

BIOL126 : Field And Laboratory Investigations In Marine Biology

General Information

Author:	<ul style="list-style-type: none">Karoline Rostamiani
Course Code (CB01) :	BIOL126
Course Title (CB02) :	Field And Laboratory Investigations In Marine Biology
Department:	BIOL
Proposal Start:	Fall 2024
TOP Code (CB03) :	(0401.00) Biology, General
CIP Code:	(26.0101) Biology/Biological Sciences, General.
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	Yes
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000335349
Curriculum Committee Approval Date:	11/08/2023
Board of Trustees Approval Date:	12/19/2023
Last Cyclical Review Date:	11/08/2023
Course Description and Course Note:	BIOL 126 is an introductory science laboratory offering a general survey of the diversity of life in the marine environment and the ecology of some of its major ecosystems. This course covers aspects of microscopy, pH, cell respiration, photosynthesis, biodiversity, ecology, and evolution. The laboratory exercises utilize the comparative method in order to study the anatomy, physiology, and evolution of some of the major phyla of marine organisms. This course requires the participation in three or more field trips, which introduce the student to research methods, marine biodiversity, evolution, and the ecology of marine ecosystems. Field trips total a minimum of 9 hours. Note: A material/lab fee may be required for this course.
Justification:	Mandatory Revision
Academic Career:	<ul style="list-style-type: none">Credit
Author:	<ul style="list-style-type: none">Karoline Rostamiani

Academic Senate Discipline

Primary Discipline:	<ul style="list-style-type: none">Ecology
Alternate Discipline:	<ul style="list-style-type: none">Biological Sciences
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

Transferability & Gen. Ed. Options

General Education Status (CB25)

Not Applicable

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

IGETC Area	Area	Status	Approval Date	Comparable Course
5C-Science Laboratory	Science Laboratory	Approved	09/09/1991	No Comparable Course defined.

CSU GE-Breadth Area	Area	Status	Approval Date	Comparable Course
B3-Laboratory Activity	Laboratory Activity	Approved	No value	No Comparable Course defined.

Units and Hours

Summary

Minimum Credit Units (CB07)	1
Maximum Credit Units (CB06)	1
Total Course In-Class (Contact) Hours	54
Total Course Out-of-Class Hours	0
Total Student Learning Hours	54

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Funding Agency Category (CB23)

Credit Course.

Not Applicable.

Cooperative Work Experience

Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	0	0
Laboratory Hours	3	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks) 18

Hours per unit divisor 54

Course In-Class (Contact) Hours

Lecture 0

Laboratory 54

Studio 0

Total 54

Course Out-of-Class Hours

Lecture 0

Laboratory 0

Studio 0

Total 0

Time Commitment Notes for Students

Field trips total a minimum of 9 hours.

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Prerequisite

BIOL125 - Marine Biology (in-development)

Objectives

- Explain concepts in general biology using examples from the marine environment.
- Identify the basic geological, chemical, and physical characteristics of the marine environment.
- Describe some of the potential adaptations that allow organisms to survive and reproduce in the marine environment.
- Identify the major phylogenetic groups of marine organisms and describe some of the evolutionary trends within them.
- Compare and contrast the major marine ecosystems.
- Identify the problems caused by human impact on the marine environment and its resources.

OR

Co-Requisite

BIOL125 - Marine Biology (in-development)

Entry Standards

Entry Standards

No value

Specifications

Methods of Instruction

Methods of Instruction Discussion

Methods of Instruction Lecture

Methods of Instruction Laboratory

Methods of Instruction Field Activities (Trips)

Methods of Instruction Multimedia

Out of Class Assignments

N/A

Methods of Evaluation

Exam/Quiz/Test

Activity (answering journal prompt, group activity)

Exam/Quiz/Test

Rationale

Midterm examinations, each consisting of multiple choice, true/false, diagrams, short answers, and analytical questions

Completion of laboratory and field trip handouts

Active participation in laboratory activities, field trips, and discussions

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
--------	-------	-----------	------	------

No Value	No Value	No Value	No Value	No Value
----------	----------	----------	----------	----------

Other Instructional Materials (i.e. OER, handouts)

Description	Biol 126. Laboratory Exercises in Marine Biology
Author	Gago, F. J.
Citation	No value
Online Resource(s)	

Materials Fee

Lab fee.

Learning Outcomes and Objectives

Course Objectives

Utilize a microscope and measure cell sizes.

Prepare a culture of marine bacteria and stain samples for observation.

Explain the relation between pH, photosynthesis, and cell respiration.

Identify photosynthetic pigments using chromatography and spectrophotometry.

Identify the major groups of phytoplankton and macroalgae, their anatomical and physiological characteristics.

Identify the main anatomical and physiological characteristics of some of the major phyla of marine animals.

Describe some of the major concepts of marine biodiversity, evolution, and ecology.

SLOs

Identify and compare the defining anatomical and physiological characteristics of dominant phyla of marine organisms.

Expected Outcome Performance: 70.0

<i>ILOs</i> Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
--------------------------	--

	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
--	--

<i>BIOL</i> Core PLOs	Prepare for a career in Biology by completing the AS degree in Biological Science (or AS-T in Biology) and/or being accepted for transfer to a 4-year university program in biology or a related field.
--------------------------	---

<i>ILOs</i>	apply reasoning to evaluate hypotheses and theories
General	
Education	examine causality or associations between or among variables of the natural world

Identify the main concepts in marine biodiversity, evolution, and ecology.

Expected Outcome Performance: 70.0

<i>ILOs</i>	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
Core ILOs	

<i>BIOL</i>	Prepare for a career in Biology by completing the AS degree in Biological Science (or AS-T in Biology) and/or being accepted for transfer to a 4-year university program in biology or a related field.
Core PLOs	

<i>ILOs</i>	apply reasoning to evaluate hypotheses and theories
General	
Education	examine causality or associations between or among variables of the natural world

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

No value

Laboratory/Studio Content

Microscopy, Prokaryotes, and Plankton (7 hours)

- Parts and functions of a compound microscope
- Measurement of cell sizes under the microscope
- Preparation of cultures of marine bacteria
- The Gram stain and preparation of slides of marine bacteria
- Identification of the major morphological types of marine bacteria
- Identification of major groups of unicellular eukaryotic marine plankton

pH, Photosynthesis, and Cell Respiration (4 hours)

- pH scale and using pH meters
- Buffering capacity of seawater
- The relationship between photosynthesis, cell respiration, and pH
- The effect of pH on marine organisms
- Global warming, CO₂, and the pH of seawater

Phytoplankton, Macroalgae, and Photosynthesis (4 hours)

- Anatomy and physiology of the major groups of marine phytoplankton and macroalgae

- Separation and identification of photosynthetic pigments using paper chromatography
- Identification of photosynthetic pigments using spectrophotometry

Mollusca (4 hours)

- Identification of the major groups of marine molluscs
- Anatomy, physiology, and evolution of molluscs
- Squid dissection

Arthropoda (4 hours)

- Identification of the major groups of marine arthropods
- Anatomy, physiology, and evolution of arthropods
- Crab dissection

Echinodermata (4 hours)

- Identification of the major groups of marine echinoderms
- Anatomy, physiology, and evolution of echinoderms
- Sea star dissection
- Fertilization of sea urchin eggs

Arthropoda (4 hours)

- Identification of the major groups of marine arthropods
- Anatomy, physiology, and evolution of arthropods
- Crab dissection

Invertebrate Chordates, Cyclostomata, and Chondrichthyes (4 hours)

- Identification of the major groups of marine invertebrate chordates, cyclostomes, and chondrichthyes
- Anatomy, physiology, and evolution of invertebrate chordates, cyclostomes, and chondrichthyes
- Shark dissection

“Osteichthyes” (4 hours)

- Identification of the major groups of marine “osteichthyes”
- Anatomy, physiology, and evolution of “osteichthyes”
- Mackerel dissection

Field trips from the following choices to complement topics in biodiversity, ecology, evolution, and marine mammals (9 hours)

- Natural ecosystems: rocky and soft intertidal, sandy beach, open water, coral reefs, mangroves, and estuaries
- Natural History Museums
- Aquariums

Total hours: 54