BIO 2B Course Outline as of Spring 2001

CATALOG INFORMATION

Dept and Nbr: BIO 2B 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	8	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 1.1

Catalog Description:
Intended for major in biological sciences, pre-medical or related pre-professional programs. Phylogeny of bacteria, protists, fungi and plants with emphasis on the development, morphology and physiology of higher plants. Mendelian and chromosomal genetics; principles of ecology; methods of science and biostatistics. Field trips taken. (Formerly Biology 1.1)

Prerequisites/Corequisites:
Course Completion of BIO 2.2 (or BIO 2A or BIO 1.2 or BIO 1B)

Recommended Preparation:
Course Eligibility for ENGL 1A

Limits on Enrollment:

Schedule of Classes Information:
Description: Intended for majors in bio sciences, pre-med or related pre-professional programs. Phylogeny of bacteria, protists, fungi & plants with emphasis on the development, morphology & physiology of higher plants. Mendelian genetics; chromosomal genetics; principles of ecology methods of science & biostatistics. Field trips taken. Course fee required. (Grade Only)
Prerequisites/Corequisites: Course Completion of BIO 2.2 (or BIO 2A or BIO 1.2 or BIO 1B)

Recommended: Course Eligibility for ENGL 1A
Limits on Enrollment:
Transfer Credit: CSU;UC. (CAN BIOL6)(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	Fall 1981	
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:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:
CID Descriptor: BIOL 155 Botany / Plant Diversity and Ecology
SRJC Equivalent Course(s): BIO2.3

Certificate/Major Applicable:
Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:
The students will be able to:
1. Describe the basic functions and parts of the light microscope, and apply this knowledge by practicing microscope techniques in many laboratory exercises.
2. Explain the principles of biosystematics, emphasizing the phylogenetic basis for modern systems of classification.
3. Outline the classification system for major groups within the bacteria, protists, fungi and plants, and be able to correctly identify and classify selected example organisms with emphasis on plants.
4. Identify and explain the functions of the basic structures of organisms (emphasis on plants) and describe the complementary relationships between these structures and their functions.
5. Describe the physiological functions of plants (including water relations, nutrition, transpiration and photosynthesis), especially in relationship to the natural habitats in which plants have evolved.
6. Explain the phylogenetic relationships between major taxonomic groups and relate these links to evolutionary history.
7. Explain the processes of life histories and development in plants from the embryo to the mature adult, including the influences of hormones and environmental factors.

8. Explain and diagram the steps of cell reproduction, including mitosis and meiosis.
9. Explain the principles of heredity, emphasizing Mendelian and non-Mendelian genetics, the chromosomal basis of inheritance, and the application to human genetics.
10. Apply the laws of probability in solving genetic problems.
11. Integrate the concepts of genetics with the processes of evolution and phylogeny.
12. Explain the principles of ecology, emphasizing populations, communities, and ecosystems.
13. Explain the basic steps of the scientific method and apply this method in laboratory exercises.
14. In the laboratory, (1) propose hypotheses based on initial observations, (2) test hypotheses by gathering additional data and (3) analyze data using statistical methods.
15. Prepare laboratory reports that use the format of scientific papers, and integrate discussion and statistical analysis of results.

Topics and Scope:

1. Principles of Biosystematics
2. Theories of the origin of life
3. Structure of the Prokaryotic Cell
4. Kingdom Monera (Archaebacteria and Eubacteria)
5. Structure of the Eukaryotic Cell
6. Review of Cellular Reproduction: Mitosis and Meiosis
7. Multicellularity; Alternation of Generations
8. Kingdom Protista (Slime Molds, Green, Brown and Red Algae)
9. Kingdom Fungi including Lichens and Mycorrhizae
10. Kingdom Plantae: Origin and Development
11. Bryophytes and seedless Vascular Plants
12. Evolution of Seed Plants
13. Gymnosperms (morphology and life cycles)
14. Angiosperms (morphology)
15. Seed plant anatomy (stems, roots, and leaves, primary and secondary growth)
16. Soils and Mineral Nutrition
17. Water in living systems (diffusion, osmosis, water potential)
18. Active and Passive Transport in plants
19. Transport of Water and Solutes in Plants
20. Plant Growth and Development
21. Photosynthesis (C3, C4 and CAM)
22. Chromosome Structure
23. Mendelian Genetics (Monohybrid and Dihybrid Crosses)
24. Non-Mendelian Genetics (multiple alleles, gene interaction, sex linkage)
25. Human Genetics
26. Chromosomal Basis of Inheritance (Recombination, Crossover, Linkage, and Mapping
27. Dynamics of biological systems
28. Population biology (structure and demographics)

29. Community dynamics (structure, species interaction and succession)
30. Ecosystem (energy flow, trophic structure, water and nutrient cycling)
31. Statistical Analysis of Data (chi square test, etc.)
32. Probability Theory

Assignment:

1. Read textbook and other assigned readings.
2. Genetics problems sets.
3. Laboratory reports and drawings.

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.

Reading reports, Lab reports, Essay exams, Field Reports	Writing 30 - 40%

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

Homework problems, Field work, Lab reports, Exams	Problem solving 20 - 30%

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

Class performances, Field work, Performance exams, Use of laboratory equipment	Skill Demonstrations 5 - 10%

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

Multiple choice, Matching items, Completion, Lab Practicals	Exams 30 - 40%

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

Active participation in class, including field trips	Other Category 5 - 10%

Representative Textbooks and Materials:
BIOLOGY, 4th ed., by Neil Campbell, Benjamin-Cummings, 1996.
HANDBOOK OF BIOLOGICAL INVESTIGATION, 4th ed., by Ambrose and Ambrose, Hunter.