

BIOL-240: GENERAL ZOOLOGY

Effective Term

Fall 2026

CC Approval

12/05/2025

AS Approval

12/11/2025

BOT Approval

12/18/2025

COCI Approval

02/26/2026

SECTION A - Course Data Elements

CB04 Credit Status

Credit - Degree Applicable

Discipline

Minimum Qualifications	And/Or
Biological Sciences (Master's Degree)	

Subject Code

BIOL - Biology

Course Number

240

Department

Biology

Division

Science and Engineering (SE)

Full Course Title

General Zoology

Short Title

General Zoology

CB03 TOP Code

0407.00 - Zoology, General

CB08 Basic Skills Status

NBS - Not Basic Skills

CB09 SAM Code

E - Non-Occupational

Rationale

Update DEI.

SECTION B - Course Description

Catalog Course Description

An integrated course in zoology and organismal biology, emphasizing the anatomy, physiology, development, diversity, and evolutionary relationships of animals. Major topics include comparative study of major animal phyla, principles of evolution, genetics of organisms and populations, mechanisms of animal development, and structure-function relationships in animals. Intended for biology majors.

SECTION C - Conditions on Enrollment

Open Entry/Open Exit

No

Repeatability

Not Repeatable

Grading Options

Letter Grade or Pass/No Pass

Allow Audit

Yes

Requisites

Prerequisite(s)

Completion of BIOL-120, CHEM-120 and a course taught at or above the level of intermediate algebra with a minimum grade of C or appropriate placement.

Requisite Justification

Requisite Description

Course in a Sequence

Subject

BIOL

Course

120

Level of Scrutiny

Content Review

Upon entering this course, students should be able to:

1. Cell Theory
2. Membrane transport
3. Mendelian genetics
4. Metabolism
5. Biological macromolecule structure
6. Protein synthesis

Requisite Description

Course in a Sequence

Subject

CHEM

Course

120

Level of Scrutiny

Content Review

Upon entering this course, students should be able to:

1. Cell Theory
2. Membrane transport
3. Mendelian genetics
4. Metabolism
5. Biological macromolecule structure
6. Protein synthesis

Requisite Description

Non-course Requisite

Level of Scrutiny

Communication/Computational Skill Required for Transfer

SECTION D - Course Standards**Is this course variable unit?**

No

Units

5.00000

Lecture Hours

54

Lab Hours

108

Outside of Class Hours

108

Total Contact Hours

162

Total Student Hours

270

Distance Education Approval**Is this course offered through Distance Education?**

Yes

Online Delivery Methods

DE Modalities	Permanent or Emergency Only?
Entirely Online	Permanent
Hybrid	Permanent
Online with Proctored Exams	Permanent

SECTION E - Course Content**Student Learning Outcomes**

1. Characterize the major animal phyla and compare their basic anatomy.
2. Articulate the principles of Darwinian evolutionary theory.
3. Relate structure to function in the vertebrate organ systems.

Course Objectives**Upon satisfactory completion of the course, students will be able to:**

1. Trace the evolutionary history of animal life from the Cambrian Period to the present and correlate major milestones in the evolution of vertebrate animals with the geologic time scale.
2. Describe important aspects of animal body organization including symmetry, germ layers, body cavities, segmentation, appendages, and organ systems in the major animal phyla.
3. Articulate the principles of Darwinian evolutionary theory and present lines of evidence for macroevolution and microevolution.

4. Describe basic methods of phylogenetic analysis and outline current understanding of phylogeny of major animal groups.
5. Compare the anatomy of the chordate classes and identify homologous structures in different classes and different organ systems.
6. Distinguish various embryonic stages of the sea star and frog and compare these to the early embryos of birds and mammals.
7. Discuss the regulation of animal development at the molecular, cellular, and higher levels of organization.
8. Demonstrate the relationship between biological structure and function using specific examples from the vertebrate organ systems.
9. Summarize energy relations of animals from the cellular to the organismal level.
10. Describe how information is processed and transmitted in the vertebrate nervous system.
11. Distinguish between innate and learned behaviors and describe examples of each in animal communication.

Course Content

1. Lecture Topics
 - a. Overview of animal diversity and evolutionary history
 - i. Geologic time scale and animal evolution
 - ii. Mass extinctions
 - iii. Cenozoic radiation of mammals, birds and insects
 - b. Animal body plans
 - i. Levels of biological organization
 - ii. Radial and bilateral symmetry
 - iii. Body cavities
 - c. Evolution
 - i. Evolution by natural selection
 - ii. The fossil record
 - iii. Biogeography
 - iv. Homology
 - v. Experimental evidence of evolution
 - vi. Speciation
 - d. Phylogeny
 - i. Major animal clades
 - ii. Phylogenetic analysis
 - e. Genetics of organisms and populations
 - i. Mendelian genetics
 - ii. Chromosomal genetics, linkage and recombination
 - iii. Population genetics
 - f. Animal development
 - i. Early embryonic stages and processes
 - ii. Comparative embryology of a sea star, frog, bird, and mammal
 - iii. Regulation of development: induction and regulatory genes
 - iv. Pattern formation in *Drosophila* and vertebrate limb development
 - g. Chordate evolution and morphology
 - i. Chordate characteristics
 - ii. Early vertebrates
 - iii. Origin of tetrapods
 - iv. Evolution of amniotes and reptilian diversity
 - v. Evolution and functional morphology of mammals
 - h. Animal form and function
 - i. Functional requirements and exchange processes
 - ii. Animal tissues
 - iii. Homeostasis
 - iv. Thermal and energy relations of animals
 - i. Physiology of vertebrate organ systems
 - i. Skeletal system
 - ii. Muscular system
 - iii. Digestive system
 - iv. Circulatory systems

- v. Respiratory systems
- vi. Excretory systems and osmoregulation
- j. Control and integration
 - i. Neurons and neural signaling
 - ii. Vertebrate nervous system
 - iii. Endocrine signaling
- k. Introduction to animal behavior
 - i. Ethology
 - ii. Innate and learned behaviors
 - iii. Animal communication
- 2. Laboratory Topics and Activities
 - a. Animal classification and phylogeny
 - i. Taxonomic hierarchy and biological nomenclature
 - ii. Phylogenetic classification
 - 1. construct cladograms of selected invertebrate and vertebrate animals
 - b. Detailed study of major animal phyla
 - i. Porifera and Cnidaria
 - 1. study representative specimens of sponges and cnidarians
 - 2. diagram the canal system of a syconoid sponge
 - 3. diagram the life cycle stages of a hydrozoan cnidarian
 - 4. collect acontia from a live anemone and observe firing of nematocysts
 - ii. Platyhelminthes, Nematoda and Annelida
 - 1. characterize basic anatomy of each phylum and relate form to function
 - 2. diagram life cycles of a liver fluke and a tapeworm
 - 3. earthworm dissection
 - iii. Mollusca
 - 1. study live and preserved mollusks and mollusk shells
 - 2. compare functional anatomy of bivalve, gastropod, and cephalopod mollusks
 - 3. squid dissection
 - iv. Arthropoda
 - 1. - identify important features of the arthropod body plan -
 - 2. study and characterize representative specimens of arachnids, crustaceans, myriapods and insects
 - 3. crayfish dissection
 - 4. identify major insect orders and compare external morphology
 - 5. discuss life cycles, adaptations, and ecological interactions of various insects
 - v. Echinodermata
 - 1. study preserved and live echinoderms
 - 2. diagram the water vascular system of a sea star
 - 3. compare digestive system structure of a sea star and a sea urchin
 - vi. Chordata
 - 1. identify key chordate characteristics on slides of invertebrate chordates
 - 2. diagram phylogeny of the vertebrate classes and compare representative specimens
 - 3. compare anatomy of a shark and a bony fish
 - 4. identify diverse types of reptiles, birds and mammals
 - 5. describe morphological adaptations for swimming, flying and terrestrial locomotion in different vertebrate classes
 - vii. Field Trip to the Coast
 - 1. observe intertidal and marine animals in a protected harbor and along the exposed coastline
 - 2. characterize zonation patterns of intertidal animals
 - 3. discuss specific adaptations for life in the intertidal zone
 - c. Animal development
 - i. Embryology of the sea star
 - 1. identify stages of early sea star development on slides
 - ii. Embryology of the frog
 - 1. identify stages and structures of the frog embryo
 - iii. Development of the vertebrate body plan
 - 1. relate embryonic structures in the frog and chick embryo to the vertebrate body plan
 - d. Vertebrate Form and Function

- i. Vertebrate skeleton
 1. identify major bones on mounted and disarticulated skeletons
 2. recognize skeletal homology in diverse mammal skeletons
 3. compare skull morphology and dentition in herbivorous, carnivorous and omnivorous mammals
- ii. Functional anatomy of mammals: Fetal pig dissection
 1. Muscular system
 2. Digestive and respiratory systems
 3. Circulatory systems
 4. Urogenital systems
- iii. Histology
 1. characterize the four basic tissue types
 2. identify subtypes of epithelial tissues and connective tissues on slides
 3. compare structure of the three types of muscular tissue
 4. identify major organs and tissues on slides from the digestive, respiratory and urinary systems

Methods of Instruction

Methods of Instruction

Types	Examples of learning activities
Discussion	Instructor and student-led discussions of reading assignments.
Field Trips	Class field trip to Bodega Harbor and Bodega Marine Laboratory
Lab	Observation and inquiry-based study of animal diversity, embryology, functional anatomy and physiology
Lecture	Spoken lectures with visual media, diagram handouts, and interactive question and discussion

Online Adaptation

Types	Examples of learning activities
Activity	
Directed Study	
Discussion	
Group Work	
Individualized Instruction	
Journal	
Lecture	

Instructor-Initiated Online Contact Types

Announcements/Bulletin Boards
 Chat Rooms
 Discussion Boards
 E-mail Communication
 Telephone Conversations
 Video or Teleconferencing

Student-Initiated Online Contact Types

Chat Rooms
 Discussions
 Group Work

Course design is accessible

Yes

Methods of Evaluation

Methods of Evaluation

Types	Examples of classroom assessments
Exams/Tests	Midterm exams (2-3) consist of multiple choice, short answer, and essay questions on material covered in the lectures. Example: Midterm 1 covers animal origins, Darwinian evolution, speciation, and genetics of organisms and populations. Cumulative final exam consists of multiple choice, short answer, and essay questions on material covered over the entire course, with greater emphasis on animal form and function.
Quizzes	Lecture quizzes consist of multiple choice and short answer questions. Lab quizzes cover material assigned in previous labs or procedures for the current lab.
Essays/Papers	1. Short reports on reading assignments and field trip observations. 2. Term report.
Lab Activities	1. Written answers to questions assigned with the laboratory exercises. 2. Practical lab exams (3-4) emphasizing identification of animal specimens, structures and questions on animal form and function. Example: Lab Exam 1 covers identification and anatomy of the phyla Porifera, Cnidaria, Platyhelminthes, Nematoda, Annelida, and Mollusca.

Assignments

Reading Assignments

1. Reading assignments from the textbook and laboratory manual as specified in the course syllabus.
2. Additional reading from scientific journals and excerpts from scientific texts.

Example 1: Read Chapter 22 in Campbell Biology on evolution by natural selection.

Example 2: Read Chapter 3: "Handy Genes" from the book "Your Inner Fish" in preparation for class discussion on the regulation of limb development in vertebrates.

Writing Assignments

1. Term Report
2. Short reports on reading assignments and the field trip.

Example 1: Term report. Write a detailed report on an animal species, taxonomic group, or zoological topic appropriate to the class and approved by the instructor. Include information on the taxonomy, geographic distribution, habitat, life history, and ecological niche of the species, and focus in detail on one or more significant aspects of the species' biology such as functional anatomy, physiological adaptations, behavior, or evolution. The report must cite at least two primary references from the scientific literature in addition to online sources, book chapters and/or review articles, and must use proper citation format.

Example 2: Field trip report. Following the field trip to Bodega Bay, write a two-page report that describes adaptations to the challenges of the intertidal zone, focusing on two species that you observed during the field trip.

Outside-of-Class Assignments

1. Answers to questions assigned for each lab exercise.
2. Lab notebook

Example 1: Lab 4 questions.

1. Describe and compare the functions of the mantle and the mantle cavity in a clam and in a squid.
2. Define cephalization and rank the classes of mollusks studied in the lab from lowest to highest degree of cephalization.
3. Diagram the water flow pattern through the mantle cavity of a marine snail, showing the incurrent and excurrent flows.
4. What structures function to close the valves of a clam shell? What structure opens the valves?
5. Describe how a clam burrows into sand or mud. What specific muscle(s) does it use?
6. Make a table of several species you studied in lab that divides them into the following groups: ciliary-mucoid filter feeders, radular grazers, active predators.

Example 2: Lab notebook. Students submit their lab notebook at the end of the term that includes their lab notes, data, drawings, and answers to questions for each lab. The notebook is assessed for completeness and quality of work.

SECTION F - Textbooks and Instructional Materials

Material Type

Textbook

Author

Urry, L.A., et al

Title

Campbell Biology

Edition/Version

12th

Publisher

Pearson

Year

2020

Material Type

Textbook

Author

Hickman, C.P., et al

Title

Integrated Principles of Zoology

Edition/Version

18th

Publisher

McGraw-Hill

Year

2020

Material Type

Textbook

Author

Hickman, C.P., et al

Title

Laboratory Studies in Integrated Principles of Zoology

Edition/Version

18th

Publisher

McGraw-Hill

Year

2020

SECTION G - Diversity, Equity and Inclusivity

How does your course and/or course outline of record reflect strategies for accommodating and engaging diverse student populations, advancing equitable outcomes, and fostering inclusion for all students?

This course supports diverse student populations through the use of multiple representations of concepts, varied applications, and technology. Strategies may also include collaborative learning, transparent assessment practices, low-cost resources, and opportunities for students to connect course material to their own experiences, fostering equitable outcomes and an inclusive classroom environment.

Course Codes (Admin Only)

CB00 State ID

CCC000085469

CB10 Cooperative Work Experience Status

N - Is Not Part of a Cooperative Work Experience Education Program

CB11 Course Classification Status

Y - Credit Course

CB13 Special Class Status

N - The Course is Not an Approved Special Class

CB23 Funding Agency Category

Y - Not Applicable (Funding Not Used)

CB24 Program Course Status

Program Applicable

Allow Pass/No Pass

Yes

Only Pass/No Pass

No