

Biology 101 – Liberal Studies

Fall 2009 Syllabus - Revised to account for furloughs

Faculty: Dr. Irene Salter

Office: Holt 341

Phone: 898-6340

E-mail: isalter@csuchico.edu

Office Hours: _____ or by appointment

Quick Chat (<10 min): Before or after any lab

Required texts:

- Krough, D. A Brief Guide to Biology with Physiology, Pearson/Prentice Hall
- BIOL101 Concepts of Biology Laboratory Manual – for Liberal Studies (available through Omicron in Holt Hall 2nd floor beside the mountain lion)
- Science notebook – a 70-100 page spiral notebook **dedicated** to the activity portion of this course (please keep your lecture notes in a separate location)

Goals of the Course:

This is NOT your traditional college biology course. The goal of this course is to give you mastery over the concepts required of K-8 students in California in a hands-on, experiential way. By the end of the course, you will hopefully gain a deep understanding of the major key concepts that are the foundation of biology – deep enough for you to teach kids about them if that is your eventual career goal. Do not expect to spend a lot of time listening to me talk at you while you take notes. Most of the time, you will be actively engaged in observing, experimenting, discovering, discussing, and building models during both “lecture” and “lab” sections. Through your own explorations, you will develop an understanding of the biology concepts that lay beneath what you observe. We will also spend a significant portion of the course discussing and analyzing how people (including young children and yourselves) learn about biology. Most of the activities you will take part in come directly from my former middle school science classroom. If you wish to use these activities in your own classrooms someday, then lesson plans can be found at my website: <http://www.mysciencebox.org>. Many of the videos showing children learning the same concepts as we are may be viewed online for free at <http://www.learner.org/channel/courses/essential/life/>

Throughout the course, you will experience and learn about every life science concept listed in the K-8 California Science Content Standards. In fact, these standards contain every big idea you will be expected to master by the end of the class. These include:

- Ecology – living things interact with each other and with their environment
- Structure and Function – all living things have structures that are suited to accomplish specific functions
- Evolution – the diversity of living things on the planet is the result of evolution taking place over a long period of time
- Chemistry of Life – living things have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA
- Cell Biology – all living things are made of cells which carry on all the processes needed to sustain life
- Genetics – cells contain DNA which provides the genetic instructions necessary to run the cell and the whole organism
- Investigation and Experimentation – the foundation of science is inquiry, the use of observation, experimentation, and discussion to learn about the world

Date	L/A	Topics	Assignments (Assignments are due the next class meeting unless otherwise indicated)
Aug 24	A1	Course overview, What is science, Designing experiments & Measuring and observing lab	Water bottle (Aug 28) HW1 What do plants need? (Aug 28)
Aug 25	L1	Ecosystem structure & Food chains	p 389-91 HW2 Critter Research (Aug 31)
Aug 28	A2	What plants need, Set up Terraqua columns & Outdoor explorations	
Aug 31	A3	Critter presentations (P2), Food webs & Gone fishin'	HW3 Food Chain Decision & Vista discussion p 442 essay
Sep 1	L2	NO CLASS - required Vista web-lecture on Energy & Food webs	p 95-97, 423-27
Sep 4	A4	NO CLASS	
Sep 7	A5	LABOR DAY HOLIDAY – NO CLASS	
Sep 8	L3	NO CLASS - required Vista web-lecture on Atoms, molecules, and chemical reactions	HW4 Matter? Molecules? p 15-22, 8-10, 60-61
Sep 11	A6	Matter? Molecules? & Energy from food	Reread p 425-426 (esp Figure 24.13)
Sep 14	A7	Worm bins and Decomposition & Rotten log lab	Begin decomposition experiments (Oct 30)
Sep 15	L4	Matter from food & Digestive system	p 524-530
Sep 18	A8	Matter cycles & Carbon cycle game	p 415-423 Midterm #1 given (Sep 25)
Sep 21	A9	Skull lab & chicken's foot dissection	p 459-462
Sep 22	L5	Reproductive system & Animal life cycles revisited	Plant experiment presentations p 449-456, 538-555
Sep 25	A10	MIDTERM DUE , What plants need experiment presentations (P1) & Plant life cycles	
Sep 28	A11	Diffusion, Lung models & Heart dissection	HW5 Organ research (Oct 5) p 513-524
Sep 29	L6	Nervous system & the eye	
Oct 2	A12	NO CLASS	Organ research reminder p 83-86, 530-534
Oct 5	A13	Organ research presentations (P4) & Water spinners	HW6 What is life?
Oct 6	L7	The characteristics of life	p 31-37
Oct 9	A14	Flower dissections, Begin who's your daddy & Begin life traps	p 559-569 Prep science notebook
Oct 12	A15	9 AM NOTEBOOK CHECK , Observe who's your daddy plants, Check life traps, About fungi and bacteria & Microscope observations	p 336-339, 351-354 (SKIP essay 20.1 on p 337)
Oct 13	L8	Cell parts and functions	p 55-75 Bring Model Cell materials

Date	L/A	Topics	Assignments (Due Date)
Oct 16	A16	11 AM NOTEBOOK CHECK , Pollinate who's your daddy plants & Model cells (P5)	Update Plant/Animal KWLH (Nov 3)
Oct 19	A17	2 PM NOTEBOOK CHECK , Pollinate who's your daddy plants & Molecule testing	P 38-53
Oct 20	L9	Photosynthesis – part 1	P 123-125
Oct 23	A18	Photosynthesis – part 2, Pollinate who's your daddy plants, Bubbling plants & Starch testing	
Oct 26	A19	Cellular respiration & Classifying living things video discussion	P 98-100, 107-108, 112 Update Plant/Animal KWLH (Nov 3)
Oct 27	L10	Photosynthesis vs respiration & What do plants do more?	Decomposition experiment presentation reminder
Oct 30	A20	Worm bins & decomposition presentations (P3) Cell energy lab – part 1	HW7 Plants vs. animals comparison
Nov 2	A21	NO CLASS	Midterm #2 (Nov 9)
Nov 3	L11	Cell energy lab – part 2 (P6)	
Nov 6	A22	DNA extraction & Is it Alive? – part 1	p 137-140
Nov 9	A23	MIDTERM #2 DUE , Is it Alive? – part 2 (P7) & DNA models	P 203-211 HW8 Trait survey (Nov 16)
Nov 10	L12	NO CLASS - required Vista web-lecture on Secret codes	HW9 Unscramble pictures p 228-229 essay
Nov 13	A24	Mitosis & Meiosis	HW10 Mendel's data p 141-145, 375-8
Nov 16	A25	Mendel & Making babies	p 167-175
Nov 17	L13	Protein factory	p 215-223
Nov 20	A26	Isopod variations (P8)	
THANKSGIVING BREAK – NOV 23-27			
Nov 30	A27	Complete Who's your daddy & Bird beak buffet	
Dec 1	L14	Darwin and evolution	p 253-262
Dec 4	A28	What are mutations?	P 209-211
Dec 7	A29	Evidence for evolution & Breeding cats	Finish science notebook p 262-267
Dec 8	L15	NOTEBOOKS DUE , Misconceptions about Evolution	
Dec 11	A30	Review	Study for Final!
FINAL EXAM – THURSDAY DEC 17 10-11:50			

Course Expectations and Policies:

- **Attendance is mandatory for both lectures and activities.** You must be there and you must participate in order to learn what is required to do well in this course. There is a sign-in sheet that will circulate the room during every lecture and lab. A head count will also be performed. Failure to attend regularly (4 or more un-made-up absences) will result in an automatic “F” regardless of your grades.
- **Make up policy.** If you know in advance that you will not be able to attend a class, let me know ASAP and plan to come to my office hours to make up the missed material within a week. If you **MISS** a lecture, lab, or exam, be aware that I will only schedule make up sessions (including a make up exam) for a “serious and compelling” reason such as a serious illness, death in your immediate family, etc. If you have a valid reason and if you contact me within 48 hours of your absence, then I **MAY** schedule a time for you to make up the material.
- **Be on time. Do not leave class early.**
- **Do not use your cell phone for calls or text messaging.** It *is* acceptable to use the cell phone for taking pictures and using the calculator related to class activities.
- **Bring your lab manual and science notebook to every class.**
- **Study 2-3 hours outside of class for every hour in class.** This class is a lot of work. Here are some suggestions for how to study:
 - Before every lab, read the lab manual. It is essential to come prepared for lab because we will begin immediately with the expectation that you have read the procedure.
 - Before every class, check the syllabus to see what we will be doing. If there is an assigned reading, skim the pages so you know what will be covered.
 - In class, speak up. Participate. Ask lots of questions. Enjoy yourself. Science is FUN!
 - After every lab, complete all parts of the assignment that you did not finish in class.
 - After every class, read the assigned material and make lots of notes in the margins of your textbook.
 - After every class, review everything you learned by rewriting any notes from class, combining them with reflections from the activity, and any assigned reading.
 - Before an exam, reorganize what you have learned in another way. Create flash cards to review vocabulary (especially for the body systems). Draw/copy pictures. Create a table. Go back over your science notebook with an eye towards editing and revising your work to make it better. Make sure that you know everything listed in the study guides (I ask very few questions that simply require regurgitating a definition. I am assessing for mastery and deep conceptual understanding.)!
- **Do not hesitate to ask questions.** Ask questions in class. Ask before or after class. E-mail me. Come to my office hours. No question is stupid. Philosophical discussions about biology, science, and teaching are welcome. My job is to help you but you have to ask for help first.
- **All University policies pertain to this course.** If you want or need to drop this class, you may do so for any reason during the first 2 weeks of the semester through the Portal and during the 3rd or 4th weeks by submitting a Change of Program (COP) form signed by me. After the 4th week, to drop a class, you must have a “serious and compelling reason” as defined by the University or your advisor. (Reasons NOT considered serious and compelling include low grades, failure to attend class, dissatisfaction with the course material or instructor, difficulty of the material, pressure of other classes or extracurricular activities, or lack of motivation.) The Department of Biological Sciences and the College of Natural Sciences interpret the “serious and compelling” rule strictly.

Grading:

190 points	2 Science notebook checks (10 points per lab) Science notebooks will be collected twice during the semester. Although there are 20 graded labs, only 19 are "required". That means that you can skip one lab this semester and still get the full amount of required lab points. If you attend and complete all 20 labs, then the extra lab is worth 10 points extra credit. Science notebooks will be graded on organization, completeness, level of detail, and neatness (see Science notebook grading rubric in the lab manual).
160 points	8 Presentations (20 points each) There will be 8 presentations throughout the course. Some are individual presentations while others are group presentations describing experimental results. Grading criteria are described in your lab manual.
200 points	2 Midterm exams (100 points each) These will be open-book, take-home exams covering recent material from both lecture and activities.
50 points	5 Pop quizzes (10 points each) These unannounced science content quizzes will model questions similar to those you might see on the midterms and/or final. There are no make-ups.
150 points	1 Final exam (150 points) The final exam is cumulative. Material from both lecture and activities will be addressed.
	Extra credit (10-50 points) A variety of extra credit possibilities will be announced during the course of the semester.
750 points total	

You accumulate points throughout the semester. These points will be converted to a grade at the end of the semester according to this scale:

Grade	Minimum points	Percentage
A	697.5	93%
A-	675	90%
B+	652.5	87%
B	622.5	83%
B-	600	80%
C+	577.5	77%
C	547.5	73%
C-	525	70%
D	450	60%
F	Below 450	Below 60%

August 19, 2009

Dear Students,

It is with great sadness that I will be canceling several class meetings with you this semester due to the mandatory faculty furloughs being required across the CSU system. These furlough days will unfortunately mean that I will be unable to include all elements of this class that I believe would provide the best educational experience. Unfortunately this is the result of a dramatic cut to the CSU by the state. I am very proud of the course that I originally designed and it has been very difficult to eliminate several hours of class meeting time.

The following changes have been made:

- Normally, lectures in this course include hands-on activities, classroom discussion, and group participation. Due to the furloughs, 3 lectures will be watched on-line, rather than in person. Questions about the lecture will be taken at the next class meeting or during office hours.
- Normally, we watch and discuss video clips of elementary school children learning the same concepts as we are learning in the class. These videos are designed to help you relate your own learning to the learning of children. Due to the furloughs, we will not have time to watch these video clips.
- Normally, KWLH assignments are intended to force you to write down what you think you know about topics in this class before I teach you anything, and then keep track of how and why your thinking changes over time. Basically it's a kind of learning "journal" that you compare to the learning you see taking place in young children through the video clips. To complete the KWLH assignment you must have watched the video clips. Therefore, due to the furloughs, KWLH assignments will not be required. This has the side effect of skewing the grading in this class more heavily towards exams and less on personal reflection.
- Normally, I offer a wide array of extra credit opportunities ranging from field trips to lectures to extra activities. Instead, the video clips will be made available online and watching the videos, reflecting on them, and reflecting on your own learning will be offered as extra credit opportunities.
- One major life science concept, the movement of small molecules across membranes (called *diffusion*, or in the special case of water, *osmosis*), will not be covered in lab (A12-Osmosis Eggs). Instead, the concepts will be introduced in a demonstration/lecture format only.

I hope that these modifications do not impact your experience in this class too greatly. I did my best to minimize any effects to the best of my ability.

Sincerely,