

Syllabus

Course Title/Number	Introduction to Biology, BSC 104, Sections 107 and 108
Semester/Year	Fall 2014
Days/Time	Both Sections 107 and 108 meet together for lecture Tuesday and Thursday, 9:30-10:45 in S 376.
Location	You attend lab once a week in the science building. If you are in Section 107 your lab meets Wednesday at 10:00-11:50 in S 212. If you are in Section 208 your lab meets on Monday at 10:00-11:50 in S 212.
Instructor	Harold W. Elmore, Professor of Biological Sciences
Office	S 116
Phone	304-696-3632
E-Mail	elmore@marshall.edu
Office/Hours	Tuesday and Thursday, 10:45-1:15
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 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 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

Course Description: From Catalog

Fundamentals of biology with emphasis on the unity of life, energetics, genetics, evolution, classification of organisms in the kingdoms of life. Intended for non-science majors. Does not count toward a major in Biological Sciences.

Course Student Learning Outcomes

Students will comprehend the nature of science and the methods used to gather scientific information

How students will practice each outcome in this Course

- Read assignments on the scientific method.
- Discuss steps in the scientific method and the design of experiments as a group in lab.
- Record findings in laboratory notebook and answer questions that challenge understanding.

How student achievement of each outcome will be assessed in this Course

- Exam questions in lecture.
- Quiz questions in lab.
- Evaluation of group presentations by lab instructor via a rubric.

- Gather data from lab experiments and draw conclusions that substantiate or reject hypotheses.
- Present in class summary presentations of experiments.

Students will understand of the nature of biological molecules.

- Study the categories of biological molecules, their structure, function, and metabolism in lecture.
 - Perform experiments in lab on biological molecules focused on reactions carried out by specific functional groups.
 - Perform experiments on the synthesis of biological molecules and the breakdown of biological molecules, e.g., glucose synthesis via photosynthesis and oxidation via cellular respiration.
 - Perform laboratories on the function of biological molecules, e.g., synthesis of DNA and gene expression via RNA templates, protein synthesis.
 - Perform laboratories on the action of biological molecules, e.g., catalysis of reactions by enzymes which are protein in nature
- Exam questions in lecture.
 - Quiz questions in lab.
 - Evaluation of group presentations by lab instructor via a rubric.

Students will grasp the relationships between form and function at the cellular level

- Through presentation in lecture and lab work correlate microscopic examination of cell types and organelles with function and metabolism, e.g., students will see, cross sections of leaves with spongy and palisade mesophyll tissues, observe chloroplasts, study the separated photosynthetic pigments, measure light absorption, and quantitate oxygen evolution as a byproduct (used to measure the rate of the process).
- Exam questions in lecture.
 - Quiz questions in lab.
 - Evaluation of group presentations by lab instructor via a rubric.

Students will know and appreciate the link between heredity and the continuation of life

- In lecture students will learn about the structure of DNA, replication of DNA in mitosis, segregation of chromosomes (on which alleles of genes are located), segregation of the alleles, and recombination mechanisms.
 - In lab students will see nuclei, chromosomes, follow their movement in cell division, analyze genetic crosses, observe phenotypic frequencies, and determine mechanisms of heredity, e.g., dominant, recessive, multi-allelism, sex linked, etc.
- Exam questions in lecture.
 - Quiz questions in lab.
 - Evaluation of group presentations by lab instructor via a rubric.

Students will learn about modern molecular methods and how they can be used to solve crimes and to improve the organisms that man uses

- In lecture students will learn about biotechnology and its applications to in determining the likelihood DNA left at a crime scene is from an accused suspect and how methods can be used to move genes from one organism to another to benefit man, e.g., human gene for synthesis of insulin has been moved to bacteria which grow in the lab and secrete insulin used to treat diabetes.
- Exam questions in lecture.

Required Texts, Additional Reading, and Other Materials

- The BSC 104 Lab Manual is available in the MU Bookstore.
- The text is *Essential Biology*, 5th ed, by Simon, Dickey, and Reece, Benjamin Cummings.
- Online content is available in your Blackboard Account. Log in through MU Online.

Course Requirements / Due Dates

1. Lecture quizzes and exams are self-paced. The exams will be made available at a time to be specified during lecture and must be completed during that specific time window. You will also be

notified by e-mail to make you aware of the exact time schedule and deadline.

2. Lab work must be completed each week during lab period.

Attendance Policy

I consider you adults and therefore do not take attendance. However, if you do not attend regularly you will do poorly. You must complete the work in a timely manner. The university requires professors to turn in midterm grades and they will be based on completion of half the content. You are required to come to lab and a lab quiz will be administered for each lab, unless you are told a week in advance. If you miss lab you receive zero. The lab set-up cannot be reconstructed, so if you have an excuse you are may not redo the lab but will be allowed to take a makeup quiz.

Excused absences will be handled according to the university policy.

Assignments

Assignments are incorporated into the contents section of the course. Once you log on to the course click on the Contents icon. The units do not correspond to chapters. The specific pages that you need to read are included in the outline below. Students should read the assigned pages before proceeding with the content. After finishing the content use the text as a reference if there are any questions. After absorbed and assimilating the information take the unit quiz associated with each unit.

Unit Title and Reading Assignments Pages

1. Introduction: Biology Today – Science of Life 3-19
2. Essential Chemistry for Biology – Molecules of Life 23-31; 37-48
3. A Tour of the Cell – Organization and Function 56-71
4. Metabolism – Enzymatic Reactions in the Cellular Environment 75-87
5. Photosynthesis – Trapping Energy for Life 107-115
6. Respiration – Releasing Energy for the Processes of Life 91-102
7. Cell Division – Multiplication and Growth 122-129
8. Meiosis – Sorting Genetic Information for the Next Generation 130-142
9. Genetics – Mechanisms of Heredity 145-161
10. Chromosomes – Organization of the Genome 162-166
11. DNA – Database of the Cell 173-177
12. Gene Expression – Utilizing Coded Information 178-186
13. DNA Technology – Editing Heredity 219-237
14. Microevolution – Small Genetic Change in a Population 243-266
15. Speciation – Genetic Change Can Lead to Reproductive Isolation 269-277
16. Macroevolution – A Lot of Genetic Change Can Lead to the Appearance of
17. New Life Forms 278-294
18. Population Growth – Models 403-422
19. Communities – Population – Interactions Ecosystems – Community Interactions
425-436; 437-439

20. Human Impact on the Earth – Can We Survive on Spaceship Earth? 440-448

Grading Policy

Grading will be based on your performance on the exams and quizzes as follows:

Item	Percent
Lecture Quizzes	10%
Exam I	17.5%
Exam II	17.5%
Exam III	17.5%
Exam IV	17.5%
<u>Lab</u>	<u>20%</u>
Total	100%

Grading scale is as follows:

A	89.5
B	79.5
C	69.5
D	59.5
F	<59.5

Incomplete grades will be awarded only in accordance with university policy. The rules are very rigid and a request of an "I" should be avoided because it is complicated for the student and professor. However, if you have completed a minimum of 75% of the work and for some reason such as illness you deserve consideration for incomplete contact the instructor immediately.

Withdrawal from a course will leave a "W" grade on your transcript. Beware that some employers look at W grades as an indicator the student is not a finisher. It is best to avoid withdrawals but if you do you must withdraw in accordance with policy or you will be surprised by receiving "F". Talk with your professor if you anticipate a problem.

Lecture Quizzes

Mastery-of-content quizzes are to be taken over each unit. The quizzes are online and may be taken without a proctor up to three times. The top grade will count. Quizzes are intended to enable you to master the course content. Each quiz is worth a relatively small percentage of your overall grade but if you do well on them you will be prepared for the exams which are a significant percentage of your grade and which require a proctor. Try to score above 90 by the third try. Although the questions on the test are not the same as those on the quizzes they are similar. The experience of answering the quiz question enables you to know the kind of questions that will be on the exams. Be aware that when you start to take a quiz or exam it must be finished and submitted. Each of the quizzes or exams is timed so you should be aware of time and submit it before time runs out. You should have no trouble with time since the amount allowed is generous. Do not use the browser forward and back button at the top of your browser toolbar to navigate. Use the navigation provided within Blackboard. When you are finished the quiz or exam has to be submitted by clicking on the correct button. The quizzes and exams must be in taken in the order shown under assessments in the course (the link you click to gain entry to quizzes and exams). If difficulty arises e-mail the instructor.

Exams

Exams will be scheduled at the end of each set of five sections of online material. A time will be identified in class and via email. The exam will be online anywhere you wish to take it but must be completed during the required window of time. They are timed and you only get one attempt. You may go back and change answers during the exam but do not submit the exam until you are finished. Do not fail to submit the exam using the submit button. The back arrow of the browser at the upper left of the screen is not to be used in navigating in the course, quizzes, or exams. It will cut you off in the middle of the test. So do not completely submit and exit until you are finished. Use only the navigation system within Blackboard to move backwards and forth from page to page.

Lab

Your lab instructor will explain how you will be graded in lab. At the end of the course the lab grade is entered into the calculation of your overall grade according to the value explained under grading.

Course Availability

The course content and exams can be accessed by students during the semester by steps described during lecture. All work must be completed in attendance with the university calendar.

Minimum Computer System Requirements

Each student is required to have access to a computer system and an internet connection. You will need the Flash plug-in installed to view animations. If you attempt to run an animation in the course and Flash is not installed you will be asked if you want to install it. If you need help consult the Help Desk, 4th floor of Drinko Library.