

Syllabus

Course Title/Number	Introduction to Biology, BSC 104, section 109
Semester/Year	Fall 2014
Days/Time	Lecture is online.
Location	Lab meets in the science building once a week, 5:30-7:20 PM on Tuesday 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.
- Gather data from lab experiments and draw conclusions that

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.

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 appreciation the link between

- In lecture students will learn about
- Exam questions in

heredity and the continuation of life

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., dormant, recessive, multi-allelism, sex linked, etc.

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 last exam must be completed by the last day of classes. You will be notified by e-mail the exact time of the deadline.
2. Lab work each week during lab period.

Attendance Policy

The lecture is completely online. Therefore there is no attendance policy for lecture. However, 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.

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%
Lab 20%
Total 100%

Grading scale is as follows:

A 89.5
B 79.5
C 69.5
D 59.5
F <59.5

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 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 may be taken at anytime, anywhere. 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 link. 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. 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 the value explained under grading.

Course Availability

The course content and exams can be accessed by students during the semester in which they are enrolled by logging in to MUOnline. Flexibility allows the student to achieve educational goals by overcoming obstacles of time, distance, and work schedule.

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.

Characteristics of a Successful E-course Student

Your first responsibility is to yourself. You must achieve because your future success depends on your diligence. Just as you must attend class and strive to excel in an on campus course, you must also exert every effort and establish sound study practices in an E-course. Probably the most important thing that you can do is set aside blocks of time each week to work on the course. You must read your assignments in advance, and then view the lesson. Correlate the content you are reading on line with the text. Remember that you must be your own strict taskmaster. Your success depends on your willingness to do the work in a timely manner and get the job done. A potential employer will probably be pleased to see that an interviewee has successfully completed E-courses. That should indicate that the candidate for the job is self-motivated, mature, ambitious, and a person that needs little direct supervision. Good luck, you may contact your instructor by e-mail, telephone, mail, or by coming to campus to visit me in my office. I recently subscribed to an unlimited, anywhere, anytime, telephone service to enable me to keep in contact with my online students Even though distance may separate instructor and student we will work together to insure that the course is worthwhile, that you learn information that is useful, and that you complete the course successfully.