

Common Course Outline
BIOL 110
Biology I: Molecules & Cells
4 Credits

Community College of Baltimore County

Description

BIOL 110 – Biology I: Molecules & Cells serves as a prerequisite course for science and allied health majors. It stresses the basic biological principles common to all living things. Evolution and homeostasis serve as central themes for the topics which include cell structure and function (both physical and chemical); molecular, cellular and organismic reproduction; genetics; energy transformation; and biotechnology. Through class experiments students will gain familiarity with various biological techniques and principles. The emphasis of the course is directed to the process of formulating questions and hypotheses, designing experiments, and collecting, reporting and interpreting data. The laboratory introduces the student to various biological techniques and emphasizes the process of science.

Students may receive credit for only one of the following: BIOL 100, BIOL 108, or BIOL 110.

4 Credits: *3 lecture hours; 3 laboratory hours*

Prerequisites: ACLT 052 or ACLT 053 or (ESOL 052 and ESOL 054)

Co-requisite: MATH 083 or MATH 073

Overall Course Objectives

Upon completion of this course students will be able to:

1. apply the principles and assumptions that underlie scientific information and communicate these effectively;
2. apply the scientific method to simulated problem-solving situations and identify areas of potential bias;
3. use metric units of measurement and perform basic calculations using the system;
4. follow detailed directions to demonstrate the appropriate use of laboratory equipment to gather and analyze data;
5. organize data into tables or graphs (where appropriate) and draw inferences from the data;
6. demonstrate the proper use of a light microscope;
7. apply chemical principles to the functioning cell;
8. explain how a cell is the basic unit of life including the function of organelles;
9. explain the principles of bioenergetics, including the processes of photosynthesis, aerobic respiration and fermentation;
10. explain how living organisms store and process genetic information to control their life functions and activities;

11. compare and contrast asexual and sexual reproduction;
12. solve genetic problems involving simple Mendelian traits, incomplete dominance, codominance and sex-linked traits;
13. apply the principles of genetics to explain how ethnic diversity applies in the areas of genetic inheritance and disorders;
14. determine the relevancy and ethical use of biotechnological advances as they relate to human life;
15. explain the basic process for evolution in terms of variation, over production and natural selection; and
16. find, evaluate, use and cite valid sources in scientific reasoning and/or inquiry.

Major Topics

- I. Chemistry of life
- II. Characteristics and classification of life
- III. Cells
 - A. Types
 - B. Structures
 - C. Function
 - D. Microscopy
- IV. Cell membrane structure and function
- V. Cellular metabolism
 - A. Enzymes
 - B. Photosynthesis
 - C. Cellular respiration
- VI. Cellular reproduction
 - A. DNA structure and replication
 - B. Mitosis
 - C. Meiosis
- VII. Molecular genetics
 - A. Transcription
 - B. Translation
- VIII. Classical genetics
- IX. Evolution
- X. Biotechnology
- XI. The process of science
 - A. Metric system of measurement
 - B. Lab skills including proper use of scientific equipment

Course Requirements

General Information:

- Students must pass lecture and lab with a 60% to pass the course. Failure in either the lecture or the lab is an automatic F for the course.
- No more than 30% of a student's total grade may come from homework, non-proctored work or open book tests.
- Where percentages are listed for an assessment tool, the percentage is to be determined by

the campus course coordinator.

- Instructors should consult the course coordinator for the lab schedule, attendance policies, grading scales, and appropriate laboratory assessments.
- Lab schedules and assessment criteria are to be determined by the campus course coordinator. Each instructor must do all the labs when they are assigned.

Grading procedures will be determined by the individual faculty member but will include the following:

Grading/exams

Multiple assignments will infuse CCBC General Education Program objectives.

Lecture Portion:

- Lecture grades will count for 70-80% of the total course grade the remaining 20-30% will come from lab.
- At least 3 unit exams, each exam worth 10-20% of the total course grade.
- A comprehensive final exam worth 10-25% of the total course grade.

Lab Portion:

- Lab assessments will include a combination of the following: short lab reports, lab quizzes, practicals or a lab notebook.
- A formal project worth 20% of the laboratory grade is a scientific poster presentation. This assignment will allow students to demonstrate at least 5 of the 7 General Education Program outcomes.

Written Assignments: Students are required to utilize appropriate academic sources.

Other Course Information

This course is an approved 4-credit General Education course in the Biological and Physical Sciences category that fulfills the laboratory requirement. Please refer to the current CCBC Catalog for General Education course criteria and outcomes.