Student Service

SEP 12 1989

BIOLOGY 120

Course Outline 1989-90

FALL 1989

INSTRUCTORS:	Alberto J. Rodriguez (Part 1, Sept.7-Oct. 27) Nancy Lamoureux (Part 2, Oct. 30-Dec. 12)
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OFFICE HOURS:	As posted
EQUIVALENCY:	Biology 20 (5 credits)
TEXTBOOK:	Modern Biology, by Albert Towle

COURSE DESCRIPTION:

This course is designed to provide the student with an understanding of some basic biological concepts: interdependence of organisms and their environment (ecology, mans' impact on the environment, the basis of heredity (genetics)) and evolution. The student will also further develop basic biology laboratory skills: use of the microscope, observation skills, and the collection and analysis of data.

ATTENDANCE AND LATENESS:

Regular attendance is expected from all students and is essential for passing the course. Attendance will be taken at each class. Students who miss classes will soon find themselves falling behind and failing.

Students missing 20% or more of classes may not be permitted to write the final exam.

Lateness will not be tolerated. Classes start at the stated times, so please arrive a few minutes early.

TESTS AND EXAMS:

Absence from quizzes or exams will result in a mark of 0 for that quiz or exam unless previous arrangement is made with the instructor when absence is for medical or other legitimate reason.

LATE DEDUCTIONS:

Assignments and lab reports are due on the dates announced in class. Late penalties may be awarded as follows:

1 day late - 25%: 2 days late - 50%: 3 days late - mark of 0.

Once labs or assignments have been returned, no further papers will be accepted.

LABS:

There will be nine labs during the course, starting in the second full week of the semester. This important component of the course introduces basic laboratory skills and problem-solving and reinforces concepts introduced in lecture. A lab coat is optional but recommended for biology labs.

Attendance is compulsory for labs and missing labs will reduce your grade considerably. No reason other than a written medical excuse will be acceptable for absences. Three or more labs missed or reports not submitted, will result in an incomplete standing for the course.

EVALUATION: The Stanine grading system is used.

Stanine	Description	Percentage Equivalence
9	Outstanding	90 - 100
8	Excellent	80 - 89
7	Very Good	72 - 79
6	Good	65 - 71
5	Pass	57 - 64
4	Pass	50 - 56
3	Fail	45 - 49
2		26 - 44
1		0 - 25

Evaluation Breakdown:

Part 1 (Ecology) :	Tests	10%
	Labs	10%
	Assignments	5%
Option A	Final Exam	25%
	or	
Option B	Final Exam	20%
	Project	5%
		50%
Part 2 (Genetics) :	Tests	10%
	Labs	10%
	Assignments	5%
Option A	Final Exam	25%
	or	
Option B	Final Exam	20%
	Project	5%
		50%

COURSE CONTENT:

Part I

Unit 1: Photosynthesis: solar energy, chlorophyll and other pigments, chemistry of photosynthesis, leaf structure.

Unit 2: Ecosystems: basic ecological concepts - ecosystems, energy flow; chemical cycles.

Unit 3: Ecology of Populations: population characteristics, population growth, population regulations, competition, predation, symbiosis.

Unit 4: Ecology of Communities: terrestrial and aquatic biomes, succession.

Unit 5: Human Ecology: human ecosystems, pollution, man's impact on the environment, human population growth, resource consumption.

Part II

Unit 1: Cell Division: mitosis and meiosis

Unit 2: Heredity: Mendel's Laws, basic concepts of inheritance, polygenes, multiple alleles, incomplete dominance, codominance, linkage, sex-linkage, human genetic disorders.

Unit 3: Molecular Basis of Heredity: DNA and RNA, protein synthesis, regulation genes, mutation.

Unit 4: Evolution: evidence for evolution, mechanisms of evolution, speciation.

UNIT OBJECTIVES

Unit 1: Photosynthesis (Chap. 7-pp. 92-94, 96-98, 103; Chap. 26 pp. 393-396)

1. State the importance of photosynthesis to all living things.
2. Give the overall word and chemical equations for photosynthesis.
3. Describe the structure of the chloroplast and relate the structure to its function.
4. Describe the role of chlorophyll and other plant pigments in photosynthesis.
5. List and explain factors affecting photosynthesis: light intensity, temperature, CO_2 concentration.
6. Distinguish between the two subreactions of photosynthesis: the "light" reaction and the "dark" reaction.
7. Compare photosynthesis and cellular respiration.

Unit 2: Ecosystems (Chap. 49-pp. 764-766; Chap. 50-pp. 780-791)

1. Define: ecology, biosphere, ecosystem, population, community.
2. Distinguish between the biotic and abiotic components of an ecosystem.
3. Distinguish between habitat and niche.
4. Describe the nature of energy flow in ecosystems.
5. Define the major biotic components of an ecosystem: producers, consumers, and decomposers.
6. Distinguish between food chains, food webs, and food pyramids.
7. Define: trophic level, herbivore, carnivore.
8. Describe energy loss in food pyramids.
9. Define: biomass.

10. Describe and explain chemical cycles: the carbon cycle and the nitrogen cycle.

11. Define: nitrogen fixation, nitrifying bacteria, de-nitrifying bacteria.

Unit 3: Ecology of Populations (Chap. 51-pp. 796-802; Chap. 52-pp. 810-814)

1. Define: population, biotic potential, environmental resistance, carrying capacity.

2. Describe and explain population growth patterns: The sigmoid growth curve and expontential growth.

3. Describe characteristics of populations.

4. List and explain factors which regulate population size.

5. Distinguish between density - independent and density - independent factors.

6. Describe how competition and predation affect population size.

7. Define and explain the competition exclusion principle.

8. Describe and explain adaptations of predators and prey.

9. Define: symbiosis, parasitism, commensalism, mutualism, and give examples of each.

10. Discuss the effects of symbiosis on population size.

Unit 4: The Ecology of Communities (Chap. 49-pp. 767-776; Chap. 51-pp. 803-806)

1. Discuss the concept of the community and characteristics of communities.

2. Define: succession, sere, pioneer community, climax community.

3. Explain the process of succession in given communities (on rocks, in coniferous forest, in a lake).

4. Distinguish between primary and secondary succession.

5. Name and give the locations and characteristics of major terrestrial biomes: deserts, tundra, prairies, coniferous

forests, deciduous forests, and tropical forests.

6. Identify and explain factors which determine the type of biome found in a given location.

7. Describe the major characteristics of freshwater biomes: lakes and ponds, and rivers and streams.

Unit 5: Human Ecology (Chap. 24-pp. 359-360; Chap. 52-pp. 815-816; Chap. 53-pp. 820-826)

1. Compare human and natural ecosystems.

2. Discuss sources and effects of air pollution, land pollution and water pollution.

3. Discuss effects of air pollution on the weather; eg. the greenhouse effect.

4. Discuss problems associated with man's impact on the environment: monoculture, biocides, irrigation, fuel consumption, soil quality, garbage.

5. Suggest ways in which resources could be used more efficiently and wisely.

6. Discuss the growth curve of the human population.

7. Define: growth rate, doubling time.

8. Compare population growth rates in developed and developing countries.

9. Discuss the impact of human population growth on resource consumption: energy sources, food, stable human population size.