

Valdosta State University
Department of Biology, College of Arts and Sciences
BIOL 1107K: Principles of Biology I (4 credits)
Lecture and Lab (Sections B, E) Syllabus
Spring 2015

Instructor: Dr. Cy L. Mott

Office: Bailey Science Center 1212

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

Phone: 229-333-7851

E-mail: clmott@valdosta.edu

Lecture (BSC 1021): Tuesday, Thursday 9:30 - 10:45 A. M.

Lab (BSC 1083): Section B: Tuesday 2:00 – 4:50 P. M.
 Section E: Thursday 12:30 – 3:20 P. M.

Required Texts:

Sadava, A., D. M. Hillis, H. C. Heller, G. H., and M. R. Berenbaum. 2014. Life: The Science of Biology. 10th edition. Sinauer Associates, Inc. and W. H. Freeman & Co., Gordonsville, VA.

Goddard, R. H. 2013. Methods and Investigations in Basic Biology. 6th 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 and lab is expected of all students and will be verified in lecture using clicker responses and in lab through weekly quizzes administered in the first fifteen minutes of lab; students responding to < 80% of lecture clicker questions throughout the semester or attending less than 15% of lab will automatically receive an "F" for the course due to non-attendance (updated records of your attendance **will not** be provided frequently throughout the semester, therefore students who miss class often must be responsible for keeping track of their own attendance habits). If you do not have a clicker for a particular day in class, you will be recorded as "absent". Students arriving > 15 minutes late to lab will not be permitted to participate in lab activities and will be recorded as "absent". **UNDER NO CIRCUMSTANCES MAY A LAB BE "MADE UP" AFTER THE WEEK OF THAT LAB HAS PASSED!!!** The VSU policy of 80% minimum attendance will be strictly enforced, and the 20% allowable absences include any and all classes missed due to: a) illnesses; b) athletic activities; c) "family emergencies", and any other events. Therefore, if you miss 20% of clicker questions due to unexcused absences (i.e. overslept, car trouble, extended your spring break, etc.) and then have an excused absence, you have exceeded the 20% limit and will fail the class due to non-attendance. No absences will be deemed "excused" simply because they place a student over the 20% mark, and therefore students must be responsible enough to monitor their absences. No sharing of clickers is permitted, and any students caught "clicking in" for another student will immediately fail the course, as will the student whose clicker is being used... therefore, guard your clicker with your life!

Absences for college-approved activities and in cases of personal emergencies (i.e., death in the immediate family or student hospitalization) on exam/quiz days will be approved at the discretion of the instructor if provided with suitable documentation (which may include doctors' notes, hospital admittance forms, or obituaries). In the case of college-approved activities, students must provide a minimum notice of five (5) business days to the instructor so that accommodations can be made. Lecture exams missed without prior approval cannot be made up, and all points associated with missed lectures will be forfeited. Students missing lecture exams with prior approval must take exams before their scheduled absence; no student will be

permitted to take a lecture exam after it has been administered to the rest of the class. Students missing lab with prior approval due to college-approved activities and/or personal emergencies as described above may have the opportunity to attend another lab section during the week if available, but this will depend on seating availability and timing (i.e. if you are absent for a Thursday lab and contact me on Wednesday, there is no possibility to attend my other lab section because it is on Tuesday and thus it will already be too late). Students with potential course conflicts that restrict them from arriving or leaving class on time should consult with the instructor immediately.

Assessments:

LECTURE

Exams (400 points): The dates for all exams are included in the Tentative Schedule (i.e. 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 at the front or back of the room at the start of the exam; **NO EXCEPTIONS.** If you do not feel comfortable putting your purse, bag, books, etc. away from you, do not bring them with you to class. Hats, sunglasses, or other cryptic attire cannot be worn during exams, and no headphones or other electronic devices are permitted. Students are not permitted to leave the classroom 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 appear on the exam.

There will be five exams (excluding the final) given throughout the semester. Each exam will consist of a variety of types of questions that could include matching, multiple choice, true/false, labeling, fill in the blank, **and** short answer. In addition, each exam will be “semi-cumulative” in that it will include select information from all previous chapters of which students will be informed. 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	= 45 points
Exam II	= 55 points
Exam III	= 75 points
Exam IV	= 100 points
Exam V	= 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 (Optional): The final will be cumulative with a format similar to the other exams. If you are satisfied with your grade after Exam V and all lab grades have been posted, you may keep that grade and not take the final. If you opt to take the final, the final grade will replace either: a) your lowest exam score; or b) the exam score for which replacement will result in the most points added if it is not the lowest exam score (i.e. if an earlier exam is the lowest score, but replacing a later exam will result in more points because they are worth more). However, the final will replace another exam even if the final is your worst score of the semester, so make sure that your score on the final will exceed that of all the lecture exams. The date of the final is Thursday, May 7th (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 (My lab sections)

Quizzes (50 points): Throughout the semester, eleven (11) quizzes will be administered, with each quiz testing your understanding of the previous lab exercise and the scope and methods of the lab activity conducted that day. Each quiz will be worth five 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. No students are permitted to leave the room during a quiz (which will result in a grade of zero (0)), and students arriving late to lab will not receive extra time.

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 Report (50 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).

Total Points (Lecture + Lab):

Lecture Exams:	400 points
Final Exam:	Replaces a lecture exam
Laboratory Quizzes:	50 points
Laboratory Notebook:	50 points
<u>Laboratory Report/Homework:</u>	<u>50 points</u>
Total	550 points

Your current grade in the course can be calculated at any time by dividing the number points you have 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%

For students taking lab with other professors, your lab will be worth 25% of your final grade. To calculate your final grade, use the following formula:

$$(\text{Lab percentage grade} \times 0.25) + (\text{Lecture percentage grade} \times 0.75) = \text{Course Grade}$$

Withdrawing from the course: The last day to withdraw without penalty is Thursday, March 5th, 2015. 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 a positive identification cannot 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, students observed using cell phones will be asked to leave, and repeat offenders will be dropped from the class.
- 4) Assignments are due at the beginning of class/lab, and no late assignments will be accepted for any reason.
- 5) Students that wish to bring laptop computers/tablets to class will be required to sit in the first 3-4 rows of the lecture hall; if students are using such equipment in a distracting manner (i.e. checking email, web-surfing, listening to music, etc.) they will be asked to leave, and repeat offenders will be dropped from the class.
- 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 professor.
- 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 a 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	Chapter
13-Jan	Introduction; What is Science? What is Biology?	1
15-Jan	Chemistry of Life	2
20-Jan		
22-Jan	Biological Molecules	3
27-Jan		
29-Jan	Nucleic Acids	4
3-Feb	EXAM I	
5-Feb	Cell Structure and Function	5
10-Feb		
12-Feb	Cell Membranes and Cell Signaling	6 + 7
17-Feb		
19-Feb	EXAM II	
24-Feb	Enzymes, Energy, and Metabolism	8
26-Feb		
3-Mar	Harvesting chemical energy	9
5-Mar		
10-Mar	Photosynthesis	10
12-Mar		
17-Mar	EXAM III	
19-Mar	Cell Cycle	11
24-Mar	SPRING BREAK - NO CLASS	
26-Mar	SPRING BREAK - NO CLASS	
31-Mar	Cell Cycle cont'd.	
2-Apr	Inheritance	12
7-Apr	EXAM IV	
9-Apr	DNA and Heredity	13
14-Apr		
16-Apr	DNA Expression	14
21-Apr		
23-Apr	Mutation	15
28-Apr	Gene Regulation	16
30-Apr	EXAM V	
5-May	EXAM PREP DAY (NO CLASS)	
7-May	FINAL EXAM (10:15 A.M. - 12:15 P.M.)	

Tentative Laboratory Schedule

Week of:	Topic
14-Jan	Introduction to Lab and the Lab Notebook
21-Jan	MLK No lab
28-Jan	Ex. 1 Introduction to the Use of the Scientific Method
4-Feb	Ex. 2 Basics of the Light Microscope.
11-Feb	Ex. 3 Light Microscopy + Ex. 4: Independent Projects
18-Feb	Ex. 4 Independent Group Microscopy Project: Data collection lab
25-Feb	Ex. 5 Cellular Water Relations
4-Mar	Ex. 6 Protein extraction & quantification
11-Mar	Ex. 7 Enzymology: α -amylase activity
18-Mar	Ex. 8 Enzymology: effects of temperature on enzyme activity
25-Mar	SPRING BREAK - NO LAB
1-Apr	Ex. 9 Photosynthesis
8-Apr	Ex. 10 Cell reproduction: Mitosis, Meiosis, & Cytokinesis
15-Apr	DNA fingerprinting: Crime Scene Investigation
22-Apr	Ex. 14 Transformation of the pGLO plasmid into bacteria PART 1
29-Apr	Ex. 14 Transformation of the pGLO plasmid into bacteria PART 2