Science Education Topics I

SCIENCE, MATHEMATICS, AND TECHNOLOGY EDUCATION 4270
M 12-2
Science and Engineering (EN) 201

INSTRUCTOR: Cherie A. McCollough, Ph.D.
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Students may make appointments to see me at times other than those listed above. If I am unavailable or need to relocate during office hours, I will post a note on my office door.

REQUIRED MATERIALS:
1. Textbook: *Understanding by Design*; Wiggins and McTighe 2005
   National Research Council

OTHER RESOURCES: The instructor will make additional learning resources (e.g., books, handouts, reserve articles, software, websites) available during the semester. You will be given information about these resources. In addition, invited speakers may address various topics during this class.

COURSE DESCRIPTION: Presentations of contemporary issues in science education. Topics include history of science education, state and national standards for science education, cognitive development, the importance of culture, language and gender in learning science, authentic assessment, and interdisciplinary curriculum.

Additional Course Information: This course involves the students in a wide range of methods and materials designed to portray the teaching of science as a student-centered experience. The science teacher is urged to design courses for students in order to serve their personal needs and responsibilities for society and career decisions.

The course is centered upon the recent publication of National Academy of Sciences “How People Learn” and will consider theories of learning in science in light of understanding and advancing students’ learning, classroom interactions, and the organization of schools.

The course will provide experiences that will respect cultural diversity, and provide activities that will draw upon the cultural diversity implicit in the content being presented as well as providing for differences in such factors as gender, ethnic membership, academic ability and background.
The student is required to demonstrate knowledge of assigned readings, subjects discussed in class, and current trends in science education. The creation of a workable format for daily plans, unit plans, resource units and pencil-paper examinations is expected.

The student is expected to develop an attitude that is more than knowledge of facts about our world and universe, but it is also a way of thinking. Recognizable interest in associating science with all other areas of knowledge is considered. Interested in continued professional growth is strongly encouraged.

To prepare students for the 21st century, it is clear that an understanding of the principles and practice of science is an essential goal for students. Teaching science through inquiry approach is central to the course. Students will learn to deal with discrepancies, to raise and answer questions, and to use inquiry skills in defining and resolving problems. The inquiry model used in this course will consist of a series of non-linear steps as outlined by the How People Learn (NRC, 2000). Please see the course schedule for the outline of topics to be covered.

**STUDENT LEARNING OUTCOMES**

Students will:
- Use the Texas Essential Knowledge and Skills (TEKS), *How People Learn Framework* (NRC) criteria to plan a unit of study.
- Outline a science unit of study appropriate for target grade level that is based on inquiry and student centered teaching.
- Learn the importance of culturally relevant teaching and use family learning events as an example of culturally relevant teaching; participate in a family learning event.
- Research current issues in science education including subjects such as accountability and high-stakes testing, educational equality, assessment and tracking in schools, culturally relevant science teaching and classroom management challenges.
- Conduct classroom presentations using appropriate design and incorporating reflective questions for students to answer regarding that content.
- Attend Family Science Learning Events as outlined in the course schedule and present a culturally relevant science activity as discussed in class.
- Organize and create a classroom science lesson to be given in an area school under the supervision of the supervising teacher choice as per outlined during class discussion of this assignment.

**ATTENDANCE POLICIES:** Students are expected to attend every scheduled class and laboratory meeting. Family vacations and celebrations of your 21st birthday are worthwhile, but are not classified as excused absences. If you book an airplane flight which conflicts with class, I do NOT consider that to be an excused absence. Routine events should be scheduled to avoid class conflicts. In general, only unavoidable absences are excused (major family illness or accidents, deaths, funerals).

I WILL BE TAKING ATTENDANCE AT EACH CLASS. STUDENTS ARE GIVEN ONE UNEXCUSED ABSENCES PER SEMESTER FOR THIS CLASS. AFTER THAT ABSENCE, THEY WILL RECEIVE A 10% DROP IN THEIR FINAL LETTER GRADE FOR EACH ADDITIONAL UNEXCUSED ABSENCE. LEAVING CLASS EARLY/ARRIVING LATE FOR CLASS WILL COUNT AS ½ ABSENCE.
Points missed because of an unexcused absence (including tardiness and leaving early) cannot be recovered. An excused absence allows us to make alternative arrangements for completing assignments. The documentation required for an absence to be excused must be…

- from an appropriate source (e.g., doctor, dentist, funeral director) who states the nature of the event that caused (or will cause) your absence.
- in writing, on official stationary, and signed. (I do not return excuses to you.) Telephone calls, FAXes, and e-mails are not acceptable.
- presented prior to the absence for a scheduled event (e.g., university-sponsored activity, recognized religious holiday, military service).
- presented no more than one week after the date of an unexpected absence.

Unacceptable Excuses: Only unavoidable absences are excused (see above), so you should schedule routine personal events (e.g., vacations, wedding, reunions, non-emergency medical or dental visits, parent-teacher conferences, household or auto repairs) to avoid conflicts with your classes. Oversleeping is never an acceptable excuse. Employment conflicts are not acceptable excuses for absences, tardiness, or leaving class early. Texas waves jury duty for students, so jury duty is not an acceptable excuse. If you arrange to take any test at an alternate time and do not show for that appointment, then you forfeit the opportunity to take the test except at its originally scheduled time.

It is the responsibility of the student to obtain any material missed during an absence from his/her classmates. It is always your responsibility to determine what happened in class or laboratory during your absence. If you are absent, you must obtain any handouts or assignments from me in my office on your own time: I rarely bring assignments to class more than once. You must obtain class notes from other students.

Special circumstances may warrant deviating from these guidelines (including administering a “make-up” examination) and will be refereed to the Vice President of Student Affairs. This also applies to any situations for which you cannot provide an acceptable excuse as outlined above.

Scholastic dishonesty will not be tolerated. All students are expected to conform to college level standards of academic integrity and quality of work (this includes spelling and grammar where applicable). Additional general guidelines that may be of interest to the student can be found in the “General Academic Policies and Regulations” section of the 2005 – 2006 TAMUCC undergraduate catalogue as well as the “The Student Code of Conduct”. In cases involving a academic dishonesty as defined by the Student Handbook, proceedings that have been outlined in the current academic undergraduate Texas A&M University – Corpus Christi catalog will be followed.

Except in cases were prior arrangements have been made with the instructor for university approved absences, there is NO provision for making up late work and/or missed exams and quizzes. Anyone arriving after someone has completed an examination and left the room will not be allowed to take that examination. If you leave an examination room, for any reason, you must hand in your answer sheet and you will not be allowed to resume the examination. In the event of an examination that is missed, regardless of circumstances regarding illness, absenteeism, death in the family, etc., NO make-up examinations will be administered as that grade will be dropped if it is the lowest grade.

***Please turn off all cell phones, beepers, Palm Pilots, etc., before entering the classroom or laboratory, or at least place them on silent mode.
Disability and Veterans’ Services: Texas A&M University-Corpus Christi is committed to providing persons with disabilities an equal opportunity to access campus facilities, resources and programs. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. Support and accommodations are also available for returning veterans who experience cognitive and/or physical access issues in the classroom or on campus. Our Office of Disability Services arranges such support and academic accommodations. To make a request, or for more information, call (361) 825-5816 or visit Driftwood 101. It is important to contact the Office of Disability Services in a timely fashion as it will take time for them to review requests and prepare accommodations and accommodation letters.

Disabilities: The Students with Disabilities Center is located in the Student Services Center (361.825.5816). If you have special needs, please contact this center. I cannot make modifications without the center’s involvement, even if you show me your IEP. If you have mobility problems, please notify me so that assistance can be given in case of fire drills or emergencies.

This syllabus is a draft in progress: the instructor reserves the right to modify it’s contents. While the instructor will attempt to notify all students of any changes, it is ultimately the students responsibility to keep appraised of those modifications/changes/additions/deletions/etc.

The attached schedule is TENTATIVE – any changes in this schedule that are announced during class become the responsibility of the student. PLEASE keep appraised of schedule changes if you are absent! YOU are responsible for YOUR grade!

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Insurance Policy: Often, students are a few points from the next highest letter grade. If a student attends an optional family learning event, judges at a local science fair (I will make this information available) or attends another event that is announced by the instructor (we often have guest speakers give talks on campus), they must provide documentation from an administrator of this event and will receive insurance credit. If a student has attended one or more of these events, they may receive up to 10 points of credit if they are within 10 points of the next letter grade at the end of the semester. Otherwise, that student will receive the grade they have earned, even if it is just one point less than the grade required for the next highest letter grade. No documentation for any event will be accepted after the last class day! NO EXCEPTIONS!
# EVALUATION

PLEASE NOTE: EMAILED ASSIGNMENTS WILL NOT BE ACCEPTED. Type-written assignments are due in class at the beginning of class. Late assignments will NOT be accepted!

Points will be awarded for the following:

1. Homework Assignments – completed assigned questions – 9 assignments @ 25 points each  
   **225 points**

2. Science Teaching Experience Reflection  
   **100 points**

3. Classroom Action Research Report  
   **100 points**

4. Family Science Reflections – 100 points each  
   **200 points**  
   *attendance mandatory at 2 events or 100 points deducted from final grade for each missed event.*

5. Family Science Project Peer Evaluation  
   **50 points**

6. Evolution Paper  
   **25 points**

7. Family Science Lesson Plan  
   **100 points**

**Total: 800 points**

Scale:

- A = 90%
- B = 80%
- C = 70%
- D = 60%
- F = less than 59%