Foundational Approaches to the Biological Sciences

SCIENCE, MATHEMATICS, AND TECHNOLOGY EDUCATION 3316
Section I: MW 10:00-11:50 (SMTE 3316.001/101)
Section II: TR 2:00-3:50 (SMTE 3316.002/102)

INSTRUCTOR:
Cherie A. McCollough, Ph.D.
Office Location: Science and Technology (ST) 310A
Office Phone: (361) 825-3166
Office Hours: MW 9-10; TR 1-2 & by appointment
E-mail: Cherie.McCollough@tamucc.edu

Students are welcome to 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. You are welcome to come by my office at other times and if I am not busy, I would be happy to help you. A phone call or email is usually the best way to coordinate seeing me outside of office hours.

REQUIRED MATERIALS:
1. TAKS Reader: An interactive Student Textbook – McGraw-Hill Glencoe
2. SMTE 3316 Foundations of Biological Sciences by C. McCollough course packet (available in Islander bookstore – not available at Barnes and Noble)

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.

COREQUISITE: Laboratory Safety Seminar – Physical Science (PSCI) 0091. You must pass this web-based course this semester to be allowed to take SMTE 3316. Log on to your WebCT account to take the course.

COURSE DESCRIPTION: Emphasis on teaching biological concepts including cells, plants, vertebrate and invertebrate structural systems, cell biology, ecology, and other concepts relevant for K-8 science classrooms and associated with the Texas Essential Knowledge and Skills (TEKS). Instruction regarding pedagogical foundations are those that are contained in the Science Content Standards and Science Teaching Standards as prescribed by the National Science Education Standards, the National Science Teachers Association and the Texas Education Agency.
STUDENT LEARNING OUTCOMES: The student will:
1. compare and contrast plant and animal cells and tissues
2. demonstrate ability to use the microscope
3. classify organisms as bacteria, protists or fungi
4. identify basic plant structures
5. outline a variety of plant life processes
6. describe the basic life processes of animals
7. discuss the scientific foundation of evolutionary processes.
8. describe general classification of animals
9. demonstrate the use of the scientific method in problem solving
10. describe/demonstrate/discuss the theoretical and pedagogical methods in teaching the above material to elementary and middle school students. Such methods are according to the NSES, NSTA, TEA and other professional organizations that prescribes methods that are based on scientific research.
11. 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.

Course Requirements and Grading Criteria:
The student will be expected to:
- attend and participate in classroom and laboratory activities
- read textbook assignments prior to class
- take examinations
- participate in developing presentations and projects while working both collaboratively and alone.
- correlate laboratory and other activities with the Texas Essential Knowledge and Skills (TEKS).
- Write original, research-driven, learner-centered classroom and laboratory exercises based on units of instruction that follow guidelines of the No Child Left Behind Act of 2001, as well as TEKS or other state guidelines.
- Design, write, and direct (as an individual) lesson plans on a scientific topic of his/her own choosing as approved by the instructor, and revise the lesson plans based on instructor and peer comments.
- Model appropriate and approved practices in managing a laboratory setting, including basic laboratory skills.
- Create a presentation and participate in Family Learning Events.

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.

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.

**EVALUATION**

Points will be awarded for the following. Please refer to handouts for rubrics, criteria, and
examples of completed assignments and examinations in order to identify expectations for
these assignments. Every student should have a clear idea of expectations prior to
completion of the following assignments/test administration. Any and all questions
regarding expectations should be immediately referred to the instructor. Please do not
wait until the day before the assignment is due to ask questions!

**NO E-MAILED ASSIGNMENTS WILL BE ACCEPTED! HARD
COPIES MUST BE SUBMITTED WHEN DUE TO RECEIVE CREDIT!**

1. Four examinations @ 200 points each 800 points**

2. Family Science Reflections (3 @ 100 points each) 300 points

(Attendance at 3 family science events mandatory – if absent, 100 points will be
deducted from your final grade!)

3. Family Science Project Peer Evaluation 50 points

4. Candle Laboratory 25 points

5. Inconvenient Truth/Oh Deer/Evolution paper
   25 points each

5. Annenberg Videos (2 @ 50 points each) 100 points

**Total:** 1350

Scale:

A – 90 – 100%
B – 80 – 89%
C – 70 – 79%
D – 60 – 69%

**Missed Exams – excused only per TAMUCC guidelines; such exams are
given only under EXTREME circumstances and will be total essay.**
**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 student’s responsibility to keep appraised of those substitutions/changes/additions/deletions/etc.

***Please turn off all cell phones, beepers, Palm Pilots, etc., before entering the classroom or laboratory, or at least place them on silent mode.***

**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.

**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.

**Grade Appeals:** As stated in the Texas A&M University-Corpus Christi University Rules and Procedures (Section B [Academic Program], Part 13 [Students]: 13.02.99.C2 [Student Grade Appeals] and 13.02.99C2.01 [Student Grade Appeal Procedures]), a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is on the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, consult the University Rules and Procedures specified above (accessible through the University Rules and Procedures website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html)). For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.
<table>
<thead>
<tr>
<th>DATE</th>
<th>Time: CLASS</th>
<th>Time: LAB</th>
<th>READING AND OTHER ASSIGNMENT DUE</th>
<th>WRITTEN ASSIGNMENT DUE</th>
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<tbody>
<tr>
<td>Aug 25/Aug 26</td>
<td>Syllabus, Expectations, Draw a Scientist, Pre-test</td>
<td>Foundations: How People Learn and HPL classroom lessons</td>
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<td>Aug 30/Aug 31</td>
<td>A. Beliefs about Science B. FOUNDATION II: Inquiry and Standards of Science Education</td>
<td>Candle Lab</td>
<td>Hart/Winston Article; NSTA Principles of Professionalism</td>
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<td>Sept 1/2</td>
<td>Family Science and Culturally Relevant Teaching</td>
<td>Family Science Projects Selection/ Committee Delegation</td>
<td>Coursepack Readings - Family Science Night</td>
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<td>Sept 6/7</td>
<td>Labor Day</td>
<td>No Class</td>
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<td>Sept 8/9</td>
<td>Evolution and Natural Selection(D)/ Teaching Evolution According to the State standards (E)</td>
<td>Evolution - Why Bother CD</td>
<td>Evolution - NSTA position statement (E 1-5)</td>
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<td>Sept 13/14</td>
<td>Ecology and Cycles (G)</td>
<td>An Inconvenient Truth</td>
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<td>Sept 15/16</td>
<td>Mitosis/Meiosis</td>
<td>Mitosis/Meiosis Lab</td>
<td>布里 FSN project idea (written) to class/Oh Deer Assignment Due</td>
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<td>Sept 20/21</td>
<td>Cell Theory/Cell Structure</td>
<td>An Inconvenient Truth</td>
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<tr>
<td>Sept 22/23</td>
<td>At Home Assignment</td>
<td>NO class</td>
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<td>Sept 27/28</td>
<td>Exam I</td>
<td>Family Science Construction</td>
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<tr>
<td>Sept 29/Sept 30</td>
<td>Classification and the Five Kingdoms</td>
<td>Family Science Construction</td>
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<td>Date</td>
<td>Topic</td>
<td>Notes</td>
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<td>Oct 7/8</td>
<td>Monera, Fungi, Microscopic Technique/ Monera and Fungi Slides</td>
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<td>Oct 11/12</td>
<td><strong>Family Science 1: OCT 13th (Tues)</strong></td>
<td>No Class, Gregory Portland Intermediate 5:00-7:00</td>
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<td>Oct 13/14</td>
<td>Protista, Viruses, Protist - Pondwater and Slide Exercises, Pondwater</td>
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<td>Oct 18/19</td>
<td>Porifera, Cnideria, Porifera/Cnideria Slide Exercises, Annenberg Video I Due</td>
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<td>Oct 20/21</td>
<td><strong>Exam II</strong></td>
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<td>Oct 25/26</td>
<td>Platyhelminthes, Mollusca, Annelida, Earthworm Dissection</td>
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<td>Oct 28</td>
<td><strong>Family Science 2: WEDNESDAY Oct 28</strong></td>
<td>No Class, Carroll Lane Elementary 5:00-7:00</td>
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<td>Nov 1/2</td>
<td>Arthropoda, Echinodermata, Starfish Dissection/Owl Pellets, Family Science Reflection Due</td>
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<td>Nov 3/4</td>
<td>The Chordates:Fish, Amphibians, Fish Dissection, Family Science Reflection II Due</td>
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<td>SATURDAY NOV 7</td>
<td><strong>Family Learning Institute</strong></td>
<td>TAMUCC - MSEC (round bldg by ECDC), SCHEDULE TBD: Approx 10-12 a.m.</td>
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<td>Nov 8/9</td>
<td>Reptiles, Birds, Owl Pellets, Family Science Reflection III Due</td>
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<td>Nov 10/11</td>
<td><strong>Exam III</strong></td>
<td>Mammals</td>
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<td>Nov 15/16</td>
<td>Muscular-Skeletal System, Respiratory System Lab, Annenberg Video II Due</td>
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<td>Nov 22/23</td>
<td>Circulatory/Respiratory Systems/ Heart Dissection, Heart Dissection</td>
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<td>Nov 24/25</td>
<td>Flowering plants, roots, stems, leaves, Slides, Flower Dissection</td>
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<td>Nov 29/30</td>
<td>Heredity and Mendel, Heredity Activity, Final Lesson Plan Due</td>
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<td>Dec 1/2</td>
<td><strong>Exam IV</strong></td>
<td>Field Research in Science, Evaluations/ Closure</td>
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<td>Dec 6/7</td>
<td>Last Class Day: Final Lesson Plans Due, Final Lesson Plan Due</td>
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Final Exam: 10:00 class: Date to be announced

Final Exam: 2:00 class: Date to be announced