



COURSE OUTLINE : BIOL 122

D Credit – Degree Applicable

COURSE ID 005081

Cyclical Review: May 2019

Revision: October 2021

COURSE DISCIPLINE : BIOL

COURSE NUMBER : 122

COURSE TITLE (FULL) : Introduction to Biology

COURSE TITLE (SHORT) : Introduction to Biology

ACADEMIC SENATE DISCIPLINE: Biological Science

CATALOG DESCRIPTION

BIOL 122 is a survey course in the biological sciences designed to meet the laboratory science or life science requirement for most general education programs. BIOL 122 covers the scientific method, molecular and cellular organization and function, genetics, and plant/animal anatomy and physiology. This course also covers evolution, a survey of biodiversity, ecology, and the impact of humans on the environment.

Total Lecture Units:3.00

Total Laboratory Units: 1.00

Total Course Units: 4.00

Total Lecture Hours:54.00

Total Laboratory Hours: 54.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 108.00

Total Out-of-Class Hours: 108.00

Recommended Preparation: ENGL 100 or ESL 151, or equivalent.



ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1	ENGL	100	Writing Workshop	read, analyze, and evaluate contemporary articles and stories for the comprehension of difficult content and the identification of main ideas and (topic-based) evidence;	Yes
2	ENGL	100	Writing Workshop	write compositions (e.g., summaries and argumentative essays) that are easy to read and follow, though some errors in grammar, mechanics, spelling, or diction may exist;	Yes
3	ESL	151	Reading And Composition V	read and critically analyze various academic readings;	Yes
4	ESL	151	Reading And Composition V	summarize readings;	Yes

EXIT STANDARDS

- 1 Describe the structure of atoms, the properties of water and structure and function of biological macromolecules;
- 2 describe the flow of information from DNA to protein;
- 3 describe the mechanisms of evolution including natural selection;
- 4 describe basic ecological principles and the impact of humans on the environment;
- 5 identify the defining characteristics of major groups of organisms;
- 6 compare prokaryotic and eukaryotic cells, and describe the structure and function of eukaryotic organelles;
- 7 describe the principles of inheritance and solve basic Mendelian genetics problems;
- 8 describe basic principles of mammalian physiology.

STUDENT LEARNING OUTCOMES

- 1 explain the basic principles of population and community ecology and describe the effects of human activities on the biosphere
- 2 explain the major mechanisms of evolution and identify the defining characteristics of major groups of organisms
- 3 define a gene, demonstrate the flow of information from DNA to protein, and solve basic Mendelian genetics problems;
- 4 describe eukaryotic cell structure and cell division (mitosis and meiosis).



COURSE CONTENT WITH INSTRUCTIONAL HOURS

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	Description	Lecture	Lab	Total Hours
1	Scientific Method <ul style="list-style-type: none"> • Metric system • Hypothesis and theory • Biological organization 	3	3	6
2	Basic Chemistry <ul style="list-style-type: none"> • Atoms and bonding • Properties of water • Macromolecules • Carbohydrates • Lipids • Proteins • Nucleic acids 	9	3	12
3	Cell Structure and Function <ul style="list-style-type: none"> • Prokaryote vs. eukaryote • Plant vs. animal • Cellular organelles • Diffusion and osmosis 	3	7	10
4	Energy <ul style="list-style-type: none"> • Kinetic vs. potential • Photosynthesis • Cellular respiration 	3	3	6
5	Cell Division <ul style="list-style-type: none"> • DNA replication • Mitosis • Meiosis • Cancer • Non-disjunction 	4	3	7
6	Mendelian Genetics <ul style="list-style-type: none"> • Mendel's pea plants • Incomplete and co-dominance • Sex-linked traits • Dihybrid cross and linked genes 	5	3	8



7	<p>DNA and Biotechnology</p> <ul style="list-style-type: none"> • Transcription • Translation • Biotechnology • Gene therapy • Genetically modified crops • Forensic applications 	4	3	7
8	<p>Evolution</p> <ul style="list-style-type: none"> • Historical perspective • Mechanisms • Natural selection • Genetic drift • Gene flow • Mutation • Non-random mating • Evidence • Fossil record • Biogeography • Long-term experiments 	10	3	13
9	<p>Origin of Life</p> <ul style="list-style-type: none"> • Big bang and early earth • RNA world and first cells • Origin of eukaryotes and Cambrian explosion • Speciation • Vertebrate origins 	5	0	5
10	<p>Ecology</p> <ul style="list-style-type: none"> • Populations • Communities • Ecosystems • Human impact on the biosphere 	5	8	13
11	<p>Biodiversity survey</p> <ul style="list-style-type: none"> • Microorganisms • Plants • Animals • Focus on mammals (LA zoo) 	0	12	12



12	Mammalian physiology	3	6	9
	<ul style="list-style-type: none"> • Sensory physiology • Digestive system • Circulatory and respiratory systems • Reproductive system 			
				108

OUT OF CLASS ASSIGNMENTS

- 1 reading quizzes;
- 2 completion of laboratory reports;
- 3 homework (e.g., practice Mendelian genetics problems).

METHODS OF EVALUATION

- 1 laboratory quizzes;
- 2 lecture exams.

METHODS OF INSTRUCTION

- Lecture
- Laboratory
- Studio
- Discussion
- Multimedia
- Tutorial
- Independent Study
- Collaboratory Learning
- Demonstration
- Field Activities (Trips)
- Guest Speakers
- Presentations

TEXTBOOKS

Title	Type	Publisher	Edition	Medium	Author	ISBN	Date
What is Life? A Guide to Biology	Required	New York, NY: W.H. Freeman	4	Print	Phelan, J.	978-1319065454	2018
Campbell Essential Biology	Required	Pearson	7	Print	Simon, Eric	978-0134765037	2018