

Biology 3300 – Survey of Basic Sciences



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Office hours: Monday – Thursday (Del Rio) 1:30pm – 3:00pm
or by appointment (or online by request)

Required Texts: Wikibooks.org Look for [Science: An Elementary Teacher's Guide](#) This is a free, open-source book authored by the students from the previous two semesters. You will be improving upon this book as you use it.

Student Learning Outcomes: There are seven broad goals for this course. Basic Survey of Sciences students will:

- Review and practice teaching theories and methodologies of elementary instruction as they pertain to elementary science.
- Demonstrate understanding of basic Physics principles such as matter, energy, light, sound, electricity and magnetism after discussions of such topics.
- Demonstrate understanding of Earth Science subjects such as weather, seasons, climate, and plate tectonics after discussions of such topics.
- Comprehend basic categorization and organization of animal, plant, and other life, after discussions of such topics.
- Comprehend basic organization and functioning of the human body, after discussions of such topics.
- Understand and be able to carry out a wide variety of demonstrations and experiments suitable for elementary students.
- Be prepared for the science-related questions on the TExES exam

Attendance and Participation:

Class will be a time of discussion, demonstration, and collaborative learning. I will provide links to some instructional videos on the various topics, plus you have your book and other resources, so come to class having already studied the topic of the day, thus leaving more time for demonstrations, question/answer, and collaborative learning. I will communicate by sending out announcements over Blackboard, so please check regularly (notices of announcements will be sent to your school email account).

This class has not changed for many years, but this semester we are abandoning the old textbook. Assignments and exams will be new. I need your help to make this a successful transition.

Semester Overview (exact dates and topics subject to change)

Tentative Lecture Schedule: 2-3 weeks per unit

Unit 1: Philosophy & Practice of Science

Unit 2: Physics

Unit 3: Chemistry

Spring Break!

Unit 4: Earth Sciences

Unit 5: Biology

Practice TExES exams

Final Exam Tuesday, May 9, 9:00 AM

I anticipate an exam for each unit, and one or more assignments for each unit as well. The nature of these exams and assignments has not yet been determined, but you can anticipate each of the 5 unit tests to count for 10% of your grade (50% total), the final will count as 15%, with assignments and other factors counting for the remaining 35% of your grade. Exam questions will be drawn from information presented in lecture, information from your textbook, and through additional assigned websites and readings. Exam questions will mainly be multiple choice, but some may be short answer or other style of questions.

Here are the state Science Generalist Standards this class is designed to meet

THEORY & METHODOLOGY

- Standard I:** manages classroom, field & laboratory activities to ensure the safety of all students & the ethical care & treatment of organisms & specimens
- Standard II:** the correct use of tools, materials, equipment & technologies
- Standard III:** knows & understands the process of scientific inquiry & its role in science instruction
- Standard IV:** has theoretical & practical knowledge about teaching science & about how students learn science
- Standard V:** knows the varied & appropriate assessments & assessment practices to monitor science learning
- Standard VI:** the history & nature of science

CONTENT & PROBLEM SOLVING

- Standard VII:** how science affects the daily lives of students & how science interacts with & influences personal & societal decisions
- Standard VIII:** the science content appropriate to teach the statewide curriculum skills (TEKS) in physical sciences
- Standard IX:** the science content appropriate to teach the statewide curriculum skills (TEKS) in life science
- Standard X:** the science content appropriate to teach the statewide curriculum skills (TEKS) in Earth & space science
- Standard XI:** the unifying concepts & processes that are common to all sciences
- Standard XI:** the unifying concepts & processes that are common to all sciences

Assignments and Other Points:

There will be short assignments throughout the semester, but you will also have opportunities to do your own extra work as part of your “learning portfolio.” Keep track of what you do so you can present it to me as part of your grade evaluation at the end of the semester. Here are some examples of things you might do:

Editing the New Textbook:

In addition to the taking tests, you can earn points by improving this class for the benefit of future students through the editing of our wikibook. *Meaningful* contributions spread across the semester will count for a lot more than a few quick changes made at the end of the semester!

Experiments and Activities:

As we learn the material, please be thinking of ways you can present these concepts to children. You can find a lot of great demonstrations of fun, cheap experiments. You could earn points by performing some of these experiments yourself, or (even better) helping a teacher carry them out in a classroom.

You could take pictures of a demonstration or experiment, upload them to Wikimedia Commons, and incorporate them into the book with instructions for others who want to do the experiment (maybe something simple, maybe a full-on lesson plan). Be thinking in terms of how you will actually use this material in your future classroom!

Making Study or Test Materials:

Maybe you would like to make some worksheets or study guides. Maybe you are good at writing test questions and want to add some multiple-choice quiz questions to the end of a chapter. If you make materials that you think will increase understanding of a subject, you are welcome to share with your fellow students.

Teaching Others:

The best way to learn a subject (and to figure out what you do not know) is to try teaching others. Create opportunities for yourself and document your efforts and the outcomes.

A Note on Grades and Extra Credit:

Grading gives me anxiety. It feels like I am judging you—I’m not, since I always want the best outcome for you, but I am judging your science skills and knowledge. Giving tests and assigning grades is a tough part of my job. If you do not demonstrate enough understanding of science, I’m the mean guy who has to keep you out of the education program! But think about it—our country is already suffering from lack of science education, and it would be terrible if you and I contributed to the problem when we can instead be part of the solution. So if I give you an “F” or a “D,” it just means you don’t get to walk through the next door quite yet—stay and learn more so when you do walk through you are really ready. Even if you love the class and even if you are my favorite student ever, I will not hesitate to give you an “F” if you have terrible test scores. Test scores are only weak indicators of how well you have learned something, but they are still useful and can clarify your misunderstandings. They are also useful to justify why I gave this student a “C” and this other student a “B.”

Can you improve your understanding after a test? Yes. Can you *demonstrate* your learning? In other words, if your test scores say “C” and you think you deserve a “B,” don’t ask for extra credit—it is up to you to do extra work (see above for ideas), document your work, and convince me that your understanding of the science exceeds your test scores.

Americans with Disabilities Act (ADA):

Sul Ross State University is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartz, M. Ed., L.P.C., in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8691. E-mail: mschwartz@sulross.edu

If you are an ESL student, please contact me to make arrangements for use of foreign language dictionaries and translators.

Academic Honesty:

Cheating will not be tolerated. The University expects all students to engage in all academic pursuits in a manner that is above reproach and to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. "Cheating" includes, but is not limited to:

- Copying from another student's test paper, a laboratory report, other report, or computer files, data listings, and/or programs.
- Using, during a test, materials not authorized by the person giving the test.
- Collaborating, without authorization, with another person during an examination or in preparing academic work.
- Knowingly, and without authorization, using, buying, selling, stealing, transporting, soliciting, copying, or possessing, in whole or in part, the contents of an unadministered test.
- Substituting for another student; permitting any other person; or otherwise assisting any other person to substitute for oneself or for another student in the taking of an examination or test or the preparation of academic work to be submitted for academic credit.
- Bribing another person to obtain an unadministered test or information about an unadministered test.
- Purchasing, or otherwise acquiring and submitting as one's own work any research paper or other writing assignment prepared by an individual or firm. This section does not apply to the typing of the rough and/or final versions of an assignment by a professional typist.

Plagiarism will not be tolerated. "Plagiarism" means the appropriation and the unacknowledged incorporation of another's work or idea into one's own work offered for credit. This includes verbatim written answers by colleagues with whom you might discuss laboratories exercises. Plagiarism also includes copying information from internet resources. To avoid plagiarism, make sure you always use your own words to construct your written answers.