1990-91

Registrar

SEP 17 1990

BIOLOGY 120

Course Outline

FALL 1990

INSTRUCTOR: Gordon Pellerin

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ACADEMIC DEVELOPMENT SCIENCE CO-ORDINATOR: Nancy Lamoureux
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EQUIVALENCY: Biology 20 (5 credits)

TEXTBOOK: Modern Biology, by Albert Towle, Holt Rinehart Winston, 1989 Edition

SUPPLIES: White, unlined paper, lab coat, optional but recommended

CLASS AND LAB TIMES: TR 1:30-2:20, F 1:00-1:50, M 12:00-1:50

ATTENDANCE AND LATENESS: Regular attendance is expected from all students and is essential for passing the course. Students who miss classes will soon find themselves falling behind and failing. Lateness will not be tolerated as it interrupts the instructor and fellow classmates.

TESTS AND EXAMS:

Absence from quizzes or exams will result in a mark of 0 for that quiz or exam. A medical certificate will be required when absence is for medical reasons, at which time the instrructor will use his or her discretion as to whether the student is eligible to write a make-up exam.

ASSIGNMENTS & LAB REPORTS:

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

1 day late - 25%
2 days late - 50%

No labs or assignments will be accepted after 2 days late!

LABS:

Attendance is compulsory for all labs. A passing grade must be obtained in the lab section in order to pass the course. A student who fails the lab component will be given an incomplete (IN) on his/her transcript. A missed lab will result in a mark of 0 for that lab. A medical certificate verifying an accident or illness is required if the student wishes to have an opportunity to make-up the lab at the later date. This make-up lab, however, can not be guaranteed.

COURSE OVERVIEW:

This course is designed to provide the student with an understanding of some basic biological concepts. The course is divided into two sections - ecology and genetics. Ecology involves the interdependence of organisms and their relationship with the environment. Genetics involves the study of heredity and how traits are passed down from generation to generation. The laboratory component of the course is designed to aid the student in developing biological laboratory skills such as observation, and the collection and analysis of data.

EVALUATION: The course is divided into two main parts

Part I Ecology	
Part II Heredity and Evolution	
Lab Reports	10%
Essay Part I	5%
Essay Part II	5%
Assignments/Quizzes/Tests	20%
Part I Exam	30%
Part II Exam	30%
	100%

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. Define the major biotic components of an ecosystem: producers, consumers, and decomposers.
5. Distinguish between food chains, food webs, and food pyramids.
6. Describe the nature of energy flow in ecosystems.
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 exponential growth.
3. List and explain factors which regulate population size.
4. Distinguish between density - independent and density - independent factors.
5. Define and calculate population growth rates, population density and rate of density change.
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.