

BSC 121, PRINCIPLES OF BIOLOGY  
SPRING 2015

**COURSE DESCRIPTION:** A continuation of the study of basic biological principles common to all organisms. Evolution, diversity of life, structure, function, and ecology. Intended for science majors and pre-professional students. 3 hours lecture—2 hours laboratory; 4 credit hours (PR: BSC 120; Grade of C or better in BSC 120).

**INSTRUCTOR:** **Dr. Anne C. Axel, Office S-260, Phone 304-696-2426**  
**E-mail: [axel@marshall.edu](mailto:axel@marshall.edu)**

Please email me directly and DO NOT send communications through the Blackboard (MUOnline) site. Please be aware that emails sent to me from accounts other than Marshall.edu (e.g., gmail, yahoo, comcast) are often shunted into my junk mail folder.

To best ensure a timely response to your email, please include the following in your email:

- 1) BSC 121 in the subject line
- 2) your full name and lab section in the message
- 3) a professionally written message
  - Include a proper address—something other than Hey! I'll happily reply to Hi/Hello Dr. Axel, Dear Dr. Axel, Howdy Dr. Axel, etc. I don't reply to a simple Hey.
  - Please follow standard conventions for writing (no texting lingo, use punctuation, no all caps or all lowercase, etc.).
  - Please include your name, even if you use a signature.

**Office Hours\*: M 10 AM - noon, Th. 3-4 PM, and by appointment**

\*I make every effort to keep scheduled office hours. Please be aware that sometimes there are conflicts with required meetings, and I cannot be present. When possible, I will make announcements on muOnline if I am unable to make scheduled office hours.

**LECTURE:** MWF 8:00-8:50 AM, Corbly Hall 105

**LAB SECTIONS:** All sections meet in Science 203.

**201 M 2-3:50 PM; 202 T 2-3:50 PM; 203 W 10-11:50 PM; 204 W 12-1:50 PM; 205 T 8-9:50 AM**

**REQUIRED MATERIALS**

1. Brooker, R.J., Widmaier, E.P., Graham, L.E., and Stiling, P.D. 2008. **Biology, 3<sup>rd</sup> Edition.**
2. Response Card RFC-03 (LCD) Turning Technologies
3. Connect Plus Account Access
4. Weinstein, S. 2010. BSC 121 Laboratory Manual, Principles of Biology, Majors, 14th ed.
5. Safety goggles
6. Pechenik, J.A. Short Guide to Writing about Biology. Longman.

**COURSE OBJECTIVES:** The purpose of this course is to familiarize students with the study of living organisms. Students will be exposed to various aspects of the body of biological knowledge through an overview of all major taxonomic groups, from bacteria to mammals, including the relationships between organism form and function. At the conclusion of this course you should have concrete knowledge of the biological sciences; understand the process of science through experimentation and hypothesis testing; and hopefully gain an appreciation and a sense of wonder inspired by the complexity of living organisms.

**EXPECTED LEARNING OUTCOMES:**

- Students will synthesize information, think critically, and solve critical thinking problems.
- Students will be able to distinguish between the terms adaptation, fitness, natural selection and evolution.
- Students will identify the relationships between form and function at the levels of biological organization.
- Students will demonstrate an understanding of the methods of science used in scientific investigation by conducting scientific investigation, analyzing and interpreting data, and preparing a scientific paper.
- Students will apply principles of scientific inquiry, differentiate a theory from a hypothesis, and differentiate fact from opinion in regard to biological sciences.
- Students will practice working collaboratively through laboratory studies and experiments.

**GRADING:** Grades will be based on lecture and lab assignments as follows:

Exams (4)	48%
Final Exam	17%
Online quizzes	10%
Lab grade	25%

**GRADING SCALE:** 100 - 90 = A; 89 - 80 = B; 79 - 70 = C; 69 - 60 = D; < 59 = F

**Lecture exams:** There will be four lectures exams, plus a final. The final exam will include 25% content from previous exams. Material on examinations can include information from lectures and assigned readings/videos. Please notify me in advance if you know you will miss an exam (see Attendance Policy below). In case of university closure on an exam day, the exam will be rescheduled for the next lecture session.

**Online Quizzes:** Weekly quizzes will be posted on Connect Plus and will cover textbook reading material scheduled for the week (see Table below). Quizzes will be open for one week. You will have the opportunity to take each quiz 3 times and you may use your text and your notes. On submission you will be told which answers were incorrect. The quiz grade recorded will be the highest of the 3 attempts. After the submission time, the answers and explanations of the questions will become available for your review.

**Labs:** Your laboratory performance will account for 25% of your total course grade. This will be determined from laboratory data analyses, lab hand-ins, written lab reports and pre-lab quizzes. All lab reports, unless otherwise noted, must be handed to your TA and be on time. Neither Dr. Axel nor other TA's will accept the sheets or deliver them to your TA. Lab reports will only be accepted at the start of labs and late reports will not be accepted. You must be present in lab in order to hand in any type of lab report for credit. Lab quizzes may or may not be announced and cannot be made up.

**ATTENDANCE POLICY:** Students are expected to be on time for lectures, labs, and exams. Attendance in lectures is strongly encouraged. While attendance is not formally tracked in this class, I can get a sense of student attendance by looking at clicker data. At the end of the semester, I may use clicker data to make decisions about borderline grades.

Attendance in laboratory is **mandatory**. You are expected to arrive on time for lab and stay until all assigned work is completed.

You are responsible for any material missed by being absent. Students are responsible for all activities and announcements that occur during class and are responsible for any material missed. Missed information should be obtained from classmates NOT from your instructor.

Missed exams due to illness, death in the family, or institutional activities will be excused **only with an official university excuse**. Make-up exams will be administered for excused absences only (see University Policies section below). **ANY UNEXCUSED ABSENCE FROM AN EXAM WILL RESULT IN A GRADE OF ZERO FOR THAT EXAM.**

If you arrive for an exam after the first person has handed in their exam, you will not be allowed to take the exam.

**COMPUTER LITERACY:** I use MUOnline (<http://www.marshall.edu/muonline>) to distribute slides from my lectures, course announcements, supplementary material, and study aids. Course materials are also located on the Connect Plus website.

**ELECTRONIC DEVICES:** No electronic devices, EVER, during tests. Cell phones are to be **turned off** during lecture. Please inform the instructor should there be a need to have a cell phone on. All electronic devices (laptops, handheld computers, instant messaging devices, PDAs, cell phones, pagers, Ipads, etc.) must be turned off during class. Failure to do so may result in your dismissal from that lecture period. Audio or video recording of lectures is not permitted without prior consent of Dr. Axel.

#### UNIVERSITY POLICIES

By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on "Marshall University Policies." Or, you can access the policies directly by going to [http://www.marshall.edu/academic-affairs/?page\\_id=802](http://www.marshall.edu/academic-affairs/?page_id=802) Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

**ACADEMIC DISHONESTY IN ANY FORM WILL NOT BE TOLERATED.** All written assignments, laboratories reports, quizzes, and exams are to be independent efforts of each student. (see University Policies above). You are responsible for knowing the University's policies, which can be found in the student handbook or at these web addresses:

<http://www.marshall.edu/academic-affairs/Student%20Resources/Academic%20Dishonesty%20Policy.pdf>

<http://www.marshall.edu/library-biz/plagiarism/plagiarism.htm>

Ignorance of the policies is not an excuse. No electronic devices, EVER, during tests.

In the lab, most experiments will be done in groups, but we expect that all assignments will be written up independently. Exceptions to independent work will only be allowed in cases where you are expressly instructed to write up your assignment in groups. We also expect that all references used in your reports be properly cited.

**STUDENTS WITH DISABILITIES:** Students are entitled to receive accommodations for documented physical, learning and psychological disabilities (see University Policies above). No accommodation can be allowed until documentation is received, and it must be received several days in advance of the exams to allow me time to arrange the conditions required. For more information, please visit <http://www.marshall.edu/disabled> or contact Disabled Student Services Office at Prichard Hall 117, phone 304-696-2271.

**WITHDRAWAL:** If you are not happy with your academic performance in this class, please come see me. **The last date for withdrawal from the course is 2.** Students should keep the Withdrawal date for this semester clearly in mind. Do not just stop attending as this will result in an F on your transcripts. The Biology department does have graduate students available for tutoring.

**INCLEMENT WEATHER:** In the case that Marshall University is closed for inclement weather, class will not meet. In case of university closure on an exam day, the exam will be rescheduled to the next lecture session.

**RECORDS:** Students are encouraged to mark both the exam and answer sheet and return both at the end of the exam period. Should a question arise concerning grading, the answer sheet will be the official response. Exams and answer sheets will be kept for one semester or summer term following completion of the course. Grades will not be given or discussed over the phone or email. You must be present during lecture or lab to collect graded exams, quizzes, and lab reports. Students should keep all returned exams score sheets, quizzes, and lab reports so that their relative standing in the course can be known at any time. All grades appeals must be done formally in writing and within 10 days of the student's receipt of the graded item. Until final grades have been submitted you are expected to keep copies of all submitted and graded work (quizzes, papers, etc.).

### **TIPS FOR SUCCESS**

**A general rule of thumb for college classes is that you should expect to study about 2 to 3 hours per week outside class for each unit of credit.** This includes time for reading the text, completing homework assignments, and weekly reviewing and test preparation. Let's say the lab accounts for 1 credit of this course. That leaves 3 credit hours for lecture. Using this study time formula, plan for 6-9 hours per week outside of class for your lecture material. That's 50-77 minutes a day.

Approximately 60-70% of required lecture material will be written on the Powerpoint slides; the remaining 30-40% of required lecture material will be spoken, but will not be written on the slides. Therefore, you should be writing almost constantly during lecture.

I organize my lectures loosely around material presented in the textbook, but I do bring in additional material. I base exams on assigned readings and lecture material. EVERYTHING presented in lectures is examinable. Therefore, take notes! Simply reviewing the handouts from Blackboard are not sufficient to achieve a passing grade in this course.

You will learn a great deal of material in this course, and the exams will be comprehensive both in the scope of material covered and in the ways in which you will be asked to demonstrate how well you have learned the material. Many of you may find this somewhat difficult, as cramming and memorizing from lecture handouts just before an exam does not typically result in a high grade. You will want to develop good study habits. Among these are coming to class prepared and taking good notes. Study often; it is best to review material at least weekly, and to rewrite your notes. Ask questions in class. Use the textbook to help fill in gaps in your understanding. Connect quizzes are designed to facilitate a weekly review of the material; take the time (and opportunities) to answer all the questions correctly.

Find study habits that work for you. There are a few general rules (avoid distractions and stress, don't leave it to the last second), but aside from this different people respond very differently to different environments. Use this web page to read about different learning styles, and take the quiz to find out which ones might work best: <http://www.learning-styles-online.com/overview/>

### **Learning Assistant Program**

The Learning Assistant Program is a new program created that allows former undergraduate, BSC121 students (called **LAs**), to assist current BSC121 students in better understanding the content of the class throughout the semester. Besides having these LAs sit in and be a part of each lecture, they will provide opportunities outside of the classroom for current students to come and ask questions about classroom material covered up to that point. Each week, these “co-seminars” will offer you another way to learn the BSC121 course content from a successful student who is sitting with you IN class, and will also provide a way to share information between you and your professor.

*\*Additional information about the LA Program can be found online at [www.marshall.edu/LAProgram](http://www.marshall.edu/LAProgram).*

**“Co-seminar”** times available for your BSC121 class will be announced the first week of class.

*\*Please note you do not have to sign up beforehand for these activities, but are invited to show up to one each week.*

Tentative Course Schedule (subject to change)

Date	Topics	Text Chapter	Videos/Articles
1/12	Introduction		
1/14	Evolution	Chpt. 23 (23.1)	<i>An accidental experiment in America shows how evolution happens (The Economist)</i>
1/16	Natural Selection and Speciation		
1/19	<i>No Lecture – MLK Day</i>		
1/21	Natural Selection and Antibiotic resistance	Chpt. 23 (23.2)	
1/23	Bacteria and Archaea	Chpt. 24 (24.2-24.3); Chpt. 27	
1/26	Protists	Chpt. 28	
1/28	Plant & Conquest of Land	Chpt. 29	
1/30	Evoln of Modern Plants	Chpt. 30	
2/2	Exam Review & Study Tips, fungi	Chpt. 31	
2/4	Evoln of Modern Plants	Chpt. 30	
2/6	<b>Exam 1</b>		
2/9	Animal Diversity	Chpt. 32	
2/11	Invertebrates	Chpt. 33	
2/13	Invertebrates	Chpt. 33	
2/16	Invertebrates	Chpt. 34 (34.1-34.4)	<i>The game-changing amniotic egg (Youtube)</i>
2/18	Verts: Amniotes	Chpt. 34	
2/20	Verts: Amniotes	Chpt. 34	
2/23	<b>Exam 2</b>		
2/25	Homeostasis	Chpt. 40	
2/27	Cells of Nervous System	Chpt. 41	
3/2	Cells of Nervous System	Chpt. 41	<i>The cockroach beatbox (TEDTalk); Dogs are people, too (NYT) &amp; How do pain relievers work? (TEDTalk)</i>
3/4	Cells of Nervous System	Chpt. 41	
3/6	Muscular Skeletal System	Chpt. 44	
3/9	Digestion and Nutrition	Chpt. 45	
3/11	Energy	Chpt. 46	
3/13	<b>Exam 3</b>		
3/16-20	<b>Spring Break</b>		
3/23	Metabolism &Temp	Chpt. 46	<i>Drink smart to stay warm; A hot drink cools you faster than a cold one – myth or reality?</i>
3/25	Metabolism &Temp	Chpt. 46	
3/27	Circulation <b>Last Day to drop courses</b>	Chpt. 47	
3/30	Respiration	Chpt. 48	
4/1	Excretion	Chpt. 49	
4/3	Excretion	Chpt. 49	
4/6	Endocrine System	Chpt. 50	
4/8	Immune System	Chp. 53	
4/10	<b>Exam 4</b>		

4/13	Plant Form, Function, Transport	Chpt. 33, 38	
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4/15	Plant Transport and Nutrients	Chpt. 37 and 38	
4/17	Plant Transport and Nutrients	Chpt. 37 and 38	
4/20	Ecology Introduction & Biomes	Chpt. 54; Chpt. 25 (25.1-25.2)	
4/22	Ecology Introduction & Biomes	Chpt. 54; Chpt. 25 (25.1-25.2)	
4/24	Population Ecology	Chpt. 56 (56.1, 56.4)	
4/27	Species Interactions	Chpt. 57	Parasite tales: The jewel wasp's zombie slave (TEDTalk); <i>Why the beaver should thank the wolf</i> (NYT) Symbiosis: A surprising tale of species cooperation (TEDTalk)
4/29	Species Interactions	Chpt. 57	
5/1	Biomagnification & Climate Change	Chpt. 59.1	
5/4	<b>Final Exam, 8-10 AM</b>		