

Introduction to Biology Laboratory: Course Syllabus

Instructor: Alice M. Lee, Ph.D.

Lab/Office: Contemporary Science Center Labs at the Museum of Life & Science, Durham, NC

Lab meets every other Tuesday* 10:00am - Noon

Check CSC website for exact lab dates:

<http://www.contemporarysciencecenter.org/homeschoolbiolabs.html>

Instructor email: ewa125@hotmail.com

Welcome to Introductory Biology Laboratory! This year we will cover many exciting topics. This is an inquiry-based lab class where information will be presented using a variety of teaching methods including short lecture, demonstration, class discussion, hands-on laboratory work, and individual and/or group student presentations. The process of science is one of questioning; consequently, students are encouraged to ask questions and pursue the answers both inside and outside of class time.

Science labs and activities can be very exciting, and so everyone will want to participate. Safety is a top priority in a science classroom, and for this reason participation will be based on proper behavior (following directions, exercising caution and good judgment, etc.).

Text:

There is no required textbook, however I can recommend some textbooks (see below). You may use any available textbook on hand to find the answers to the prelab questions and any online resources (Properly cited!). Handouts will be available when necessary. Please contact me if you have any questions in this regard.

Recommended text:

Campbell, N.A. and J.B. Reece. *Biology*, 6th, 7th or 8th editions. Benjamin Cummings, San Francisco.

Course Outcomes:

As a result of this class students will know, understand and be able to do the following:

- improved their questioning skills by learning what constitutes a good scientific question
- learned to design some possible approaches to answering those questions (experimental design)

- improved their powers of observation, use of various lab instruments, understand the theory behind laboratory techniques and explore the latest biotechnological techniques.
- improved their critical thinking, especially in reference to claims which purport to be scientific
- gained an appreciation for the unity and diversity of life
- applied biological knowledge to the analysis of some current social questions

This is a survey lab course so students will gain an introductory understanding of the concepts and skills related to the basic chemistry of life, cell size and cell processes, genetics, microbiology, biotechnology, classification, basic enzyme kinetics and biochemistry, plant and animal anatomy, ecology and biodiversity.

Course Grading Policies:

Lab Reports: 85%

Prelab questions: 15%

Lab reports: Reports will be required after the completion of each lab activity and to be handed in the following week for grading. Each student will be required to keep a notebook for taking notes during labs and lab short lecture. These notes will aid in completing the lab reports. Most labs will be done with partners, but *each student must keep his or her own lab notes and turn in his or her own lab reports.*

Information on the organization of lab notes and lab reports will be given at the first lab session.

Prelab Questions: A short series of questions sent to the student to be completed prior to the next lab class. These questions will be on the upcoming lab and reading will be required prior to lab.

The following guidelines will be used to grade written assignments:

1. Complete sentences will be used in assignments unless otherwise directed. A one word or short phrase answer will not earn full credit on assignments needing complete sentences. Proper grammar, spelling and legibility is required.
2. Support for answers should be included in your response. Referring to the text is an example of how to support an answer.
3. Reports must be handed in on time, late assignments incur a 5 point deduction each day it is late.

Course Materials:

Materials/supplies: 3-ring binder with paper, writing utensil, coloring pens and pencils, calculator, ruler.

Attendance Policies:

Students must participate in laboratory activities and be on time for lab.

Contacting the Instructor:

I will be available after lab class for extra help. Please feel free to email or see me if you have any questions or concerns. My e-mail address is listed above.

Tentative General Course Syllabus:

Lab #	Dates	General Category	Lab
1	9/07/10	Introduction to Biology	Lab Safety, Scientific inquiry, Basic microscopy
2	9/21/10	Cells: Prokaryotes,	Culturing bacteria, simple and gram staining, cell wall structures
3	10/5/10	Cells: Eukaryotes	Plant and Animal cellular structures and function
4	10/19/10	Cellular organization	Limitations on cell size
5	11/02/10	Cellular transport	Rates of osmosis and diffusion
6	11/16/10	Cellular enzymatic reactions	Enzyme Activity (catalase, protease, amylase, invertase)
7	11/30/10	Cellular metabolism	Cellular respiration
8	12/07/10	Plant physiology	Photosynthesis in elodea or cabomba plants
9	12/14/10	Cell replication	Mitosis or meiosis lab
10	01/04/11	Anatomy structure and function	Animal dissection Internal anatomy
11	01/18/11	Anatomy structure and function	Insect dissection External anatomy
12	02/01/11	Plant Anatomy and physiology	Flower and seed dissection, chlorophyll chemistry
13	02/15/11	Animal Behavior	Pillbug response to environmental parameters
14	03/01/11	Genetics	Bacterial DNA extraction
15	03/15/11	Molecular biology	Restriction enzyme analysis
16	03/29/11	Molecular biology	Bacterial DNA transformation and genetics
17	04/12/11	Heredity and evolution	Human DNA analysis: DNA extraction and PCR
18	04/26/11	Heredity and evolution	Human DNA analysis: Gel electrophoresis
19	05/03/11	Nanobiotechnology	Synthesis of silver nanoparticles and antimicrobial effects
20	05/10/11	Open	Teacher's choice

