

BIO121 – General Biology II

Since scientists first started cataloguing Earth's living organisms, over 1.5 million organisms have been identified¹. These include familiar organisms such as elephants, bears, and palm trees. But they also include the obscure, such as the South American Pygmy marsupial frog, which develops eggs in an open pouch on the back of the female. How many species are there? How did they come into existence? Scientists agree that the Earth's diversity is a result of evolutionary processes. Furthermore, scientists believe that understanding evolutionary processes are essential for understanding biological concepts. As your book states "Evolution...is the one biological theme that ties together all others."² Theodosius Dobzhansky went so far as to say "Nothing in Biology Makes Sense Except in the Light of Evolution."³ The diversity of life, which has taken billions of years to develop, is being lost at an alarming rate primarily as a result of human impacts. Extinction rates for species have increased many times that of the normal rate. What is the future of the world's biodiversity? It all depends on the importance our society places on maintaining biodiversity. During the course of this semester, we will explore the unity and diversity of life including the mechanisms involved with its origination and the current threats to its persistence.

If there are any students in the class who have special needs because of learning or physical disabilities, please contact the Office of Academic Support (OAS) at 331-2490.

This course is intended to prepare biology majors for future biology classes. If you are not a biology major (or a science major) and do not have an interest in being challenged to think about biological concepts in depth, please consider transferring to a course intended for non-majors. There are several courses such that are designed primarily for those students not interested in pursuing a career in biology. If you remain in the class, I will assume that you are willing to put the effort into learning and welcome the challenges and fun that you will soon be facing.

Textbook:

Campbell, N.A. and J.B. Reece. 1999. *Biology 6th Edition*. Benjamin Cummings. Menlo Park, California. 1175 pp.

Science is more than just a body of knowledge; it is a way of knowing. Much of the information we will be exploring over the semester has been determined through extensive scientific research. Through data collection and interpretation of results, scientists have gained a better understanding of how the diversity and unity of life could have originated. As future biologists, it is important that you gain an understanding of how to interpret data and answer questions. Over the course of the semester, you will have the opportunity to examine data to try and answer some key questions in biology. Furthermore, there will be some outside readings of original research as well as popular media, so you can gain an understanding of how much biological knowledge has been discovered.

Much of the material that we will cover is identified and elaborated in this text. This text provides an excellent overview and compilation of many of the major themes in biology. You will be relieved to know that we WLL NOT be covering all of the topics within the 1175 pages of this text. There is a plethora of biological concepts we could study, but this course is designed to cover only a few

¹ Wilson, E.O. 1999. *The Diversity of Life*. W.W. Norton & Company. New York.

² Campbell, N.A., J.B. Reece, and L.G. Mitchell. 1999. *Biology 5th Edition*. Benjamin Cummings. Menlo Park, California. 1175 pp.

³ Dobzhansky, T. 1973. Nothing in Biology Makes Sense Except in the Light of Evolution. *American Biology Teacher*. 35:125-129.

relating to the diversity of life. A tentative outline of topics and chapters covered are given in a table at the end of this document. It is impossible for me to cover, in detail, all of the chapters we need to cover in the time allotted during the semester. However, that does not mean that the material contained within a chapter that I do not cover is not important. On the contrary, you will still be responsible for showing an understanding of that material as well. Therefore, the text is required, and you will need to read the assigned chapters and have a clear understanding of the concepts that are covered. YOU MUST BRING YOUR TEXT TO CLASS EVERY DAY. At times, we will be using your text to search out answers to particular questions. Although the material covered in class will relate to the reading, I will not be covering the material verbatim from the text. My job is to provide you with a framework to assist you in your understanding of biology and help you become active in your learning of the material. Although I can provide help, I cannot learn the material for you. Therefore, you should work to integrate the material you are reading in your text with the information we are exploring in class. Both areas will be potential test material so don't neglect either the material in class or the concepts in the readings.

Grading:

It is important to note, that the reason you are in this course is to gain “the skills and general knowledge needed...to intelligently participate in public discourse.”⁴ I assume that you all will proceed on to other, more in-depth biology courses. This course will provide a foundation of knowledge from which to draw. With that in mind, your primary goal should be gaining knowledge and using it to think critically. To determine if you have been successful in mastering these skills and gaining the appropriate knowledge, we must evaluate your understanding of the material covered in this course. Evaluation of your biological knowledge will be done through five methods: (1) Online Tests, (2) Participation, (3) Cumulative Midterm and Final Exams, (4) Laboratory.

Online Tests:

I have found in the past that part of a student's success with an exam is how well they can take a test. Therefore, I provide an opportunity for you to practice taking tests in a less stressful situation using online tests. Over the course of the semester, there will be online chapter tests available through BlackBoard. Therefore, you need to make sure that you have access to the Internet. These practice tests will become available at different times during the semester and continue to be available until the time of the final cumulative exam. Once they are available, you may take them at any time (up until the time of the final exam) and can take them as often as you would like. Three caveats to consider:

- 1) I can only use the last score that you received on the test as your grade. The tests will be graded by BlackBoard and unfortunately the software does not keep track of how many times you took the tests nor can it tell me what your high score is. Each time you take a test, your previous score will be erased. Considering that you should go back and look at the material each time you are preparing to take the test, you should continually improve your grade. Which leads to the second caveat.
- 2) There is a bank of test questions for each online test. Questions are chosen for each test at random so no two tests are going to be exactly alike. This is done because the online tests are to allow you to practice taking tests and let you use the tests to evaluate your current knowledge. For instance, if you take each test as it becomes available to see what you know, and then as you learn more you take it again, you should see an improvement in the score. This will tell you that you are learning more information as you go.
- 3) You will not receive any feedback about which questions you missed because these online tests are to help you and I evaluate your level of understanding of a particular section. Furthermore,

⁴ Grand Valley State University Undergraduate and Graduate Catalogue. 2000-2001.

each exam could potentially have different questions as they are drawn from a pool of questions. So no two tests will necessarily be exactly alike. Each time you take an exam, think about each question and highlight the material related to the question to study later. That way you can learn the material and not the answers to the questions. Past students found this especially frustrating, because they wanted to know which ones they missed so they could only study for those questions. This really defeats the purpose of having the online quizzes because they are intended to help you EVALUATE what you know and not help you LEARN the material. Learning should happen outside of the test. However, if you consistently struggle to improve your score, I would suggest using your book to answer those questions that you really are struggling with.

Participation:

In order to truly learn this material, you need to be actively involved in thinking about it. Over the course of the semester, I will be giving you a number of tasks to help you better think about the concepts we are discussing. These assignments are intended to help you learn the material and give you a variety of opportunities to explore the material in different ways. Without participation, I can confidently say that you will not learn the material as effectively as you could have if you had actively participated. To encourage your engagement with the material inside and outside of the classroom, I will be giving a number of assignments that will be handed in to help me evaluate your participation. I will also be posting a few discussion questions each week. You will be required to reply to at least one of them each week as a way to engage more deeply with the concepts we are covering in class. You can look at all of these activities as busy-work and just do them in a cursory manner, or you can see them as opportunities for learning and spend the time really trying to complete them fully.

Exams:

Fifty-Five percent (55%) of your final grade will be determined by 2 cumulative exams. Both exams may include any combination of multiple choice, matching, true/false, and essay questions. The purpose of these exams is to evaluate what you have learned (after all that is what you are here for). It is important that you try to learn the material for more than just the exam.

Cumulative Midterm Exam:

On February 24th and 26th, there will be a cumulative midterm exam. This exam will cover all of the material that we addressed up to that point. This exam is worth 250 points (and will count as 25% of your total grade). This may seem overwhelming at first. However, if you are preparing in such a way as to integrate all of the material into a cohesive understanding each class period, you will find it easier. Furthermore, if you use the online tests consistently to help evaluate your understanding, you will be better off. **YOU CANNOT WAIT UNTIL THE WEEKEND BEFORE THE MIDTERM TO START PREPARING.** This is the easiest way to fail the exam. Start preparing the first week of classes. The exam will be taken over two class periods. Each day the exam will end promptly at 5:15 pm. On the second day, you will complete the exam at 5:15 pm.

Final Exam:

The final exam is cumulative and worth 300 points (30% of final points). The material will include both the material from the first part of the semester but also material from the second part of the semester. Therefore, you cannot just forget what was covered at the midterm. Again, start preparing now to retain a lot of these ideas in long-term memory storage. The final will be on Thursday April 22 from 4:00- 5:50 pm.

Laboratory:

Your total grade will also include your laboratory score. Therefore, you **must** be concurrently enrolled in a laboratory section of General Biology II. The maximum laboratory score you can receive is 250 points. This equates to 25% of your overall grade for this course.

Table 1. Summary of Grading **Note: The number of points is tentative, however, the percentage that each evaluation method contributes to your overall grade will remain the same.**

Evaluation Method	Total Points	% of Grade
Online Tests (5 @ 30 pts each)	150	15%
Participation	50	5%
Comprehensive Midterm Exam	250	25%
Comprehensive Final Exam	300	30%
Laboratory	250	25%
Total Points	1000	100%

IMPORTANT: You must obtain at least 60% of the total lab points to pass this course.

Grade	Percentage	# of Points
A	93-100%	930-1000
A -	90-92%	900-920
B+	87-89%	870-890
B	83-86%	830-860
B-	80-82%	800-820
C+	77-79%	770-790
C	73-76%	730-760
C-	70-72%	700-720
D+	63-69%	630-690
D	60-62%	600-620
F	59% or less	590 or less

NOTE: Along with obtaining at least 60% of the total lab points to pass this course, you must also have at least 600 points to pass this course. That equates to 60% of the total points available. The grading scales for this course will be:

Grade of Incomplete

In case illness, necessary absences, or other reasons beyond your control prevent you from the completion of course requirements before the end of the semester, an incomplete can be assigned. **This grade cannot be given as a substitute for a failing grade or withdrawal.** In this situation, documentation must be provided supporting that you are eligible for an incomplete.

Absences:

Absences will not be tolerated. You are paying for this class, so you might as well attend and gain the benefits of seeing, discussing, and actively participating in developing your knowledge. I will not accept homework if you are absent. If you miss an exam, you must contact me (331-3456 and leave a message) on the day that you are absent to explain your absence. You may also leave a message with the Academic Department Coordinator, Connie Ingham (331-2470) on the day that you are absent. **The only way that you can make up a missed exam is by providing documentation that the absence was unavoidable.**

BlackBoard:

I will be using BlackBoard to post grades, announcements, and discussion questions. Each week, I will post

Miscellaneous:

From time to time, I may need to contact you and your classmates. The best way I know of (short of calling each of you individually) is to use email. Therefore, you must have some type of email address. All students have access to email accounts through GVSU. Furthermore, I will be using the email function in BlackBoard. Please make sure the email address you are associated with in BlackBoard is correct. You can contact Academic Computing Service at ext. 12038 for help. Furthermore, some assignments may require you to use the Internet to access information. Therefore, you should become familiar with the Internet; especially many of the search engines that are available. You will also need to figure out where to get access to both the Internet and email. There are several computer labs on campus that have access. I will also use Blackboard (<http://bb.gvsu.edu>) for a number of purposes. Therefore it is essential that you become familiar with using it. There are a number of workshops offered by Instructional Technology that will help you learn to use this software. You can get information at ext. 13290 or 13794 or you can find them on the web at <http://www.gvsu.edu/it/students/index.htm>.

FAQs (Frequently Asked Questions)

Question: How can I succeed in this class?

Answer: The number one way to succeed in this class is attitude. Dedicate yourself to learning, not for the sake of exams, but for your own sake. You are here to improve yourself, expand your mind, and learn to think critically about the world around you. If your attitude is that you want to gain as much knowledge as you can, you have made the first step toward success. Beyond attitude, I would suggest that you come prepared to be an active participant in class. This means more than just making humorous remarks; really engage the topic we are discussing. You will find that I ask a lot of questions, expecting you to answer them. The more you answer questions and ask some of your own, the more you will be involved in learning. Another way to be successful is to continually evaluate what you have learned or are supposed to have learned. If something is not clear to you when we cover it in class, don't expect it to become clearer before the exam. Write down things you weren't sure about. Ask me or other students for help in understanding it better. I encourage you to find one or two other students in the class and form a study group. What you will find is that two or three brains are better than one. Those are just a few suggestions that I have found worked for me while I was taking courses, or have seen successful students doing. I also have other suggestions, but maybe you ought to come by my office sometime and we can talk about your specific situation.

Question: This textbook is really heavy. Do I need to bring it to class everyday?

Answer: YES!!! There are going to be a number of times that we will be working as groups to answer questions and having your book around will be quite handy. If your like me, carrying the textbook to class may be the only exercise you are getting, so you might not want to complain too much if it helps you get healthy.

Question: Should I read the assigned sections of the text before or after the day we cover that section in class?

Answer: I would strongly encourage you to read it before class. That way you have some understanding of the material we will cover. This will allow you to engage more actively with discussions during class.

I was looking at my grade, and right now I only have an A-. I would really like to get an A, can I do some extra credit?

Answer: I'm glad you are doing so well. Unfortunately, I don't believe that extra credit given to an individual to improve his or her grade is fair treatment for everyone. Therefore, I don't offer extra credit often. I do offer opportunities for extra credit, it will be for all students and at various times throughout the semester. The most extra credit you can receive is no more than 2% (20 points) of the overall grade and at best will only be able to raise your grade to the next level higher (for example from B+ to A- or from A- to A).

Question: Do you grade on the curve?

Answer: I don't think a lot of students understand what is really meant by the phrase "grade on a curve". What it used to mean is that a professor used a bell curve as his standard for assigning grades. The idea was that the grades of most students would be about average (or C); a small group would have higher and lower grades. So if I truly graded on the curve, most of my students would get C's, a fewer number would get B's and D's, and even fewer would get A's and F's. These days, when students ask about grading on the curve, what they want to know is if I lower the high score on a test (or final number of points). In other words, if the highest score on a test is a 92, will this score as 100% instead of the 100 points that were available. The only way that the number of points available on the test will be lowered is if I choose to throw out questions. After each exam, I look at each question and how students did on that question. If more than 30% of the students missed the question, I look at it very closely to determine if it was a fair question. **If you find a question that you think might be a problem, you must provide a clear argument in writing and within one week after the exam was returned. I will not accept this argument on the day I you receive your test grades back.** I will then evaluate the question that you identified and determine if your argument is truly valid. However, the final decision on this issue will remain mine. At the end of the semester, I will go by the total number of points that were available and no adjustments to student grades will be made after all exams are completed.

Week	Date	Question	Chapter to Read
1	6-Jan	What is the science of Biology and why should I care?	Chapter 1
	8-Jan	How do scientists explain the diversity of life in the world?	Chapter 22, 23
	Lab	The Microscope	
2	13-Jan	How does natural selection impact populations?	Chapter 22, 23
	15-Jan	What is the difference between macro and microevolution?	Chapter 24
	Lab	Evolution and Natural Selection	
3	20-Jan	How have scientists tried to explain how life came to be and what are relationship among organisms?	Chapter 25, 26
	22-Jan	What is the diversity of the one-celled organisms?	Chapter 27, 28
	Lab	Simple Organisms with Cell Walls	
4	27-Jan	How did plants evolve?	Chapter 29
	29-Jan	How did seed plants evolve?	Chapter 30
	Lab	The Plant Kingdom	
5	3-Feb	How do you get a seed and develop and embryo?	Chapter 38
	5-Feb	What are the structures of a plant and how does it grow?	Chapter 35
	Lab	Flowering Plant Reproduction	
6	10-Feb	How do plants get the nutrients they need to survive?	Chapter 36
	12-Feb	How do plants get the nutrients they need to survive?	Chapter 37, 39
	Lab	Flowering Plant Structure and Function (1)	
7	17-Feb	How do plants respond to their environment?	Chapter 39
	19-Feb	What is the diversity of fungi?	Chapter 31
	Lab	Flowering Plant Structure and Function (2)	
8	24-Feb	MIDTERM - 1	
	26-Feb	MIDTERM - 2	
	Lab	The Animal Kingdom and Animal-Like Protistans (Part 1)	
9	Mar 1-5	NO CLASSES SPRING BREAK	
10	9-Mar	What is the diversity of animals?	Chapter 32, 33
	11-Mar	What is the diversity of Vertebrates?	Chapter 33, 34
	Lab	The Animal Kingdom (Part 2)	
11	16-Mar	How do organisms interact with their environment?	Chapter 50, 52
	18-Mar	How do populations interact with their environment?	Chapter 52, 53
	Lab	Community Ecology	
12	23-Mar	How are humans impacting the biosphere?	Chapter 54, 55
	25-Mar	How does an animal go about getting the nutrients it needs to survive?	Chapter 40, 41
	Lab	The Fetal Pig - External Features and Digestive System	
13	30-Mar	How does an animal go about getting the nutrients it needs to survive?	Chapter 42
	1-Apr	How does an animal maintain homeostasis?	Chapter 44
	Lab	The Fetal Pig - Excretory and Reproductive Systems; Respiratory and Circulatory Systems	
14	6-1pr	How do animals reproduce?	Chapter 46
	8-Apr	How do animals respond to their environment?	Chapter 45, 48, 49
	Lab	Pig Practical Review	
15	13-Apr	To Be Announced	
	15-Apr	To Be Announced	
	Lab	Pig Practical	
Finals Week		FINAL EXAM 2 - THURSDAY APRIL 22 - from 4:00 to 5:50 pm	