to state-adopted materials, children's trade books and supplementary texts and materials may be examined. Guidelines for this comparison process will be given via WebCT. This is a group activity where findings will be presented using one of many technology resources.

Reflective Journal

- A format for an evaluative journal and questions for focusing student reflections on important components of their field-based experiences will be provided by the instructor. Journals should include reflections on the various experiences in field-placement work, readings, interactive professional experiences, and class work and discussions.
- Written responses to readings: "Reading responses" are meant to help you organize the information you've learned from the readings as you read. Each response will be turned in at the beginning of the class on the day of the assigned reading. Each of your responses should have the following components. These components should include the following:
 - Identification of: Author, title, Date of your response, and your name
 - Summarize the reading by producing a single paragraph that indicates the central points of the material or by listing the three most important ideas you got from this reading. Paraphrasing or quoting is good. Please be sure to include page numbers if you do quote.
 - Reaction --After your brief summary, you'll want to react to the reading by writing a three-section response:
 - The first section includes your "*Aha's*" or *insights* that you made with the chapter—as in "Aha, I never thought of that, but now that I have..."
 - The second section includes your puzzlements or *ponderings* (those aspects of the reading that leave you wondering or uncertain).
 - The third section will be a connection to something you've experienced outside of the reading. Perhaps the reading reminded you of something you read before, or saw in a classroom, or experienced yourself as a reader and writer.
- Other responses as assigned by your instructor (such as Journal Focus Questions).

Each week students will share their journal entries with a classmate(s) in a format designated by the instructor. The instructor will review these journals throughout the semester. ***The final journal will address the Teacher Competencies that are observed throughout the year.*** (Instructor will provide Teacher Competencies Observation guide in WebCT.)

Texts and Readings

Students are expected to prepare in advance for classroom discussions and activities by reading assigned texts and readings according to the course schedule. Information in the readings will be used as a basis for evaluating field-based experiences, for topics of discussion in journals, and for in-class activities.

Quizzes will be administered related to the readings for the course if the instructor determines the need for them to induce the reading of assignments.

Project WILD

Students are required to attend a workshop at some point in the semester to earn certification as a Project WILD environmental educator. Attendance is mandatory and cannot be made up in any way. *Times of the workshops will be 8:30 am - 4:00 pm. This is a required component of the approaches course...ALL students are required to attend for the full day, regardless if they have taken a previous workshop at some other site. Students are to dress appropriately for the weather...all activities will be outdoors in a covered pavilion. They are to bring plenty of water and other drinks (no vending machines available). No flip flops should be worn as we will be hiking the park trails. Trails for students with disabilities are available. Students will get 30 minutes for lunch, so they MUST bring a sack lunch (closest food is over 2 miles away) and any snacks for the day.*

Major Project

Students will be required to produce their own webquest for a selected grade level and integrated math and science topic. First, they will examine several sample webquest projects. This will assist students in learning about the parts of a good webquest design.

The second part of the project will require the students to work as a group and design their own webquest that integrates math and/or science under a specific topic. The webquest will be presented in a power point presentation and a copy of the presentation will be emailed to the instructor prior to the group presentation of the webquest. The webquest will not have to be posted to the web, but it must be appropriate for grades K-4. Directions and evaluation information are posted on WebCT.

Other Assignments

Assignments related to the course may be required at the discretion of the instructor as the course unfolds that clarify, support, or provide concrete experience with a topic under discussion. Also, extra credit opportunities will be announced when appropriate.

<u>Grading</u>	<u>Grade Points</u>
Attendance and Participation	20
Quizzes, other Assignments, and Professionalism	20

Three Lessons and Reflections (40 each lesson, 10 each reflection)	50/150
Examination and Critique of Materials and Technology	20
Project WILD	20
Journal	20
<u>Project: Math/Science Webquest (design, presentation, & reflection)</u>	<u>50</u>
Total points =	300

300-270	= A
269-240	= B
239-210	= C
209-180	= D
179 or lower	= F

Fitness to Teach Policy

UTSA College of Education and Human Development's Fitness-to-Teach policy. In order to enter into your field placement with your cooperating teacher, you must *complete the Fitness to Teach Reflection attached to this syllabus.* The Fitness to Teach policy is intended to make sure that you fully understand the requirements of professional behavior as a student in the COEHD. You can find this policy at <http://coe hd.utsa.edu/FTT/FTT.htm>. This Reflection is due at the beginning of the second class meeting time.

ATTENDANCE & PARTICIPATION

Attendance of scheduled classes and field-based experience are **mandatory** for the completion of this course. Activities designed for class participation cannot be replicated apart from class sessions. Nor can field experiences be replicated. Therefore, attendance is expected for each class session. Attendance will be checked at the beginning of each class period. It is **the student's responsibility** to sign the class roster. In order to be considered present for the class, the student must arrive on time and remain for the entire class period. No absences are allowed in this course, except for extreme emergencies ("emergency" is left to the discretion of the instructor). Upon the **second** unexcused absence of a student in a one day/week course, the student will be asked by the instructor to drop the course. If the drop period has expired, the student will receive a reduction in the final grade by one (1) letter grade. Each additional absence will result in a subsequent reduction of the final grade by an additional letter grade. The instructor will also initiate a Fitness to Teach review as outlined on <http://coe hd.utsa.edu/FTT/FTT.htm>.

Tardiness will be considered for absences by the addition of the minutes missed in each class period. Every total of 60 minutes missed in a one day/week course, due to tardiness will be considered as 1 unexcused absence. The consequences for absences explained above will then be applied by the instructor.

***In other words, do not miss class and do not be late. If you do find yourself in an emergency situation, please call the school and leave a message for me and your classroom teacher that you will not be attending on that day before 8:00 a.m. There will be no exceptions to the attendance policy.

POLICIES AND PROCEDURES

Students are expected to demonstrate professional conduct and attire during class sessions. In order to minimize distractions, students will not leave the room during class unless an emergency arises. **Students will refrain from engaging in individual conversations during lectures or class discussions as such behavior is considered unprofessional.** All cell phones and beepers must be turned off during class periods.

Any incidence of scholastic dishonesty or other student discipline issues, the instructor will follow all the policies and procedures, in regard to students, as they are specified in

the Fitness to Teach Guidelines and the UTSA Faculty Handbook. (Section IV, pages IV-311-vi).

UTSA Honor Code:

“On my honor, as a student at The University of Texas at San Antonio, I will uphold the highest standards of academic integrity and personal accountability for the advancement of the dignity and the reputation of our university and myself.”

No electronic recording of lectures or class sessions may be done without the prior permission of the instructor. **No eating, drinking, or smoking is allowed in UTSA classrooms and laboratories.** (Ad. Memorandum No. 54).

Students with disabilities must be registered with the Office of Disability Services (MS 2.03.18, telephone 458-4157) in order to receive support services and/or special accommodations.

Attention is directed specifically to the Fitness to Teach Guidelines, Part C, 2, unconditional acceptance: “... the teacher candidate has earned a grade of C or better in any or all Approaches or Models of Teaching courses.”

TEXAS EDUCATOR STANDARDS

Download and familiarize yourself with the specific standards for Math and Science (EC-4), Technology as well as for Pedagogy and Professional Responsibilities. These standards are the framework used to design the Texas Examinations of Educator Standards (TEXES).

<http://www.sbec.state.tx.us/SBECOnline/standtest/edstancertfieldlevl.asp>

EC 4403 Standards Addressed

Science Standards	Mathematics Standards	Technology Standards	Diversity Standards
Standard I: 1.2k, 1.4k; 1.1s, 1.6s	Standard I: 1.1s, 1.2s, 1.4s, 1.5s, 1.8s, 1.11s, 1.12s	Standard I: 1.1k, 1.2k; 1.s, 1.3s, 1.6s, 1.8s, 1.10s	Under Pedagogy & Professional Responsibilities: 1.5k, 1.5s; 2.1k; 3.3k, 3.3s; 4.1s
Standard II: 2.2k, 2.4k, 2.5k, 2.6k; 2.1s, 2.2s, 2.6s, 2.8s, 2.9s, 2.10s	Standard II: 2.1s, 2.2s, 2.4s, 2.7s	Standard II: 2.1k, 2.2k, 2.3k; 2.1, 2.3s, 2.8s	Under Science: 4.11s; 6.2k, 6.9k, 6.6s
Standard III: 3.2k, 3.5k; 3.1s, 3.2s,	Standard III: 3.1s, 3.2s, 3.3s, 3.4s, 3.5s, 3.6s	Standard III: 3.1k, 3.2k; 3.1s, 3.2s,	

<p>3.3s, 3.4s, 3.6s, 3.7s, 3.8s</p> <p>Standard IV: 4.3k, 4.4k, 4.8k 4.13k; 4.1s, 4.3s, 4.10s, 4.11s, 4.12s</p> <p>Standard V: 5.3k, 5.4k, 5.8k; 5.1s, 5.3s</p> <p>Standard VI: 6.2k, 6.9k, 6.10k; 6.2s, 6.6s</p> <p>Standard VII: 7.3k, 7.4k, 7.5k; 7.4s</p> <p>Standard VIII: 8.1k, 8.2k, 8.3, 8.4k; 8.1s, 8.3s, 8.4s, 8.8s, 8.9s</p> <p>Standard IX: 9.1k, 9.2k, 9.3k, 9.4k, 9.5k, 9.6k; 9.1s, 9.2s, 9.3s, 9.4s, 9.5s, 9.6s, 9.7s, 9.8s, 9.9s</p> <p>Standard X: 10.1k, 10.2k, 10.3k, 10.6k, 10.7k; 10.1s, 10.2s, 10.3s, 10.4s, 10.5s, 10.7s, 10.8s</p> <p>Standard XI: 11.1k, 11.3k, 11.5k;11.1s</p>	<p>Standard IV:4.1s, 4.2s, 4.6s, 4.7s</p> <p>Standard V:5.2k, 5.3k, 5.5k, 5.6k, 5.7k; 5.1s, 5.4s, 5.7s, 5.8s, 5.9s, 5.13s, 5.18s, 5.20s, 5.22s</p> <p>Standard VI: 6.2k, 6.3k, 6.5k; 6.1s, 6.2s, 6.4s, 6.5s, 6.6s</p> <p>Standard VII: 7.1k, 7.2k, 7.3k, 7.7k, 7.9k, 7.10k, 7.14k, 7.15k, 7.16k; 7.1s, 7.2s, 7.3s, 7.6s, 7.7s, 7.8s, 7.11s, 7.14s, 7.19s, 7.20s, 7.21s</p> <p>Standard VIII: 8.1k,8.5k;8.1s, 8.3s</p> <p>Standard IX:9.3s</p>	<p>3.10s, 3.14s</p> <p>Standard IV:4.1k, 4.2k, 4.3k;4.1s, 4.4s, 4.6s, 4.7s, 4.10s, 4.12s</p> <p>Standard V: 5.2k, 5.3k, 5.7k; 5.1s, 5.2s, 5.3s, 5.4s, 5.7s, 5.8s, 5.9s, 5.14s, 5.15s, 5.16s</p>	<p>Under Mathematics: 6.2k, 6.2s, 6.5s; 7.2k, 7.3s, 7.21s</p> <p>Under Technology: 5.2s</p>
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Diversity – A UTSA Core Value

The University of Texas at San Antonio (UTSA) is committed to the success of every student, staff and faculty member – on campus, at work and in life. For all members of our university community to excel, we must preserve freedom of thought and expression and promote a climate of respect that honors the rights, safety, dignity and worth of every individual. We choose to be members of this community and pledge our respect for the well-being of all its members.

To further strengthen our wonderful UTSA community, we affirm the following values:

RESPECT. We respect the dignity, worth and contribution of all individuals.

INCLUSIVENESS. We include people of every race, culture, ethnicity, ability, religion, gender, sexual orientation and socio-economic status, and we include a diversity of ideas and points of view.

RESPONSIBILITY. We take responsibility for struggling against and eliminating hate, injustice, discrimination, harassment, bigotry, violence or intimidation of any kind.

SELF-EXAMINATION. We examine our own biases and struggle against racism, sexism, homophobia and other forms of oppression.

CIVILITY. We recognize differences among people as a natural thing and see each new experience working with diverse groups as an opportunity to be better than we were before. We listen, and when we disagree, we work to resolve all disagreements with integrity.

INTEGRITY. We practice personal and academic integrity and value service, citizenship and leadership.

CELEBRATION. We celebrate all of the many backgrounds, experiences, similarities and differences among members of the university community.

For all our differences, we share one world.

To embrace diversity is to welcome the differences and delight in the sharing.