BIOLOGY 0110

COURSE OUTLINE

Fall 98

Prepared: August 7, 1998

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Textbook: *Modern Biology*, Albert Towle, Holt, Rinehart, and Winston.
ISBN: 0-03-074882-8

Supplies: paper, lined and unlined
three-ring binder
stapler
lab coat is recommended but not mandatory

Course Goals:

This course is designed to provide the student with an understanding of some of the biological principles: characteristics of life, scientific method, cell theory, structure, classification and diversity of living organisms. The course will explore the structure and function of living organisms using selected examples of organisms from the five biological kingdoms. The lab component of the course will give students an opportunity to obtain hands-on experience with organisms, and to develop biology lab and scientific skills.

Attendance and Lateness:

Regular attendance is crucial for passing the course. Students who miss class will soon find themselves falling behind and failing.

Lateness will not be tolerated. It disrupts your fellow students.

Tests and Exams:

There will be several tests throughout the term. There will also be a midterm and a final exam. Absence from a test or exam **will result in a mark of zero** . You will Not be permitted to have a makeup test unless you have called and either talked to me or left a message on my answering machine BEFORE the test. It is up to the instructor to determine if a makeup test will be provided. Absence from the midterm or final requires a doctor's certificate

Labs and Lab Reports:

There will be approximately nine labs during the course. Evaluation of the labs is either through a lab quiz and/or a lab report. Due dates for labs will be announced during the lab period.

Evaluation:

Labs 20%
Tests 30%
Midterm Exam 20%
Final Exam 30%

UNIT 1:	**THE NATURE OF SCIENCE**	
pg 5	1.	Define Science. Define Biology.
	2.	List some biological fields of study and biological themes.
pg 17-23	3.	Outline and identify the main steps in the Scientific Method. Explain their importance.
	4.	State the function of the control, variable and experimental group in an experiment.
UNIT II.	**UNDERSTANDING BIOLOGICAL CONCEPTS AND TOOLS**	
pg 25-26	1.	Define magnification and resolution.
	2.	Differentiate between the light microscope and the electron microscope. Observe pictures in the textbook and determine if they were taken with a light microscope or an electron microscope.
handout	3.	Label the parts of the light microscope. State their function.
	4.	Draw, title, and label lab drawings.
	5.	Define cross section, longitudinal section and whole mount.
UNIT III:	**INTRODUCTION TO BIOLOGY**	
pg 11-12	1.	List and explain the characteristics and requirements of living things.
pg 63-65	2.	Differentiate between unicellular organisms and multicellular organisms.
	3.	Discuss the contributions of Hooke, van Leeuwenhoek, Schleiden, Schwann, and Virchow to the development of the cell theory.
	4.	Relate the size and structure of a cell to its function.

pg 66-74	5.	Describe the structure and function of the following cell parts: organelle, protoplasm, nucleus, nucleolus, nuclear envelope, chromatin, chromosomes, cell membrane, cytoplasm, ribosomes, endoplasmic reticulum, Golgi apparatus, mitochondria, lysosomes, cilia, flagella, cell wall, vacuoles, and chloroplasts.
pg 66 & 73	6.	Label typical animal and plant cells.
pg 77	7.	Compare plant and animal cells.
pg 65	8.	Differentiate between prokaryotes and eukaryotes.
pg 74-75	9.	Outline the hierarchy of life including cells, tissues, organs, organ systems and organisms.

UNIT IV. INTRODUCTION TO CLASSIFICATION

pg 266-274	1.	Explain the need for the classification of organisms.
	2.	Discuss the contributions of Aristotle and Linnaeus to the Science of Classification.
	3.	Outline the levels of classification.
	4.	Explain and apply the binomial nomenclature system.
	5.	List the criteria used in modern taxonomy.
	6.	Use a taxonomy (dichotomous key) to identify organisms.
	7.	Name and summarize the characteristics of each of the five kingdoms: Monera, Protista, Fungi, Plantae, and Animalia.

UNIT V SIMPLE ORGANISMS

A. Viruses

pg 288	1.	Draw and label a simple bacteriophage.
notes	2.	Explain why viruses can be considered living or non-living. (Use Unit III, objective 1 as a guide.)
pg 288	3.	Draw and summarize the lytic cycle (life cycle) of the bacteriophage.
notes	4.	List six diseases caused by virulent or pathogenic viruses.
notes	5.	Discuss the problems involved with studying viruses, and prevention and cure of viral diseases.

B. Kingdom Monera

pg 295	1.	Name and describe the three general shapes of bacteria.
pg 300-302	2.	Discuss the structure, nutritional requirements, respiration, and reproduction of bacteria.
notes	3.	List six diseases caused by pathogenic bacteria.
notes	4.	State the importance of bacteria to humans and to the living world.

C. Kingdom Protista

notes	1.	List the general characteristics of the Kingdom Protista
notes	2.	Give examples of and briefly describe the structure of three types of protista.
pg 309 pg 311-313	3.	Define protozoan.

pg 323 & 327	4.	Describe the structure, movement, reproduction , nutrition, and response of the following protista: *Ameba, Paramecium, Euglena* and *Spirogyra*.
notes	5.	Name two diseases caused by pathogenic protozoans.
pg 324-325	6.	State the importance of algae.

D. Kingdom Fungi

pg 335	1.	List the general characteristics of Fungi.
pg 338	2.	Describe the structure, reproduction and nutrition of *Rhizopus*.

UNIT VI. KINGDOM PLANTAE

A. Non-Seed Plants

notes	1.	Give the general characteristics of plants
pg 365	2.	State how land plants are adapted to life on land.
pg 369	3.	Outline the general characteristics of the Division Bryophyta.
notes	4.	Define sexual reproduction, asexual reproduction, meiosis, haploid , diploid and alternation of generations.
pg 401-402	5.	Draw, label and discuss the life cycle of mosses.
pg 403-404	6.	Explain how ferns are further adapted to life on land.
	7.	Draw, label and discuss the life cycle of ferns.
	8.	Compare the life cycle of the moss to the life cycle of the fern.

B. Seed Plants

pg 371	1.	Differentiate between a seed and a spore.
	2.	Explain the statement "seeds are an evolutionary success story".
	3.	Define gymnosperm. Name three divisions of gymnosperms.
pg 403-404	4.	Outline the life cycle of conifers.
pg 375-376	5.	Give the two divisions of Angiosperms. State the differences.
	6.	Distinguish between monocots and dicots.
pg 405-406	7.	Label the parts and give the functions of the parts of the flower: receptacle, sepals, petals, anther, filament, pistil, style, stigma, ovary, ovules, stamen. Which are essential parts, and which are non-essential parts?
pg 406-410.	8.	Describe pollination, fertilization, seed formation and fruit production in angiosperms.
pg 411-412	9.	Draw an label a monocot seed and a dicot seed.
notes	10.	List 5 ways seeds are dispersed.

UNIT VII. **KINGDOM ANIMALIA**

a. Simple Organisms

notes	1.	Describe the general characteristics of animals.
pg 437	2.	Define symmetry and distinguish between asymmetry, radial and bilateral symmetry.
	3.	Define lateral, dorsal, ventral, posterior and anterior.

pg 441-443	4.	Discuss structure, feeding, reproduction and respiration of Porifera.
pg 446-447	5.	Describe the basic structure and functional characteristics of the coelenterates with emphasis on *Hydra*.
pg 454-455	6.	Outline the general characteristics of the Phylum Platyhelminthes.
pg 454-457	7.	Draw a planaria. Discuss its nutrition, digestion, excretion, nervous control, respiration and reproduction.
	8.	Draw a tapeworm. Outline the life cycle of the tapeworm.
pg 511 & pg 465-466	9.	Give the general characteristics of mollusks and echinoderms.
pg 471	10.	Give the general characteristics of the Phylum Annelida. Label an earthworm. Discuss the earthworm's structure, feeding and digestion, circulation, respiration and excretion, nervous control, and reproduction.

B. Complex Animals (Time permitting)

pg 479	1.	State the general characteristics of Arthropoda.
notes	2.	Distinguish among the major classes of arthropods: arachnids, crustaceans, insects, diplopods, and chilopods.
pg 482	3.	Label the external and internal structures of the crayfish.
pg 493	4.	List the major reasons of the success of insects.
pg 497	5.	Label the external features of the grasshopper.
pg 537	6.	Describe the major characteristics of Phylum Chordata and Subphylum Vertebrata.
notes	7.	Describe the main characteristics of the classes Agnatha, Amphibia, Reptilia, Aves, Osteichthyes, and Mammalia.