

Coffeyville Community College

BIOL-101
COURSE SYLLABUS
FOR
GENERAL BIOLOGY

Pam Oliver
Instructor

COURSE NUMBER: BIOL-101 **COURSE TITLE:** General Biology

CREDIT HOURS: 5

INSTRUCTOR: Pam Oliver

OFFICE LOCATION: A/S 205 (2nd floor, Arts and Sciences Building)

OFFICE HOURS: See schedule posted on door

OFFICE PHONE: 620-251-7700 ext. 2070

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PREREQUISITE(S): None

REQUIRED TEXT AND MATERIALS: *Campbell Essential Biology with Physiology*
PEN OR PENCIL should be brought to EVERY class session!

COURSE DESCRIPTION: This is an introductory course designed to teach the relationship of humans to other living things, as well as the basic chemistry, physics, and physiology associated with living things. This course is appropriate for both majors and non-majors who wish to further their education concerning life (bios) in general.

EXPECTED LEARNER OUTCOMES: Upon completion of this course, the student will be able to:

1. Understand the nature of science
2. Understand the levels of organization and emergent properties of life
3. Understand bioenergetics
4. Understand the importance of reproduction in maintaining the continuity of life
5. Apply the principles of genetics to unity and diversity of life
6. Discuss evolution as the mechanism of change
7. Understand the principles of ecology
8. Mastering of laboratory topic/skills for biology student

LEARNING TASKS & ACTIVITIES: General Biology is a five hour class, consisting of 3 credit hours lecture and 2 credit hours lab. The points from lecture and lab are combined for one grade.

Lecture class will consist of traditional lecture using power-point and note-taking. Bring your textbook, handouts, paper, pencil/pen, and a highlighter to class.

Lab class will consist of a general introduction to the lab followed by handout-guided laboratory activities that may include one of the following activities:

1. Laboratory Activities, demonstrations, and experimentation
2. Videos with worksheets
3. Projects and Presentations

ASSESSMENT OF

OUTCOMES:

The student's final grade will be based on the following:

1. 5 lecture tests @ 100 points	5. Laboratory assignments 200 points
2. Comprehensive Final @ 100 points	6. Attendance & Participation 100 points
3. Two lab tests @ 100 points	7. Misc. Quizzes and/or Assignments

GRADES:

Grades will be based on total points earned divided by points possible. The grading scale in this course is A (100-90%), B (89-80%), C (79-70%), D (69-60%), F (59-0%).

Incompletes given at the end of the course will only be given if previously agreed upon by the student and instructor. Please note the college's policy on incompletes as stated in the college catalog.

- ◆ Late assignments will be **docked 10% per day**.
- ◆ Lecture tests can be made up only with the approval of the instructor and only if arrangement with the instructor is **made within 24 hours** of the scheduled exam.
- ◆ If the instructor approves a make-up exam—it **must be taken within one week** of the missed exam!
- ◆ Attendance/Participation points and pop quizzes **CANNOT BE MADE UP!!**
- ◆ **Laboratories CANNOT BE MADE UP!!** To help with this, 2 lab scores will be dropped from your final grade.
- ◆ **LAB EXAMS CANNOT BE MADE UP!**

ABSOLUTELY NO EXTRA CREDIT IS GIVEN IN THIS CLASS!

ATTENDANCE POLICY:

Students are expected to attend all classes. It is the responsibility of students to make definite arrangements for all work before going on field trips or other College-sponsored trips. School-sponsored activities will be counted as excused absences provided students complete all necessary assignments as designated by the instructors and the activity sponsors notify the instructors at least three (3) days prior to the day(s) the students will be absent. Non-participatory behavior (such as sleeping or text messaging) during lecture will be treated as an absence. Attendance will be taken at the beginning or end of class. **If the student is not present when attendance is taken, the student will be counted absent for the class period.**

ACADEMIC INTEGRITY:

Academic Dishonesty of any kind on will render the offender liable to serious consequences such as a zero and possibly suspension from the class. The following are examples:

1. Illegal possession of an exam
2. Use of unauthorized materials on an exam, such as: the book, notes, electronic device or other student.

3. Assisting others to cheat
4. Alteration of grade records or unauthorized entry into office
5. Offering the work of another as one's own

COURSE

OUTLINE: The following units will be covered during the semester.

UNIT I: Scientific Method, Characteristics of life, Levels of Organization, Chemical Levels

UNIT II: Cell biology, including membrane function, mitosis and cancer

UNIT III: Meiosis and Reproduction, Mendelian Genetics, and Molecular Genetics

UNIT IV: Natural Selection and Survey of Life

UNIT V: Ecology, Ecosystems, and Biomes, Environment and Current Issues

COMPETENCIES: Upon completion of this course; the following objectives should be accomplished by the student.

UNDERSTAND THE NATURE OF SCIENCE

1. Understand the legal definition of science
2. List the steps of scientific method in order.
3. Explain what happens in each step of scientific method and understand terminology.
4. Be able to recognize a scientific hypothesis
5. Define homeostasis and state its relationship to positive and negative feedback systems.

UNDERSTAND THE LEVELS OF ORGANIZATION AND EMERGENT PROPERTIES OF LIFE

1. List the particles of an atom and relate the structure of an atom to its chemical properties.
2. Name the four elements that comprise 96 percent of living matter.
3. Name four types of chemical bonds.
4. Know what element is in all organic molecules
5. List the organic molecules that all living things have.
6. List what each organic molecule is composed of and its properties.
7. Describe the cell theory and the emergence of cytology as a science.
8. Differentiate between eukaryotic and prokaryotic cells.
9. List the cellular organelles, indicating the functions of each.
10. Describe the physical properties of cell walls and membranes.

UNDERSTAND BIOENERGETICS

1. Describe diffusion, osmosis and active transport and how each functions to move substances in biological systems.
2. Describe the difference between a hypotonic and hypertonic environment and how they affect movement of water.
3. Describe how the ATP molecule is formed and its role in energy transfer.
4. Define the process of cellular respiration.
5. Explain oxidation-reduction reactions.
6. Define glycolysis and how sugar is broken down to pyruvate.
7. Describe the difference between aerobic and anaerobic respiration.
8. Know how energy is expressed.
9. Describe the Krebs cycle and know how many molecules of ATP would be produced.

UNDERSTAND THE IMPORTANCE OF REPRODUCTION IN MAINTAINING THE CONTINUITY OF LIFE

1. Describe how cells reproduce by listing the phases of mitosis.
2. List the stages of meiosis and describe how meiotic events halve the chromosome numbers during gamete formation.
3. Describe asexual reproduction and give examples.
4. Describe the reproductive strategies involved in internal and external fertilization.
5. List the reproductive structures of human male and female and describe the functions of each.
6. Explain how the menstrual cycle is regulated.
7. Describe how hormones control sexual development and response.
8. Describe how conception occurs.
9. List the types of contraception and their effectiveness in preventing pregnancy.

APPLY THE PRINCIPLES OF GENETICS TO UNITY AND DIVERSITY OF LIFE

1. Describe the components and arrangement of the DNA molecule.
2. Explain how the DNA molecule replicates.
3. Describe how chromosomes direct the production of proteins.
4. Compare RNA's properties to those of DNA.

5. List Mendel's principles and describe how his experimental crosses illustrate each.
6. Use a Punnett square to predict phenotypic and genotypic ratios of genetic crosses.
7. Describe how sex chromosomes determine gender.
8. List sex-linked traits.
9. Define gene and allele.
10. Define karyotype.

DISCUSS EVOLUTION AS THE MECHANISM OF CHANGE IN BIOLOGY

1. Name the domains and kingdoms into which living things are grouped.
2. Describe how an organism is classified and named.
3. Define adaptation.
4. Define species
5. Describe the process of speciation
6. Describe natural selection and its effect on a species.
7. Describe the geological time scale, list the era, dominant life form and age.
8. Describe Industrial Melanism.

UNDERSTAND THE PRINCIPLES OF ECOLOGY

1. List the components of an ecosystem.
2. List the types of consumers within a food chain and explain why their feeding patterns are best described as food webs.
3. Describe the characteristics of six major types of biomes.
4. Describe what air pollution is and list the gasses responsible.
5. Explain the major source of Water Pollution.
6. Describe cultural eutrophication and name the nutrients associated with it.
7. List two heavy metals in the biosphere and explain why they are taken up in the food chain.
8. Name two types of chlorinated hydrocarbons and their uses.

MASTERING OF LABORATORY TOPICS/SKILLS FOR THE BIOLOGY STUDENT

1. Microscopy skills
2. Quantitative measurement skills incorporating the metric system
3. Analytical and statistical skills including presenting and/or interpreting graphs, tables, etc.
4. Experience with living organisms
5. Identification and proper use of laboratory equipment including the most current technology available
6. Field experience
7. Basic biochemistry
8. Organismal and cellular structure and function
9. Classification/taxonomy
10. Evolution/natural selection
11. Genetics
12. Reproduction (cellular and organismal)