

University College of the Cayman Islands

ASSOCIATE DEGREE SYLLABUS

COURSE NAME: COLLEGE BIOLOGY/LAB I

COURSE #: BIO 101

COURSE DESCRIPTION

The purpose of this course is to introduce students to basic biological concepts. Topics include the classification of organisms, Prokaryote and Eukaryote cell organelle structure and function, followed by basic tissue composition of organs and organ systems of plants and animals. The chemicals of life and cellular transport methods, enzyme action are investigated using a variety of biological techniques. This course is required for Bio102 and entry into Pre-Medicine and Marine Biology courses. Credits: 4 Prerequisite: NONE

COURSE OBJECTIVES

At the completion of this course the student will be able to:

- Classify organisms into their Kingdom and Phylum by observing their characteristics.
- Show concern and care for living organisms obtained from the environment. Return them to their habitat after investigations of ecosystems.
- Compare the structure and function Prokaryotes and Eukaryote organs and organ systems.
- Demonstrate knowledge and skill in the use of the microscope.
- Describe the role of DNA in cells.
- Model the structure and function of the basic chemicals of life; test common biochemicals.
- Describe the underlying principles of enzyme action with named examples.
- Apply biological knowledge, skill and understanding in the techniques, procedures and principles concerning the use and preparation of microscope slides.
- Select and use appropriate techniques to carry out experimental activities.
- Analyze and interpret experimental results.
- Communicate biological information coherently in Reports by means of tables, diagrams, labeled drawings and graphs.

COURSE OUTLINE

CLASSIFICATION of ORGANISMS and ECOLOGICAL RELATIONSHIPS

The Kingdoms of Life and a brief history of taxonomy

Observation of organisms to draw and label features used for classification

Describe the ecological relationships of organisms as seen in food chains and food webs

Give examples of terrestrial and aquatic ecosystems naming examples of endemic plant and animal species

Draw carbon and water cycles, and show energy flow in a pyramid

BASIC CELL STRUCTURE

Become competent in the use of a light microscope; compare with the electron microscope

Note the similarities and differences in the structure of pro- and eukaryote cells

Identify organelles in a detailed study of typical animal and plant cells

List the main functions of organelles in plant and animal cells

MOVEMENT IN AND OUT OF CELLS

Describe the structure and function of cell membranes

Distinguish between diffusion, osmosis, exocytosis, endocytosis, and active transport methods of molecular movement between cells

Demonstrate cell molecular transport methods practically

CHEMICALS OF LIFE and MITOSIS

Model the molecular structure of carbohydrates, lipids, proteins, and nucleic acids

Describe the role of elements, ions and molecules in living organisms

Observe and report on the structure and properties of water as utilized by living organisms

Demonstrate and report on biochemical tests for biological molecules.

Role of DNA - model basic role of chromosomes in cell division by mitosis and meiosis

Document stages of cell division by Mitosis, for organism growth, repair and tissue formation. Observe microscopic tissues showing stages of mitosis

ENZYMES

Model structure and mode of action of named cellular enzymes including catalase

Describe how named specific enzymes catalyze particular biochemical reactions in cells

Demonstrate practically the effect of pH and temperature on a named enzyme

TISSUES, ORGANS AND ORGAN SYSTEMS

Draw and describe the structure and function of a variety of animal tissues

Draw and describe examples of plant tissues

Observe and draw dicotyledon leaf structural layers; state functions of tissue layers

Name the leaf tissue layers, noting distribution and function of chloroplasts and stomata

Identify leaf vascular bundle xylem and phloem tissues in relation to the movement of water, salts and synthesized biological molecules throughout the plant

List the basic conditions necessary for photosynthesis; test for starch in a leaf

BIOLOGICAL TECHNIQUES

Laboratory safety techniques

Appropriate dissection skills on whole plants and animals or their organs

Demonstrate competency at making observations and drawing with labels

Hypothesize competently and appropriately; plan investigations based on the hypothesis

Measure and collect data accurately; record in data tables

Conclude with reference to how the data support or reject the hypothesis

Discuss, analyze and evaluate all class and Lab exercises

Present scientific information clearly to an audience: give a talk, power point; add poster, brochure, video, photographs, recording, CD, DVD, etc.

ASSESSMENT

Semester Assignments, Labs, tests, project and presentation	40%
Mid-Semester Examination	20%
Final Examination	40%
Total	100%

REQUIREMENTS

Taylor, Green and Stout, Biological Sciences 1 and 2. CUP, most recent editions.
[available at UCCI Bookshop]

FOR FURTHER READING

Journals in the UCCI Library

Cayman Islands Reference section

Check internet Wikipedia.com +
browsers for vocabulary.

Internet access to ANGEL website

Biology

Chemistry.

And more – ask at the desk.

YOU WILL NEED - Notebooks, files, plain, graph and writing paper, ruler, calculator.

Lab clothing suitable for indoor and outdoor wet and dry Labs.

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