

Biology 3300 – Survey of Basic Sciences Winter 2016

Instructor: Dr. Kevin V. Young
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Office hours: Monday - Thursday: 10:00am – 12:00pm
Friday: by appointment

Required Texts: Tolman, Marvin N. 2002. Discovering Elementary Science: Methods, Content and Problem-Solving Activities, 3rd Ed. Allyn & Bacon, Boston, MA 560 pp.

Course Objective: There are six broad goals for this course:

- Basic Survey of Sciences students will review teaching theories and methodologies of elementary instruction as they pertain to elementary science.
- Basic Survey of Sciences students will know and comprehend such basic physics principals as light, sound, energy, matter, electricity and magnetism after discussions of such topics.
- Basic Survey of Sciences students will know and comprehend such basic Earth science subjects as weather, seasons, climate, and plate tectonics after discussions of such topics.
- Basic Survey of Sciences students will know and comprehend basic categorization and organization of animal life, after discussions of such topics.
- Basic Survey of Sciences students will know and comprehend basic categorization and organization of plant life, after discussions of such topics.
- Basic Survey of Sciences students will know and comprehend basic organization and functioning of the human body, after discussions of such topics.

Attendance:

This is an upper division college course. You are an adult, and you paid for this course. I will not be taking roll call. However, material for the exams will come largely from my lectures, notes and textbook and assigned web page readings, so it is in your best interest to participate in class.

Tentative Lecture Schedule

(Note: exact dates are subject to change; be sure to keep abreast of changes).

Date	Topic	Readings
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UNIT 1—THEORY & METHODOLOGY

During the following 3 weeks the following Science Generalist Standards will be addressed:
The science teacher:

- Standard I:** manages classroom, field & laboratory activities to ensure the safety of all students & the ethical care & treatment of organisms & specimens
- 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

Week 1 (Jan 25)	Introduction, Syllabus, Principles of Learning	Chapter 1 & 2
Week 2 (Feb 1)	Problem Solving & Research	Chapter 3
Week 3 (Feb 8)	Questioning	Chapter 4

UNIT 2—CONTENT & PROBLEM SOLVING

SECTION 1 – PHYSICAL SCIENCES

During the following 6 weeks the following Science Generalist Standards will be addressed:
The science teacher knows & understands:

- Standard VI:** the history & nature of science
- 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 XI:** the unifying concepts & processes that are common to all sciences

Week 4 (Feb 15)	Exam I (Chapters 2, 3, & 4) Energy & Matter	Chapter 13
Week 5 (Feb 22)	Heat	Chapters 14
Week 6 (Feb 29)	Light & Electromagnetic spectrum	Chapter 15
Week 7 (Mar 7)	Exam II (Chapters 13, 14 & 15) Sound	Chapter 16
Week 8 (Mar 14)	Electricity and Magnetism	Chapter 17
Week 9 (Mar 21)	Machines. 1st Lesson Plan due	Chapter 18

SECTION 2 – EARTH & SPACE SCIENCE

During the following 3 weeks the following Science Generalist Standards will be addressed:
The science teacher knows & understands:

- Standard II:** the correct use of tools, materials, equipment & technologies
- Standard VI:** the history & nature of science
- Standard VII:** how science affects the daily lives of students & how science interacts with & influences personal & societal decisions
- 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

Week 10 (Mar 28)	Exam III (Chapters 16, 17 & 18) The Environment	Chapter 9
Week 11 (Apr 4)	Weather, Seasons & Climate	Chapter 19
Week 12 (Apr 11)	The Earth	Chapter 20

SECTION 3-LIFE SCIENCES

During the following 3 weeks the following Science Generalist Standards will be addressed:
The science teacher knows & understands:

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

Week 13 (Apr 18)	Exam IV (Chapters 9, 19 & 20) Animals	Chapter 10
Week 14 (Apr 25)	Plants. 2nd Lesson Plan due. <i>Thanksgiving Holidays (November 26-28)</i>	Chapter 11
Week 15 (May 2)	The Human Body	Chapter 12
Week 16 (May 9)	Final Exam (4:00 pm – 6:00pm) (50% Chapters 10, 11 & 12; 50% Comprehensive)	

Grade assessment:

There will be **4 lecture** examinations. These four lecture exams will each be worth 100 points. Additionally, there will be a mandatory comprehensive final exam worth 150 points.

Assignments:

In addition to the tests, you are expected to develop **two lesson plans** during the semester, and to **present one lesson** to a class of any grade level at an elementary school. Each lesson plan will be worth 50 points, and you will get an additional 50 points for presenting at the school. You may work in groups of up to 3 students for these assignments, but you must also change groups between assignments.

Therefore, there are a total of 700 possible points during this course:

4 regular semester exams	400
Final exam	150
2 Lesson Plans	100
Presentation at School	50
Total	700

Your final grade in this course will be determined by the cumulative number of points you earn. Your final grade will be determined by the following scale:

<u>Total points</u>	<u>Percent</u>	<u>Letter Grade</u>
630 – 700	90 – 100%	A
560 – 629	80 – 89.9%	B
490 – 559	70 – 79.9%	C
420 – 489	60 – 69.9%	D
000 – 419	< 60%	F

Questions will be drawn from information presented in lecture, information from your textbook, and through occasional class notes, handouts or additional assigned readings. Exam questions may consist of a few definitions or vocabulary/concepts, multiple choice questions and short essay questions. No notes, books, cell phones, PDA's, or other materials will be allowed during the exam. I will provide an English dictionary for your use if necessary. If you are an ESL student, please contact me to make arrangements for use of foreign language dictionaries and translators.

Assignments: This is my first time assigning lesson plans and I do not have a concrete idea of what a lesson plan should look like. It should be fun and engaging for the children, it should teach correct science principles, it should challenge the children to think in new ways, and it should include not just a presentation but also activities for the children, additional resources for the teacher, etc. You should feel good about giving the teacher you visit a copy of your full lesson plan.

Extra Credit

There will be **NO** opportunities for extra credit, so don't even ask!

Study Tips:

Everyone has their own unique way of learning. How you study rather than how long you study will have a huge impact on your grade in this course. If you use all the resources available to you and take an active role in the learning process you will likely do much better. Some specific tips are:

- Spend 15 – 20 minutes to skim through each reading assignment before class.
- Review the lecture notes and read the assigned reading
- Try to draw diagrams from lecture and the book from memory
- Make flash cards or important concepts and terms
- Call up a friend and try to explain what you have learned in class
- ASK QUESTIONS! You are not in this class alone, if you don't understand something, more than likely your classmates also don't understand.

Disabled Students:

Reasonable accommodations will be provided for students with disabilities. Please meet with me the first week of class to discuss any special needs you may have.

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.