

## **Syllabus: Principles of Biology (BSC 120)**

Semester: Spring, 2014 (Sections 204, 205, 206)

Lecture Location: Room 376 Science Building (S376)

Lecture Time: Tuesday/Thursday 12:30-1:45

Lab: Room S210; Day/Time depend on section; please attend the section for which you are registered

Instructor: Elmer M. Price, Ph.D.

Office: 241Q Byrd Biotechnology Science Center

Phone: 304-696-3611

Email: pricee@marshall.edu (Please use the Subject Line: "BSC 120" so I'll know it's an important email; I get dozens of less important emails every day)

Office Hours: M-F, 10:00 – 11:00 **or** by appointment (use email to arrange) **or** just drop by my office or research lab (219 Byrd Biotech) anytime and I'll probably be able to chat.

Course Description: This course focuses on the basics of biology, providing the student a strong foundation that will prepare them for achieving excellence in advanced science courses. Broad topics such as the chemistry that supports life, metabolism, cell features and functions, genetics, biotechnology and evolution will be covered.

Credit Hours: 4

Prerequisites/Co-requisites: ACT 21; or SAT 500; or grade of "C" in MTH 121, MTH 123, MTH 127, MTH 130 or MTH 132.

### **Course Description**

This class entails the study of the basic biological principles common to all organisms, delivered through lecture and laboratory activities. The chemistry of life, cell biology, metabolism, heredity, and evolution will be addressed. **Intended for science majors and pre-professional students**

### **Student Learning Outcomes**

<b>Course Outcomes</b>	<b>Opportunities to Practice Course Outcome</b>	<b>Course Outcome Assessment(s)</b>
Articulate and describe the basic biological principles common to all organisms	In-class discussions and laboratory exercises	Examinations and quizzes
Discuss and use the scientific approach to solve problems within the field of biology	In-class discussions and laboratory experiments	Examinations, quizzes and laboratory reports
Read and analyze charts, graphs, and tables conveying scientific information	In-class discussions and laboratory exercises and experiments	Examinations, quizzes and laboratory reports
Collect, interpret, present and discuss scientific data	Laboratory experiments	Formal written laboratory report

### **Course Objectives**

- Understand the themes that run through biology
- Recognize biomolecule structures and functions
- Understand the scientific method of research and discovery
- Relate biological form to function
- Integrate metabolic pathways into cellular function
- Understand the genetic basis of diversity and heredity
- Gain a working knowledge of state-of-the-art scientific techniques
- Learn how to learn
- Learn how to think *critically* about biology

### **Required Texts**

- *Biology*, 3rd Edition, 2014, Brooker, Widmaier, Graham and Stiling, McGraw Hill, Pubs.
- *Principles of Biology Laboratory Manual*, Weinstein (this is the manual for the labs)

### **Required Hardware Gadget**

- Turning Technologies ResponseCard RF response device (aka student “clicker”). These will be used almost every lecture.

### **Required Internet Site**

Go to: [http://connect.mcgraw-hill.com/class/e\\_price\\_spring\\_2014](http://connect.mcgraw-hill.com/class/e_price_spring_2014)  
(click, or “cut and paste” into your browser’s address bar)

- Using the Connect access code that came with your book, you must register and enter the site for this particular class. All of your homework, assignments, exercises, etc. are on this site, as is the eBook and other resources. You should expect to visit and work on this site many times per week (*this is probably much less time than some of you are currently spending on Facebook or some other social media, so please think about your priorities and time management*). Also, you need to check your Marshall email **every day**.
- You should also spend time on the LearnSmart study modules that are linked on the Connect site. These on-line “flashcard” exercises are enjoyable, low pressure and self-paced ways to test your own knowledge and understanding. There is also a free Smartphone app (“LearnSmart” by McGraw-Hill) in the iTunes App Store. This allows you to study biology anytime instead of reading inane texts from your friends (“OMG look, there’s a kitten”).

### **Recommended Text**

- *A Short Guide to Writing About Biology*, Pechenik (helpful for preparing lab reports)

### **Lecture Attendance Policy**

As a student, you can't learn if you don't show up. There will be quizzes nearly every day, and these cannot be made-up; so miss a day, miss a quiz. If you have a University-excused absence, any missed quizzes will be forgiven, but only *up to five*. After more than five days of excused absences, you must meet with the instructor to receive instructions as to how the quizzes can be made up. Also, *another reason to attend class*: test questions will be derived from material presented by the instructor in class (and also from material not covered in class but found in the text). *It's not a novel concept: attend class and read the text!*

You cannot recover work missed for unexcused absences. Period. But, five of the lowest quiz scores will be dropped, so up to five of the zero's you get when you have unexcused absences will be dropped.

Please try to arrive on time. *If the student arrives late, they should quietly enter via the back of the room. It is disrespectful to the class to arrive late and noisily.*

Make-up examinations will be offered in the case of a family emergency, illness, or other university excused absence. Please make every effort to contact Dr. Price prior to the test (email will be fine) to inform him that you'll miss the test. **Students have ONE week to make-up a missed test; not doing so will result in a zero for that test.** University-excused absences are obtained through the Office of Student Affairs: Steve Hensley, Dean of Student Affairs, Memorial Student Center 2W38 (304) 696-6423  
[hensley@marshall.edu](mailto:hensley@marshall.edu)

### **Cell Phone/Electronics Policy**

Text all you want. Yes, that's right. I give up. Study after study show that texting is distracting to both you and students sitting around you, and you know this is true. You also know that this distraction leads to an inability to learn, thus an inability to get good grades. But, it's your decision; text all you want. This also applies to playing games, visiting Facebook, etc. Just know that I'll notice if you text excessively and I will know your name. You think I can't see you hiding your phone, trying to be sneaky? You guys aren't behind one-way mirrors, like what they use in "Law and Order"! I can see you! I can see the soft glow of the cell's screen reflected off your face! I can see you sharing a funny text with your classmate! I can see your body language as you play "Angry Bird"! I can see your facial expression when your BFF just LOL'd! But, please make no mistake; I...can...see...you! You may be targeted and asked questions about the lecture and you will be expected to answer. I'll even let you text the question to whomever you are texting, since it stands to reason that you feel that person is superior to your professor in your quest to learn biology. If you are paying attention, you'll get the question right; if you miss the question, **it will be because you were not paying attention!**

If individuals continue to use their cell phone excessively, and I deem it is a distraction, there will be consequences too horrible and dire to put into writing. But, you have been warned: No excessive texting or use of your SmartPhone/other gadget during lecture (or the lab for that matter). **The inappropriate use of laptops is a different story. I have zero tolerance for someone using a laptop to surf the 'net, look at Facebook, etc., because this is very distracting to those around you (unless you are in the back row). You'll be caught and asked to leave. Period.**

Please keep phone ringer on "silent".

Note: No electronic devices, EVER, during tests. Do not even get it out of your pocket, purse, backpack, etc. If we see it (and we will), you'll be asked to take your phone and leave, thus getting a "zero" for that test. If we see you actually cheating with it, you may fail the course. Don't do it, people, it's not worth the risk.

### **Grading Policy**

On average, there will be at least two on-line homework assignments (on Connect) every week, and quiz questions (using the clickers) during each lecture. In addition, there will be five exams (including a final), which along with the homework and quizzes constitute 75% of total course grade. You will be tested on lecture notes and readings from the book. Format for the exams will be multiple choice and short answer questions. Laboratory performance will contribute the remaining 25% of your course grade. Lab grades will consist of weekly data sheets, pre-lab quizzes, and a formal laboratory report. The laboratory report is mandatory for passing the laboratory portion of BSC 120. Written instructions and deadlines will be provided by your lab instructor. Students are expected to keep their finished papers on computer disk until the graded copy is returned.

Tests will be given on the dates listed on the Schedule. All tests (except the final exam) will be administered during the regular class time. Not all tests are weighted the same:

- |                               |                                    |
|-------------------------------|------------------------------------|
| - Test 1 = 10% of final grade | - Test 5 = 15%                     |
| - Test 2 = 10% of final grade | - Quizzes = 10% (worse 5 dropped)  |
| - Test 3 = 10% of final grade | - Homework = 10% (worse 5 dropped) |
| - Test 4 = 10% of final grade | - Laboratory = 25% of final grade  |

The final letter grade will be determined as follows:

A: 90-100%; B: 80-89.4%; C: 70-79.4%; D: 60-69.4%; F: <59.4%

Students have 1 week after the test scores have been returned to discuss issues with the exam that may result in changing a test score. Extra credit is not available.

### **Learning Assistant (LA) Program**

The Learning Assistant program is a formal peer-tutoring, group exercise program that is mentored by upperclassmen (typically juniors and seniors) who are former BSC 120 students. These mentors, called "LAs", will assist you in better understanding the content and concepts of the class throughout the semester.

These LAs (3-5 per class) will be present in each lecture and will constantly be "up to speed" on what is being covered and what is important for the test. LAs will provide opportunities outside of the classroom for you to perform sample test exercises and ask questions (*without your professor present*) about classroom material and concepts. Each week, these peer tutoring/mentoring sessions will offer you another way to learn the BSC120 material from students who have already experienced BSC 120, who are sitting with you IN class, and who will provide a path of communication between you and your professor. Please note you do not have to sign up beforehand for these activities. This semester's LAs: Trey Stai    Levi Kerby    Jenna Vance    Regan Stafford    Karl Shaver

### **Policy For Students With Disabilities**

Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone 304 696-2271 to provide documentation of their disability. Following this, the DSS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit <http://www.marshall.edu/disabled> or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271. Please take advantage of this opportunity as soon as possible, early in the semester.

### **Policy For Academic Dishonesty**

Please see:

<http://www.marshall.edu/president/board/Policies/MUBOG%20AA-12%20Academic%20Dishonesty.pdf> for Marshall's policy. In brief, plagiarism, threats, or complicity are all examples of academic dishonesty and students engaged in this behavior will be caught. Punishment can range from a lower grade for the test or project, to expulsion from the university.

### **Policy Regarding Inclement Weather or Other Dangerous Events**

Marshall will rarely close due to bad weather. However, when it is necessary to change the schedule every effort will be made to notify the local media. Closings and delays will be announced by these local services. If the university is open, but the student feels that the conditions are too dangerous for them to attend, they will not be penalized for missing class; please do not exploit this policy. Contact your professor as soon as reasonably possible on such days.

In the case of a fire alarm, students are to leave the building quickly and orderly. In the case of a tornado, students are to move into the hall, away from windows and doors. MUPD phone number is 696-4357 (696-HELP). You probably have a pizza joint or a nail salon on your phone's contact list; add the campus police, too. Rethink your priorities, people.

*Students are encouraged to sign up for the automatic Marshall University emergency text messaging system to be notified of emergency situations and other important announcements. To sign up, go to: myMU; log in; click on MU Alert (red triangle icon on Launchpad), and complete the information to participate in MU's emergency notification system.*

### **Learning Objectives**

The instructor has several objectives for his students during this semester. They are listed below in order of increasing significance to the student's long-term success (in science, in college, and in careers [aka your life]).

1. The gain of simple knowledge, and any student can achieve this modest objective by simply memorizing the material.

2. A more significant objective is the actual comprehension of the material. Does the student actually understand the material, or are they only parroting the material during the tests. One who comprehends the material can answer test questions using information learned in class, even if the exact question was never discussed.

3. In order to use the information learned in class in future years, the student must be capable of applying the knowledge to new events. An ability to apply new knowledge is a sign of creativity that leads to exceptional careers.

4. Finally, the best and brightest have the capacity to synthesize new paradigms, new theories, and new designs that advance their chosen field. Students must learn to create new ideas, design new experiments, and actually perform the work that yields a new information, discoveries, or technologies.

**LECTURE SCHEDULE**

The tests will be held on the indicated dates, *but the instructor reserves the right to deviate from the indicated chapters (in other words, your professor may fall behind now and then).*

**WEEK 1:**

Tuesday, Jan. 14 -----Course Introduction/Chapter 1 An Introduction to Biology

Thursday, Jan. 16 -----Pre-Semester Exam

**WEEK 2:**

Tuesday, Jan. 21 -----Chapter 2 Chemical Basis of Life I: Atoms, Molecules, and Water

Thursday, Jan. 23 -----Chapter 3 The Chemical Basis of Life II: Organic Molecules

**WEEK 3:**

Tuesday, Jan. 28 -----Chapter 4 General Features of Cells

Thursday, Jan. 30 -----Chapter 5 Membrane Structure, Synthesis, and Transport

**WEEK 4:**

Tuesday, Feb. 4 ----- **TEST 1**

Thursday, Feb. 6 -----Chapter 6 Introduction to Energy, Enzymes and Metabolism

**WEEK 5:**

Tuesday, Feb. 11 ----- Chapter 7 Respiration and Fermentation

Thursday, Feb. 13 ----- Chapter 8 Photosynthesis

**WEEK 6:**

Tuesday, Feb. 18 ----- Chapter 9 Cell Communication

Thursday, Feb. 20 ----- **TEST 2**

**WEEK 7:**

Tuesday, Feb. 25 ----- Chapter 10 Multicellularity

Thursday, Feb. 27 ----- Chapter 11 Nucleic Acids, DNA Replication, and Chromosomes

**WEEK 8:**

Tuesday, Mar. 4 ----- Chapter 12 Gene Expression at the Molecular Level

Thursday, Mar. 6 ----- Chapter 13 Gene Regulation

**WEEK 9:**

Tuesday, Mar. 11 ----- Applications/Connections/Catch-up

Thursday, Mar. 13 ----- **TEST 3**

**WEEK 10:**

Tuesday, Mar. 18 ----- SPRING BREAK

Thursday, Mar. 20 ----- SPRING BREAK

**WEEK 11:**

Tuesday, Mar. 25 ----- Chapter 14 Mutation, DNA Repair, and Cancer

Thursday, Mar. 27 ----- Chapter 15 The Eukaryotic Cell Cycle, Mitosis, and Meiosis

**WEEK 12:**

Tuesday, Apr. 1 ----- Chapter 16 Simple Patterns of Inheritance

Thursday, Apr. 3 ----- Chapter 17 Complex Patterns of Inheritance

**WEEK 13:**

Tuesday, Apr. 8 ----- Applications/Connections/Catch-up

Thursday, Apr. 10 ----- **TEST 4**

**WEEK 14:**

Tuesday, Apr 15 -----Chapter 18 Genetics of Viruses and Bacteria

Thursday, Apr 17 -----Chapter 19 Developmental Genetics

**WEEK 15:**

Tuesday, Apr. 22 -----Chapter 20 Genetic Technology

Thursday, Apr. 24 -----Chapter 21 Genomes, Proteomes, and Bioinformatics

**WEEK 16:**

Tuesday, Apr. 29 ----- Applications/Connections/Catch-up

Thursday, May 1 ----- Applications/Connections/Catch-up

**WEEK 17:**

Tuesday, May 6, 12:45-2:45 ----- **TEST 5 (FINAL EXAM, which is Comprehensive)**