

Introductory Biology

BSC 104

Instructor: Dr. H.W. Elmore

Biographical Sketch

I was an undergraduate biology major with chemistry minor at Western Kentucky University, Bowling Green, KY, (1965-1969). After completing the Ph.D. degree in biology with a minor in molecular biology from Vanderbilt University, Nashville, TN, I was employed for three years at the University of Waterloo, Waterloo, Ontario. I returned to the US in 1976 to teach in the Department of Biology, Marshall University, Huntington, WV. I now serve as Associate Dean of the College of Science and Professor of Biological Sciences at Marshall University.

I spend a lot of time advising and working with students, helping them with steps toward goals leading to their academic success and their life's ambitions. In the deans office I track probationary and suspended students. I also serve as the Chief Pre-health Care Professions Advisor. My major role in pre-health care advising is to coordinate the preparation of student's applications to medical or other professional school. As a part of this effort I am web master of a site designed to provide information to pre-med and other pre-health care students at <http://www.marshall.edu/preprof>. I also write an umbrella letter of recommendation for each student applying to medical, dental, pharmacy, chiropractic, optometry, physical therapy, and podiatry schools.

Throughout my career I have been associated with teaching life sciences for freshmen. My teaching responsibilities have included plant physiology, plant developmental biology, introductory biology, botany, zoology, evolution, introductory biology, and integrated science for non-majors. In the classroom I attempt to stimulate learning by prompting students to think critically and to reason for themselves. In the web course I attempt to prompt student interest with information and then pose questions to determine whether they can apply information learned. I am interested in using technology in teaching in innovative ways that promote learning. My overall instructional goal is to help prepare students for the real world by fostering their ability to assimilate information, gather data, and make connections within their knowledge matrix. I want students to be problem solvers because individuals who can process information and formulate a sound response are more likely to succeed.

Distance learning is a great opportunity for many students to take classes who cannot attend a university, college, or community college. Web courses make it possible for students who otherwise could not earn credit toward a degree to make progress

regardless of where they are located. Students have taken SCI101 from North Carolina to California and from the Panama Canal Zone to an aircraft carrier somewhere in the Mediterranean. I take great pride in helping students complete an on line science course toward their degree. I really like to see people succeed since the differences in earning potential and the enjoyment of life are much greater for those completing a degree. I like to keep in close contact with my online students and aid them in completing the course successfully. I recently subscribed to unlimited phone service in order that I can talk with my students. It is very satisfying for me to see students make progress and finish the course because I feel that I will have succeeded as an instructor only when my students succeed.

My research involves the hormonal and regulatory factors that control growth and development in plants, and the control of gene expression. Most of my work has involved the study of single-celled plant suspensions cultures including those of trees. I have also been interested in polyploidy in plants and the evolution of apomictic life cycles. I have been particularly active in involving undergraduates in research projects and approximately two-dozen have co-authored scientific papers or presented their work at scientific meetings.

In my leisure time (limited as it is) I really have difficulty separating my vocation from my avocation. Because I thoroughly enjoy learning about the ever-changing, intellectual landscape of the life sciences, most of my time is spent reading science. I also like history, philosophy, novels, and science fiction. I enjoy almost all music, especially jazz. I enjoy nature and look forward to a few days each year spent on the water. A leisurely day spent float fishing on a small river with arching silver maples, tulip poplars, and black willows is a slice of time worth savoring.

Course Availability

The course is on-line in fall, spring, and some summers. The course content and exams can be accessed by students at any time. 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.

Course Description

The course is a consideration of how the processes of life are interrelated and how the principles of biology are important in the everyday life of man. Emphasis will center on current scientific issues that face human society.

Prerequisites—None

Credit—3 hrs

Course Objectives

Students will:

- comprehend the nature of science and the methods used to gather scientific information
- understand of the nature of biological molecules
- grasp the relationships between form and function at the cellular level
- know and appreciation the link between heredity and the continuation of life
- learn about modern molecular methods and how they can be used to solve crimes and to improve the organisms that man uses to support his existence on earth
- learn the structure, function, and malfunction of the human body
- understand ecology and the consequences of ignoring sound environmental practices

Textbook

There is a lab manual for the course you can pick up at the MU Bookstore.

You may use the 3rd or 4th edition of the textbook. The current edition of the textbook is Essential Biology, 4rd ed, by Simon, Reece, and Dickey, Benjamin Cummings. Pages are given below for both editions. The content of both books is adequate for the course and actually there is very little new information in the newest edition.

4th edition paperback, ISBN Number: 0321652894

3rd edition paperback, ISBN Number: 9780805368420

The cheapest way for you to go may be to rent the newest paperback version from a local bookstore.

Course Outline for Both Editions Are Listed Below—No dates are included because the student may work at his or her own pace. The course is divided into four sections and each section contains five units. Just click on course content on the home page when you log on to Blackboard.

Outline for 4th edition

Unit	Title and Assignments	Pages
1	Introduction: Biology Today – Science of Life	3-5; 14-18
2	Essential Chemistry for Biology – Molecules of Life	22-31; 37-48
3	A Tour of the Cell – Organization and Function	54-70
4	Metabolism – Enzymatic Reactions in the Cellular Environment	74-82
5	Photosynthesis – Trapping Energy for Life	107-115
6	Respiration – Releasing Energy for the Processes of Life	90-100
7	Cell Division – Multiplication and Growth	120-128
8	Meiosis – Sorting Genetic Information for the Next Generation	130-142
9	Genetics – Mechanisms of Heredity	144-161
10	Chromosomes – Organization of the Genome	162-166
11	DNA – Database of the Cell	172-177
12	Gene Expression – Utilizing Coded Information	178-186
13	DNA Technology – Editing Heredity	218-237
14	Microevolution – Small Genetic Change in a Population	242-265
15	Speciation – Genetic Change Can Lead to Reproductive Isolation	268-277
16	Macroevolution – A Lot of Genetic Change Can Lead to the Appearance of New Life Forms	278-294
17	Population Growth – Models	402-420
18	Communities – Population Interactions	428-436
19	Ecosystems – Community Interactions	437-439
20	Human Impact on the Earth – Can We Survive on Spaceship Earth?	440-448

Outline for 3rd edition

Unit	Title and Assignments	Pages
1	Introduction to Biology – Science of Life	2-6; 15-18; 21-22
2	Chemistry of the Cell – Molecules of Life	23-33; 36-50
3	Cell Structure – Organization and Function	53-68

4	Metabolism – Enzymatic Reactions in the Cellular Environment	73-83
5	Photosynthesis – Trapping Energy for Life	103-115
6	Respiration – Releasing Energy for the Processes of Life	88-100
7	Cell Division – Multiplication and Growth	119-127
8	Meiosis – Sorting Genetic Information for the Next Generation	128-139
9	Genetics – Mechanisms of Heredity	142-158
10	Chromosomes – Organization of the Genome	159-166
11	DNA – Database of the Cell	171-176
12	Gene Expression – Utilizing Coded Information	176-187
13	Gene Cloning – Editing Heredity	217-239
14	Microevolution – Small Genetic Change in a Population	243-268
15	Speciation – Genetic Change Can Lead to Reproductive Isolation	271-282
16	Macroevolution – A Lot of Genetic Change Can Lead to the Appearance of New Life Forms	282-294
17	Population Growth – Models	389-400
18	Communities – Population Interactions	407-421
19	Ecosystems – Community Interactions	421-440
20	Human Impact on the Earth – Can We Survive on Spaceship Earth?	443-464

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 indicated. 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.

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

A proctor is required for exams. When the student is ready to take an exam he/she will send an e-mail containing the name, profession, address, and e-mail address of the proctor, a responsible person (local teacher, business person, minister, commanding officer, etc.) who must be present when the exam is being taken. The proctor will not allow the use of books or notes in answering test questions. The instructor will send a password to the proctor who will then allow the student to take the exam. As is true for quizzes, time is limited. You may go back and change answers during the exam session but do not submit the exam until you are finished. After taking several quizzes in the days before each exam the process will become routine.

Lab

You meet the lab each week 9-10:50. Your lab instructor will administer a quiz unless you are otherwise told over the previous week's work. You may drop one quiz. If you have excused absences you still must make up the quiz. All lab quizzes will be averaged and count 20 % of your grade.

Grading

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

Item	Percent
Quizzes	10%
Exam I	17.5%
Exam II	17.5%
Exam III	17.5%
Exam IV, Final	17.5%
Lab	20%
Total	100%

Grading scale is as follows:

Grade	Overall Class Average
A	89.5
B	79.5
C	69.5
D	59.5
F	<59.5

Time Limit on Course Completion

You are encouraged to complete at least one of the 20 units in order, each followed by a quiz, every five days. You may work at your own pace and finish any time before the deadline at the end of the semester. You may not skip around or bypass a quiz. There is a quiz on every unit and an exam after completing quizzes 5, 10, 15, and 20. The second half of the course is much easier than the first half. If you do not adhere to a study schedule you might not complete the course on time. Please be aware that Unit 2 is the longest one and may take longer to finish. Many students think it is the most difficult. You should expect to spend at least 4-5 hrs on each unit. If you work at the recommended schedule you will finish the course. You can finish the course early by completing all quizzes and exams early. You must take the last exam by a deadline during final week on campus that will be communicated to you. The reason for this is that the professor has a deadline to submit both campus and on line grades. No incomplete grade (I) will be allowed except under the same conditions as those for which an incomplete would be given on campus. For example, a person who was in the hospital during final week would be given an incomplete I and allowed to take the final later. But, just not being finished on time is not a sufficient reason. Plan ahead, and complete the course in a timely manner.

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.