BIO 2A Course Outline as of Fall 2000

CATALOG INFORMATION

Dept and Nbr: BIO 2A Title: FUNDAMENTALS OF BIO
Full Title: Fundamentals of Biology
Last Reviewed: 8/14/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	5.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	5.00	Lab Scheduled	6.00	6	Lab Scheduled	105.00
		Contact DHR	0		Contact DHR	0
		Contact Total	9.00		Contact Total	157.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 262.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	BIO 1.2

Catalog Description:
Intended for majors in the biological sciences, pre-medical or related pre-professional programs. Phylogeny of animals with emphasis on development, morphology, physiology and behavior. Principles of evolution and population genetics. Methods of science and biostatistics. Field trips taken. (Formerly Biology 1.2)

Prerequisites/Corequisites:
Advanced Placement (AP) High School Biology with a score of 3-4 or Bio 10 with a grade of "C" or better and Chem 1A or equivalent.

Recommended Preparation:
Course Eligibility for ENGL C1000 (or ENGL 1A)

Limits on Enrollment:

Schedule of Classes Information:
Description: Intended for majors in the biological sciences, pre-medical or related pre-professional programs. Phylogeny of animals, with emphasis on development, morphology, physiology and behavior. Principles of evolution and population genetics. Methods of science and biostatistics. Field trips taken. (Grade Only)

Prerequisites/Corequisites: Advanced Placement (AP) High School Biology with a score of 3-4 or Bio 10 with a grade of "C" or better and Chem 1A or equivalent.
Recommended: Course Eligibility for ENGL C1000 (or ENGL 1A)
Limits on Enrollment:
Transfer Credit: CSU;UC. (CAN BIOL4)(BIO 2B+BIO 2A+BIO 1.3=BIOL SEQ A)
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	C	Natural Sciences	Spring 1982	
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B2	Life Science	Fall 1981	
	B3	Laboratory Activity		
IGETC:	**Transfer Area**		Effective:	Inactive:
	5B	Biological Sciences	Fall 1981	
	5C	Fulfills Lab Requirement		

CSU Transfer:	Transferable	Effective:	Spring 1982	Inactive:
UC Transfer:	Transferable	Effective:	Spring 1982	Inactive:

CID:
CID Descriptor: BIOL 150 Zoology / Animal Diversity and Evolution
SRJC Equivalent Course(s): BIO2.2

Certificate/Major Applicable:
Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:
The students will:
1. Describe the basic structures and functions of the major biological molecules.
2. Describe and list basic cell structure and function.
3. Relate the physiological adaptation of selected species to the physical conditions of the natural habitats in which they evolved.
4. Explain basic physiological processes of animals such as thermoregulation, metabolism, circulation, gas exchange, osmoregulation, chemical coordination and nervous integration, and how these processes illustrate homeostasis.
5. Memorize the system of classification of organism and be able to classify a selected number of animals.
6. Describe the basic anatomical systems of animals and distinguish between the complimentarity of these structures and their physiological and behavioral functions.
7. Identify the responses of animals to internal and external stimuli from the levels of neurons to social behavior.
8. Relate animal behavior to physiology and ecology.
9. Recognize patterns of animal behavior and how these patterns relate

to natural conditions in which they evolved.
10. Define the basic steps of the scientific method and apply these methods in several experimental laboratory exercises.
11. Describe and explain the basic processes and patterns of inheritance at the chromosomal level.
12. Describe and explain patterns and processes of population genetics.
13. Calculate gene frequencies in populations.
14. Propose hypothesis based on initial observations and make statistical analysis of data.
15. Calculate the confidence interval for the true mean of an entire population based on data from a single sample.
16. Compare the means of two samples of data gathered in laboratory experiments by applying statistical methods.
17. Describe the evolutionary links between major taxonomic groups and relate these links to evolutionary history and processes.
18. Define the basic principles of evolutionary theory and be able to apply them to diversity and evolution of all life forms.
19. Describe the principles and steps of respiration and energetics and apply them to animal metabolism and physiological adaptations.
20. Define the concept of homeostasis and relate it to physiological regulations.
21. Write lab reports in formal scientific paper format using proper English, compositions, grammar and punctuation.

Topics and Scope:

LECTURE MATERIAL:
1. Scientific methods.
2. Basic principles of evolution and adaptation.
3. Levels of biological organization.
4. Reproduction and development of animals.
5. Basic principles of biochemistry and energetics.
6. Animal architecture and design.
7. Membranes and their role in osmoregulation, neural and chemical coordination.
8. Animal diversity, phylogeny and strategies of adaptations.
9. Circulation, respiration, excretion.
10. Metabolism, thermoregulation and energetics.
11. Physiological ecology of animals.
12. Classification and systematics.
13. Locomotion, protection and support.
14. Neural and endocrine control/regulation.
15. Diving, swimming and flying adaptation.
16. Animal nervous systems: function and structure.
17. Describe the major conceptional relationships between mendelian genetics as they are applied to populations, their genetic structure and evolution.
18. Mutation and recombination.
19. The use of biostatistics in analyses of data.
20. Speciation and adaptive radiation/macroevolution.

LABORATORY MATERIAL:
1. Introduction to microscopy.

2. Cellular structure and organization.
3. Animal taxonomy and systematics.
4. Diversity and phylogeny of invertebrates.
5. Diversity and phylogeny of vertebrates.
6. Reproduction and development.
7. Diving and swimming adaptation.
8. Flight.
9. Functional morphology and locomotion.
10. Thermoregulation.
11. Osmoregulation.
12. Acclimation.
13. Behavior.

Assignment:

1. Laboratory exercises and reports.
2. Specific reading and study assignments.
3. Completion of study questions and problems.
4. Reading assignments in the text and laboratory manual.
5. Population genetics problem solving.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, Lab reports, Essay exams	Writing 30 - 40%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Field work, Lab reports, Quizzes, Exams, STATISTICAL ANALYSES/GRAPHING OF DATA	Problem solving 20 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances, Field work, LAB TECHNIQUES/MICROSCOPE/DISSECTIONS	Skill Demonstrations 5 - 10%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, Matching items, Completion, LAB PRACTICALS	Exams 5 - 40%

Other: Includes any assessment tools that do not logically fit into the above categories.

ACTIVE PARTICIPATION ON FIELD TRIPS	Other Category 5 - 10%

Representative Textbooks and Materials:
INTEGRATIVE PRINCIPLES OF ZOOLOGY; 10th Edition; by C.P. Hickman et.al., 1997; William C. Brown, Publisher
BIOLOGY; 5th Edition; by Neil Campbell, 1997; Benjamin-Cummings, Publisher
A HANDBOOK OF BIOLOGICAL INVESTIGATION; by Ambrose and Ambrose, 1987; Hunter Textbooks, Publisher