

BIO 2.2 Course Outline as of Fall 2009

CATALOG INFORMATION

Dept and Nbr: BIO 2.2

Title: FUND BIO:EVO, GENET, ZOO

Full Title: Fundamentals of Biology (Evolution, Genetics, and Zoology)

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 2A

Catalog Description:
Course covers the methods of science, principles of evolution, Mendelian and chromosomal genetics, and the phylogeny of animals with emphasis on development, morphology, physiology and behavior. Field trips taken. Intended for students majoring in biological sciences, pre-medical or related pre-professional programs. (Formerly BIO 1.2, BIO 2A)

Prerequisites/Corequisites:

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Course covers the principles of methods of science, evolution, Mendelian and chromosomal genetics, and the phylogeny of animals with emphasis on development, morphology, physiology and behavior. Field trips taken. Intended for students majoring in biological sciences, pre-medical or related pre-professional programs. (Grade Only)
Prerequisites/Corequisites:

Recommended:
 Limits on Enrollment:
 Transfer Credit: CSU;UC.
 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:
 Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:

Upon completion of the course, students will be able to:

1. Explain the principles of heredity, emphasizing Mendelian and non-Mendelian genetics, the chromosomal basis of inheritance, and probability.
2. Define the basic principles of evolutionary theory and be able to apply them to diversity and evolution of all life forms.
3. Integrate the concepts of genetics with the processes of evolution and phylogeny.
4. Describe and explain patterns and processes of population evolution.
5. Memorize the system of classification for major groups of animals and be able to classify a selected number of animals.
6. Describe the evolutionary links between major taxonomic groups and relate these links to evolutionary history and processes.
7. Describe the basic anatomical systems of animals and distinguish between the complementarity of these structures and their physiological and behavioral functions.
8. Explain basic physiological processes of animals such as thermoregulation, metabolism, circulation, gas exchange, osmoregulation, chemical coordination and nervous integration.
9. Relate animal behavior to physiology and ecology.

10. Define the basic steps of the scientific method and apply these methods in experimental laboratory exercises, generating lab reports in formal scientific paper format.

Topics and Scope:

I. Introduction

- A. Levels of biological organization
- B. Scientific method
- C. The use of biostatistics in analysis of data

II. Post- Mendelian Genetics

- A. Partial dominance, multiple alleles, sex linkage
- B. Relationship of genotype and phenotype
- C. Effects of environment on genetic expression

III. Evolution

- A. Population evolution; Hardy-Weinberg Equilibrium
- B. Evidence for Evolution
- C. Mechanisms of evolution
- D. Biological and other species concepts
- E. Macroevolution
 - 1. speciation
 - 2. reproductive isolating mechanisms
 - 3. adaptive radiation

IV. Animal diversity

- A. Phylogeny and adaptation
- B. Taxonomy, classification, systematics
- C. Diversity of protozoa

V. Animal anatomy and physiology

- A. Animal architecture and design
- B. Membranes and their physiological roles
- C. Physiological ecology of animals
- D. Anatomy and physiology
 - 1. circulation, respiration, excretion, digestion
 - 2. metabolism, thermoregulation, and energetics
 - 3. locomotion, protection and support
 - 4. neural and endocrine control, regulation
 - 5. diving, swimming, and flying adaptations
 - 6. reproduction and development of animals

VI. Animal Behavior

VII. Laboratory Exercises

- A. Animal taxonomy and systematics
- B. Diversity and phylogeny of invertebrates
- C. Diversity and phylogeny of vertebrates
- D. Reproduction and development
- E. Functional morphology and locomotion
- F. Thermoregulation, osmoregulation or acclimation
- G. Behavior
- H. Field biology

Assignment:

1. Weekly reading in text and other sources, 50-80 pages per week.

2. Lab reports: may include calculation, graphing and data analysis, 3-5/semester.
3. Field notes
4. Solving population genetics and Hardy-Weinberg equilibrium problems
5. Formal assessment: 3 to 4 midterm exams and a comprehensive final exam including objective and essay questions, 3 to 4 lab practical examinations, 3-4 quizzes.

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.

Field notes

Writing
10 - 30%

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

Lab reports, genetics and Hardy-Weinberg problems

Problem solving
10 - 30%

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

None

Skill Demonstrations
0 - 0%

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

Multiple choice, completion, essay questions

Exams
40 - 80%

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

Active participation in class, including field trips

Other Category
0 - 10%

Representative Textbooks and Materials:

Biology, Campbell and Reece, 8th edition, 2008

Integrative Principles of Zoology, C.P. Hickman et al., 14th edition, 2005

Animal Diversity, C.P. Hickman et al, 5th edition, 2009