

Valdosta State University
Department of Biology, College of Arts and Sciences
BIOL 1107K: Principles of Biology I (4 credits)
Lecture and Lab (Sections A, B, C, S) Syllabus
Fall 2012

Instructor: Dr. Cy L. Mott

Office: Bailey Science Center 1212

Office Hours: Tuesday, Thursday 11:00 A.M. – 12:00 P.M.,
Tuesday 1:00 – 2:00 P.M., or by appointment

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Lecture (BSC 1023): Tuesday, Thursday 9:30 - 10:45 A.M.

Lab (BSC 1083): Section A: M 8:30 – 11:20 A.M.
 Section B: M 12:00 – 2:50 P.M.
 Section C: M 3:00 – 5:50 P.M.
 Section S: W 9:00 – 11:50 A.M.

Required Texts:

Sadava, A., D. M. Hillis, H. C. Heller, G. H., and M. R. Berenbaum. 2011. *Life: The Science of Biology*. 9th edition. Sinauer Associates, Inc. and W. H. Freeman & Co., Gordonsville, VA.

Goddard, R. H. 2010. *Methods and Investigations in Basic Biology*. 5th edition. Hayden-McNeil Publishing, Plymouth, Michigan.

Lab notebook: 3-ring binder with lined paper

Additional materials will be provided through the BlazeVIEW course page throughout the semester. Unless absolutely necessary, it is recommended that you do not print out documents provided online, but rather save them to a laptop, thumb drive, CD, etc. It will be less bulky for you to transport, less expensive, and less wasteful.

Prerequisites: None

Co-requisites: BIOL 1100, Biology Freshman Seminar

Course Description: (3-3-4) An introduction to the principles of biology for science majors, with an emphasis on the cellular nature of life. Concepts covered include the origin and early evolution of cellular life; cell structure, function, metabolism, and reproduction; cell signaling; and gene regulation in bacteria and eukaryotes.

General Course Goals: The primary goal of this course is to introduce you to the underlying principles of biology. Because this is an introductory course, no one topic will be studied in great detail. However, you should have sufficient background at the end of the quarter to pursue interesting topics in higher level courses. You should also gain the background necessary to understand the biology behind many of the problems and issues facing this country. It is also

hoped that you will gain an understanding of how biologists and other scientists approach problems.

The biology program also seeks to develop your general college skills so that you will be competitive when you apply for professional schools (e.g., medical school) or for jobs in the sciences. In this course we focus on your communication skills, your information processing skills, and your ability to think. Your communication skills will be exercised primarily through library assignments and written and/or oral reports of lab activities. Your information processing skills will be developed because of the nature of biology. You will be supplied with a large quantity of information in a very short time, which you must learn in some detail or you will not do well in this course. This will not be wasted effort, however. The ability to digest and incorporate large amounts of information quickly is a valuable skill in most fields of endeavor. Your ability to think will be involved in the analysis of lab exercises, class assignments, and test questions.

Specific Course Goals: By the end of this course, students will be able to answer questions that demonstrate an understanding of fundamental concepts of biology, including:

- 1) the scientific method and experimental design; cellular structure, function, metabolism, and reproduction; the nature of the gene and its action; and the mechanisms of evolution (GEO 5; BEO 1-4);
- 2) perform a variety of standard lab techniques used in biological research (GEO 5);
- 3) use critical thinking skills and written communication skills to analyze and evaluate the content quality of written and visual media relating biological knowledge (GEO 4 & 7);
- 4) present the results and conclusions of data collected in the lab in standard scientific writing format (GEO 4 & 7; BEO 1);
- 5) conduct a literature review at VSU's Odum Library (GEO 3)

Attendance: Attendance in lecture is expected of all students, and attendance in laboratory is mandatory. Excused absences for college-approved activities and in cases of personal emergencies (i.e., death in the immediate family or student hospitalization) will be approved at the discretion of the instructor if provided with suitable documentation. In the case of college-approved activities, students must provide a minimum of five (5) business days' notice to the instructor so that accommodations can be made. Lecture exams/quizzes and labs missed without prior approval cannot be made up, and all points associated with missed lectures/labs will be forfeited. Students missing more than three (3) laboratories during the semester will automatically receive an "F" for the course. **UNDER NO CIRCUMSTANCES CAN A LABORATORY BE "MADE UP"!** Students missing a lab with prior approval must attend one of the other lab sections for the week, and students missing lecture exams/quizzes with prior approval must take exams/quizzes before their scheduled absence. If students do not take exams and/or quizzes prior to approved absences, students may be required to take an alternate test and/or quiz. Students with potential course conflicts that restrict them from arriving or leaving class on time should consult with the instructor immediately.

Assessments:

LECTURE

Quizzes (50 points) - Six (6) pop quizzes will be administered throughout the semester to ensure that students are attending lecture and keeping up to date with the required readings. Quizzes will cover past information, and students will have 10 minutes during either the beginning or end of class to take the quiz. Students arriving late will not be given extra time to complete quizzes administered at the beginning of class, and they must sit apart from the rest of the class if possible. Each quiz will be worth ten (10) points, and the lowest quiz grade will be

dropped. No quizzes can be made up, and a missed quiz automatically counts as the dropped quiz (additional missed quizzes will count as grade of zero (0) towards your point total).

Exams (300 points): The dates for all exams are included in the Tentative Schedule (subject to change). **YOU MUST BRING A PENCIL WITH YOU.** All cell phones must be turned off during exams, and students using cell phones during an exam will automatically earn a zero (0) for that exam. All book bags, books, purses etc. must be placed on the stage at the start of the exam; **NO EXCEPTIONS.** If you do not feel comfortable putting your purse, bag, books, etc. on the stage, do not bring them with you to class. Hats, sunglasses, or other cryptic attire cannot be worn during exams. Students are not permitted to leave the classroom or lab during an exam, and any students doing so will earn a zero (0) for that exam.

Review sheets with topics on which the students will be tested will be handed out prior to the exam. These review sheets will contain a list of topics that the student is expected to understand; the review sheets do NOT contain the details that may appear on the exam. While the professor makes a reasonable effort to make these sheets all inclusive, it is entirely possible that a topic will be inadvertently left off that will show up on the exam.

There will be four exams (excluding the final) given throughout the semester. Each exam will consist of a variety of types of questions that will include matching, multiple choice, true/false, labeling, fill in the blank, **and** short answer. In recognizing that some students may be unfamiliar with the design and/or difficulty of college-level exams, the point structure of the four exams is tiered as follows:

Exam I = 25 points

Exam II = 50 points

Exam III = 100 points

Exam IV = 125 points

There will be NO make-up exams. Only students with a University-related excuse may take an exam early. Your best policy: **DO NOT MISS EXAMS!**

Final (200 points): The final will be cumulative and will have a format similar to the other exams. The date of the final is Thursday, December 6 (10:15 A.M.- 12:15 P.M.). **NO EARLY EXAMS WILL BE GIVEN!** Potential scheduling conflicts must be brought to the attention of the instructor as soon as possible.

LABORATORY

Quizzes (100 points): Throughout the semester, eleven (11) quizzes will be administered in lab, with each quiz testing your understanding of both the previous lab exercise and your basic understanding of the scope and methods of the current lab activity. Each quiz will be worth ten points, and the lowest quiz score will be dropped. Any missed quizzes will earn a grade of zero (0), and no quizzes may be made up.

Lab Notebook (50 points): Each student will be required to keep a lab notebook that details the introductory material, purpose, methods, results, and individual conclusions for each lab activity. Grading will be based on completion, detail, grammar, spelling, and other factors, and each student is expected to complete their own independent work.

Lab Reports/Homework (100 points): During the semester, students will be required to complete one formal lab report in the style of a journal article (50 points; more detail will be provided on this assignment as the course progresses). In addition, homework problems amounting to fifty (50) total points will be assigned for some lab activities, and they will generally be due the following week in lab.

Total Points (Lecture + Lab):

Lecture Quizzes:	50 points
Lecture Exams:	300 points
Final Exam:	200 points
Laboratory Quizzes:	100 points
Laboratory Notebook:	50 points
Laboratory Report/Homework:	100 points
Total	800 points

Your current grade in the course can be calculated at any time by dividing the number points earned from the total points possible for assignments, exams, etc. completed to date.

THERE IS NO EXTRA CREDIT FOR THIS COURSE!!!**Grade Scale:**

For Biology majors, a grade of C or higher is required for this course.

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F = < 60%

Withdrawing from the course: The last day to withdraw without penalty is Thursday, October 4, 2012. If you don't officially withdraw, and instead just stop coming to class, you will receive an F for the course.

Academic conduct: Cheating and plagiarism will not be tolerated and may result in a failing grade for the assignment, exam or the class. The Department of Biology has a plagiarism policy, which will be referenced during the first lab period. Students will be expected to provide a signed copy of the Plagiarism Policy, which acknowledges that they have read and understood the content, by the following lab period.

Privacy Act (FERPA): The Family Educational Rights and Privacy Act (FERPA) prohibits the public posting of grades by social security number or in any manner personally identifiable to the individual student. No grades can be given over the telephone or email because positive identification can't be made.

Students with disabilities: Students requiring special accommodations because of disability should discuss their needs with me as soon as possible. Those needing accommodations that are not registered with the Special Services Program must contact the Access Office for Students with Disabilities located in Farber Hall. The phone numbers are 245-2498 (voice) and 219-1348 (tty).

Student Conduct:

- 1) **No food or drink in lab**; such items are permitted in lecture as long as waste is not left in the classroom (this includes spills) and recyclables are not deposited in the garbage bin (this rule will likely be broken in the first week!)
- 2) Children, friends, or pets are not allowed in lecture or lab
- 3) **No active cell phones or other electronic/multimedia devices in lecture or lab** without instructor approval. This rule is in effect at the time class starts, and all electronic devices, if present, should be placed in bags or otherwise out of site. Following the first week of class, 2% will be deducted from your final grade for each offense. If cell-phone usage persists, disruptive students may be asked to leave, or

the instructor may ultimately leave the classroom (students will still be responsible for material that would have been taught during that time).

- 4) Assignments are due at the beginning of class/lab; assignments submitted after this time are late, and late submissions will incur a 50% grade reduction. After 48 hours have elapsed since the initial due date/time, no late assignments will be accepted.
- 5) Students that wish to bring laptop computers to class will be required to sit near the back or sides so as to eliminate distractions to classmates; if students are using such equipment in a distracting manner (i.e. checking email, web-surfing, listening to music, etc.) laptops will be banned from the classroom for all students.
- 6) You will only attend your predetermined laboratory section; in the case of missed labs, you cannot simply attend another lab section without prior approval from the instructor.
- 7) Cheating of any kind will not be tolerated; this includes copying another student's material, cheat sheets, electronic devices, etc. There will be no first warning, and I will recommend the maximum penalty for the first violation, up to and including **expulsion from the university**. As students, you are also responsible for policing each other. Consequently, anyone aiding a "cheater" or not reporting observed cases of cheating to the instructor will be considered an accomplice and subject to similar penalties as those actually cheating.

I maintain office hours for students needing to discuss course material, and these hours will always be available unless students are otherwise notified in advance. Office hours are meant to address specific questions students may have, not to re-teach lecture material in the case of student absence. If students cannot attend these scheduled office hours, they may make an appointment for an alternate time. However, if a student schedules an appointment outside of scheduled office hours and does not arrive, that student will lose the opportunity to schedule appointments outside of established office hours in the future.

NEVER, EVER, EVER, EVER EMAIL ME TO ASK WHAT YOU MISSED IN LECTURE/LAB IF YOU ARE ABSENT; IT IS YOUR JOB TO CONSULT WITH CLASSMATES AND DETERMINE WHAT YOU MISSED!!!

Notes/Study Tips:

- a) Remember when sending an email that your professor's name is not "Hey"; an email should begin with Dear XXXX, then continue with your message written in actual English words (not text language), and conclude with terms such as "Sincerely", "Thanks in advance", etc. Realize that many older people (i.e. your professors) are not biologically linked to their phones in the ways observed in younger generations...please allow up to three (3) business days before sending a follow-up email if you haven't received response.
- b) There is a documented positive relationship between how often you attend class and your grade...why pay thousands of dollars a semester to not take advantage of someone being paid to educate you?
- c) Educators recommend studying 2-3 hours per week for each credit hour, which means you should be studying 8-12 a week for this class, not counting the time spent in class. Without fail, the number one thing students say when describing why they did not achieve the academic goal they had set for themselves: "I should have studied more!"

- d) Don't simply write down the things that the instructor writes down; believe it or not, they may be saying something important even when they don't write it down! If you are not sure if it's important, write it down anyways, just to be sure. If your instructor talks too fast, ask (don't tell) him/her to slow down...this is your very expensive education, so get what you need out of it.
- e) The phrase "***I don't know***" is the most powerful phrase in the sciences, because it allows us to push past the boundaries of current knowledge. Students are often embarrassed to admit they don't know something, but not knowing is what has allowed the world's greatest scientists to uncover new things. Odds are, if you don't know, half of the class does not know either...
- f) When students say they can multi-task while studying, what they really mean is that they enjoy doing twice as much work for half of the result. If you eliminate distractions (TV, music, crowds, etc.) your increased focus will allow you to absorb the information much faster and more completely, allowing you time for more enjoyable activities (unless studying is your most enjoyable activity).
- g) **BIOLOGY IS HARD!** Few students ever list something in the sciences as an "easy major", so the earlier you realize the difficulty of the field, the less likely you will be to panic, become unorganized, or, most often, blame the instructor for being "too tough".
- h) The phrase "*D for Degree*" no longer applies, as approximately 120,000 students a year are graduating with a biology degree, to such extent that just having the degree is no longer the easy way into getting a job. Due to the overabundance of degree-holders, those with lower GPAs will only have those jobs available to them that better students did not want (ask me about not salting your food during an interview)...
- i) Most students view higher education as the way to get a job...but you have a job right now as a student, and you should get into the habit of practicing good workplace ethics now: be on time, be prepared, and take responsibility for yourself (because no one else will!)

VALDOSTA STATE UNIVERSITY GENERAL EDUCATIONAL OUTCOMES (GEO)

1. Students will demonstrate understanding of the society of the United States and its ideals. They will possess the requisite knowledge of the society of the United States, its ideals, and its functions to enable them to become informed and responsible citizens. They will understand the connections between the individual and society and the roles of social institutions. They will understand the structure and operational principles of the United States government and economic system. They will understand United States history and both the historical and present role of the United States in the world.
2. Students will demonstrate cross-cultural perspectives and knowledge of other societies. They will possess sufficient knowledge of various aspects of another culture, including the language, social and religious customs, aesthetic expression, geography, and intellectual and political history, to enable them to interact with individuals within that society from an informed perspective. They will possess an international viewpoint that will allow them to examine critically the culture of their own nation and to participate in global society.
3. Students will use computer and information technology when appropriate. They will demonstrate knowledge of computer concepts and terminology. They will possess basic working knowledge of a computer operating system. They will be able to use at least two software tools, such as word processors, spreadsheets, database management systems, or statistical packages. They will be able to find information using computer searching tools.

4. Students will express themselves clearly, logically and precisely in writing and in speaking, and they will demonstrate competence in reading and listening. They will display the ability to write coherently in standard English; to speak well; to read, to understand, and to interpret the content of written materials in various disciplines; and to listen effectively and to understand different modes of communication.
5. Students will demonstrate knowledge of scientific and mathematical principles and proficiency in laboratory practices. They will understand the basic concepts and principles underlying scientific methodology and be able to collect, analyze, and interpret data. They will learn a body of scientific knowledge and be able to judge the merits of arguments about scientific issues. They will be able to perform basic algebraic manipulations and to use fundamental algebraic concepts to solve word problems and equations. They will be able to use basic knowledge of statistics to interpret and to analyze data. They will be able to evaluate arguments based on quantitative data.
6. Students will demonstrate knowledge of diverse cultural heritages in the arts, the humanities, and the social sciences. They will develop understanding of the relationships among the visual and performing arts, literature and languages, and history and the social sciences. Students will be versed in approaches appropriate to the study of those disciplines; they will identify and respond to a variety of aesthetic experiences and engage in critical thinking about diverse issues. They will be able to identify the components of and respond to aesthetic experiences in the visual and performing arts. They will develop knowledge of world literature within its historical and cultural frameworks. They will understand modern issues within a historical context and the role of the individual in various forms of societies and governments.
7. Students will demonstrate the ability to analyze, to evaluate, and to make inferences from oral, written and visual materials. They will be skilled in inquiry, logical reasoning, and critical analysis. They will be able to acquire and evaluate relevant information, analyze arguments, synthesize facts and information, and offer logical arguments leading to creative solutions to problems.
8. Students will demonstrate knowledge of principles of ethics and their employment in the analysis and resolution of moral problems. They will recognize and understand issues in applied ethics. They will understand their own value systems in relation to other value systems. They will judge values and practices in a variety of disciplines.

DEPARTMENT OF BIOLOGY EDUCATIONAL OUTCOMES (BEO)

1. Develop and test hypotheses, collect and analyze data, and present the results and conclusions in both written and oral format used in peer-reviewed journals and at scientific meetings.
2. Describe the evolutionary process responsible for biological diversity, explain the phylogenetic relationships among the other taxa of life, and provide illustrative examples.
3. Demonstrate an understanding of the cellular basis of life.
4. Relate the structure and function of DNA/RNA to the development of form and function of the organism and to heredity
5. Interpret ecological data pertaining to the behavior of the individual organism in its natural environment; to the structure and function of populations, communities, and ecosystems; and to human impacts on these systems and the environment.

Tentative Lecture Schedule

Date	Topic	Chp.
14-Aug	Introduction; What is Science? What is Biology?	1
16-Aug	Chemistry of Life	2
21-Aug	Chemistry of Life, con't.	
23-Aug	Proteins, etc.	3
28-Aug	Proteins, etc. con't	
30-Aug	Nucleic Acids	4
4-Sep	EXAM I	
6-Sep	Cells	5
11-Sep	Cells con't.	
13-Sep	Cell membranes	6
18-Sep	Cell signaling	7
20-Sep	Energy	8
25-Sep	Energy con't.	
27-Sep	EXAM II	
2-Oct	Harvesting chemical energy	9
4-Oct	Midterm; Harvesting chemical energy con't.	
9-Oct	Photosynthesis	10
11-Oct	Photosynthesis con't.	
16-Oct	<i>FALL BREAK (NO CLASS)</i>	
18-Oct	Cell Cycle	11
23-Oct	Cell Cycle con't.	
25-Oct	Inheritance	12
30-Oct	EXAM III	
1-Nov	DNA	13
6-Nov	DNA con't.	
8-Nov	DNA Expression	14
13-Nov	DNA Expression con't.	
15-Nov	Mutations	15
20-Nov	Gene Regulation	16
22-Nov	<i>THANKSGIVING BREAK (NO CLASS)</i>	
27-Nov	EXAM IV	
29-Nov	Final Review	
4-Dec	<i>EXAM PREP DAY (NO CLASS)</i>	
6-Dec	FINAL EXAM (10:15 A.M. - 12:15 P.M.)	

Tentative Laboratory Schedule

Week of	Topic:
13-Aug	Laboratory Introduction
	Ex. 1 Introduction to the Use of the Scientific Method
20-Aug	Ex. 2 Basics of the Light Microscope.
27-Aug	Ex. 3 Light Microscopy + Ex. 4: Independent Projects
3-Sep	Labor Day – No Lab
10-Sep	Ex. 4 Independent Group Microscopy Project: Data collection lab
17-Sep	Ex. 5 Cellular Water Relations
24-Sep	Ex. 6 Protein extraction & quantification
1-Oct	Ex. 7 Enzymology: α -amylase activity
8-Oct	Ex. 8 Enzymology: effects of temperature on enzyme activity
15-Oct	Fall Break – No Lab
22-Oct	Ex. 9 Photosynthesis
29-Oct	Ex. 10 Cell reproduction: Mitosis, Meiosis, & Cytokinesis
5-Nov	DNA fingerprinting & Ex. 12 PCR-Based VNTR Human DNA Typing
12-Nov	Ex. 13 Genetically Modified Organisms part 1
19-Nov	Thanksgiving Holiday – No Lab
26-Nov	Ex. 13 GMO part 2