



COURSE SYLLABUS

BZ 110 Principles of Animal Biology

Instructor Information



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Office Location: Biology 246

Drop-in Hours: Wednesdays 1:30-2:30pm & Thursdays 10-11am. If these times don't work for you and/or you'd like to meet virtually please email me a meeting request and provide 3 - 5 possible meeting times.

Communication Policy: Please email me directly if you have any questions or need assistance. I want to hear from you! But, please do not use Canvas messenger. I will respond to emails within two business days.

Learning Assistant Information

This class has a team of undergraduate Learning Assistants to support students during class and through regular office hours and review sessions. See information on Canvas and the [learning assistant program's website](#).



Prerequisites for Course

This course has no prerequisites.

Course Description

This class reviews the general features (body form, physiology, life history, ecology) and evolutionary relationships of major phyla of animals. It is organized into 3 parts: common life processes, survey of major animal phyla, and animal form and function. Part 1, common life processes, will introduce cell and tissue structure and function, cell division, Mendelian genetics, the genetic basis of evolution and the evolutionary and ecological principles that unify all life. Part 2, survey of animals, will emphasize evolutionary and ecological relationships, aspects of animal organization that unite major animal phyla, and animal adaptations. Part 3, animal form and function, will detail select organ systems in invertebrates and vertebrates.

Please see the course learning objectives section below for additional information for specific learning goals and outcomes.

Textbook / Course Readings

Zoology 12th Edition by Stephen A. Miller and Todd A. Tupper. 2024 McGraw Hill

To increase affordability and accessibility, the textbook and McGraw Hill Connect are provided to all students enrolled in this course through [CSU's Day One Access program](#). If you choose to opt-out of this program, you are responsible for obtaining access to the textbook and McGraw Hill Connect on your own.

Course Materials & Equipment

Your participation and real time communication with other students and the teaching team in class is important for your success. To facilitate this, we will use iClickers in class for activities, questions and participation. You must be present in class and bring a device linked to your iClicker account to participate. Please see the [Student iClicker information page](#) for instructions on how to set-up and use iClicker.

Additional materials including readings, activities, lecture slides, etc. will be posted to Canvas, typically the day before each class.

You will also need to purchase and bring a set of index cards to class.

Morgan Library Services Desk

The Morgan Library Services Desk provides both research (ph. 970-491-1841) and technical (ph. 970-491-7276) support. In addition, you can contact a librarian for assistance at [Ask Us!](#) or find a research guide at [Research Help](#).

Classroom Norms and Expectations

We believe that you are here to do your best and succeed!

Instructional Team:

- Start and end class on time.
- Facilitate your learning to the best of our ability.
- Evaluate your learning with assessments of the material covered in class.
- Communicate in a timely manner (inc. grading).

Classmates:

- Actively engage with each other to work through problems, discussions, and in-class exercises.

All:

- Adhere to the [CSU Principles of Community](#) (**Inclusion, Integrity, Respect, Service, Social Justice**). This includes using [preferred pronouns](#), honoring the value of diverse perspectives and experiences, acting civilly, etc.

You:

- Come to class on time, pay attention, and stay for the whole class.
- Do not engage in other activities during class (*web surfing, social media, playing games, etc.*).
- Make a consistent effort to try to understand the material (*take time to study each week, participate in our class discussions and activities, use the resources provided, ask for help when needed*).

CSU Principles of Community

Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.

Respect: We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

Diversity and Inclusion

Respect for Diversity: It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to

this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.

Grading Policy

Grades, like death and taxes, are inevitable. Please consult the information below and read through the following course policies section for a summary of how your performance in class and mastery of the course learning goals will be assessed.

GRADE	RANGE
A+	100% to 96.67%
A	<96.67% to 93.33%
A-	<93.33% to 90.0%
B+	<90.0% to 86.67%
B	<86.67% to 83.33%
B-	<83.33% to 80.0%
C+	<80.0% to 76.67%
C	<76.67% to 70.0%
D	<70.0% to 60.0%
F	<60.0% to 0.0%

CSU does not use grades of C-, D+, or D-.

ASSIGNMENT	GRADE POINTS	GRADE PERCENTAGE
SmartBook Assignments (25 @ 4pts each)	100	12.5%
In-class quizzes (10 @ 12.5pts each, two lowest dropped)	100	12.5%
iClicker and in-class work (4pts per class)	80	10%
Canvas Discussions (6 @ 10pts each)	60	7.5%



ASSIGNMENT	GRADE POINTS	GRADE PERCENTAGE
Midterm Exams (4 @ 100pts each, lowest dropped)	300	37.5%
Final Exam	160	20%
Total:	800	100 %

Course Policies

iClicker and in-class work: To allow for new students adding the class and time to register with iClicker the first three class sessions will not have any points associated with them. After that, each class will be worth 4 pts total and graded on both participation (50%) and correctness (50%). There will be a total of 23 graded class sessions, for a total of 92 available points. HOWEVER life happens and to enable some flexibility, your final grade will be out of 80 iClicker and participation points total. Additional points past 80 will not be counted and will not be considered extra credit. This policy is to avoid penalizing students who get sick or have other issues coming to class on a particular day.

Missed Exams and Quizzes: I understand, sometimes you get sick, your car breaks down or you have other commitments that conflict with attending class and you may miss an exam or quiz. To provide for flexibility your two lowest quiz scores and your lowest exam score will be automatically dropped. The flip side of this is that no make-up exams or quizzes will be provided. If you have a serious challenge or university approved reason for missing more than two quizzes or more than one exam please contact me and the [student case management office](#) so we can work together to find a solution.

Limited use of Generative AI: Some assignments, such as the Canvas Discussions, may be completed with limited use of generative artificial intelligence like Chat-GPT. Any work you submit should be reflective or your own research and thinking. As a rule of thumb, before using AI I suggest asking yourself: "Would I feel comfortable asking a friend or one of the LAs to help me in this way? Or, am I asking the AI to do something for me that I should really be doing?". Directly copying AI generated text or use of AI with little editing or input from you may be considered a violation of academic integrity. But AI may be used to assist with certain aspects of your assignment like improving grammar or clarifying a draft you wrote. Keep in mind that AI is known to "hallucinate" which could include making up animal species or referring to sources that do not actually exist. Turning in work with such errors will automatically be considered a violation of academic integrity. If you do use AI to

assist you on an assignment, add a brief note to the assignment providing the program you used and a brief description of how you used it.

Academic Integrity: Zoology and the study of animals, like all sciences, depends upon trust, honesty & transparency, and integrity. For the scientific community to collectively learn about the biology of animals it is imperative that scientists provide credit to others through proper citations, are honest and transparent about their research methods, use ethical research practices, collaborate, and engage with one another respectfully. Plagiarism, cheating, falsification, and bullying undermine these values and harm the norms that facilitate free and effective scientific inquiry. Thus, as students studying Zoology and the biology of animals in this course you are expected to embody academic integrity. This includes never engaging in the following forms of misconduct or similar inappropriate practices and reporting others if you learn of them engaging in misconduct:

- Cheating; includes using unauthorized sources of information and providing or receiving unauthorized assistance on any form of academic work or engaging in any behavior specifically prohibited by the instructional team.
- Plagiarism; includes the copying of language, structure, ideas, or thoughts of another, and representing them as one's own without proper acknowledgment.
- Unauthorized Possession or Disposition of Academic Materials; includes the unauthorized selling or purchasing of examinations or other academic work; stealing another student's work; unauthorized entry to or use of material in a computer file; and using information from or possessing exams that an instructor did not authorize for release to students.
- Falsification; any untruth, either verbal or written, in one's academic work.
- Facilitation; knowingly assisting another to commit an act of academic misconduct.

University Policies

Please see the [Syllabus University policies website](#) or use the QR code below for additional university policies relevant to this course.





Course Schedule

Date	T/R	Topic	Chapter/Smart Book Due	Discussions	Quizzes/Exams
16-Jan	T	Intro to Zoology	Chp. 1/Jan 22		
18-Jan	R	Ecology	Chp. 6/Jan 17		
23-Jan	T	Cell Structure and Function	Chp. 2/Jan 22	Prompt 1	
25-Jan	R	Genetics	Sect. 3.1 & 3.4/Jan 24		Quiz 1
30-Jan	T	Genetics	Sect 3.2 & 3.3/Jan 29	Post 1 Due	
1-Feb	R	Genetics	Sect. 3.5/Jan 31		Quiz 2
6-Feb	T	Exam 1	None	Reply 1 Due Prompt 2	Exam 1
8-Feb	R	Evolution	Chps. 4&5/Feb 7		
13-Feb	T	Evolution	Chps. 4&5/Feb 12	Post 2 Due	
15-Feb	R	Phylogeny & Taxonomy	Chp. 7/Feb 14		Quiz 3
20-Feb	T	Animal Origins & Highlights	Chp. 8/Feb 19	Reply 2 Due Prompt 3	
22-Feb	R	Phyla Porifera & Cnidaria	Chp. 9/Feb 21		Quiz 4
27-Feb	T	Phylum Platyhelminthes	Chp. 10/Feb 26	Post 3 Due	
29-Feb	R	Exam 2	None		Exam 2
5-Mar	T	Phylum Annelida	Chp. 12/Mar 4	Reply 3 Due Prompt 4	
7-Mar	R	Phylum Nematoda	Chp. 13/Mar 6		Quiz 5
12-Mar	T	Spring Break	Spring Break	Spring Break	Spring Break
14-Mar	R	Spring Break	Spring Break	Spring Break	Spring Break
19-Mar	T	Phylum Mollusca	Chp. 11/Mar 18	Post 4 Due	
21-Mar	R	Phylum Arthropoda I	Chp. 14/Mar 20		Quiz 6
26-Mar	T	Phylum Arthropoda II	Chp. 15/Mar 25	Reply 4 Due Prompt 5	
28-Mar	R	Exam 3	None		Exam 3
2-Apr	T	Phylum Echinodermata	Chp. 16/Apr 1	Post 5 Due	
4-Apr	R	Phylum Chordata	Chp. 17/Apr 3		Quiz 7



9-Apr	T	Fishes	Chp. 18/Apr 8	Reply 5 Due Prompt 6	
11-Apr	R	Amphibians	Chp. 19/Apr 10		Quiz 8
16-Apr	T	Non-avian Reptiles	Chp. 20/Apr 15	Post 6 Due	
18-Apr	R	Avian Reptiles	Chp. 21/Apr 17		Quiz 9
23-Apr	T	Exam 4	None	Reply 6 Due	Exam 4
25-Apr	R	Mammals	Chp. 22/Apr 24		
30-Apr	T	Gas Exchange & Nutrition	Chps. 26&27/Apr 29		Quiz 10
2-May	R	Reproduction	Chp. 29/May 1		
6-May	M	Final Exam (6:20 - 8:20pm)	None		Final Exam

Course Learning Goals

1. General Biological Knowledge

- 1.1 Distinguish prokaryotic and eukaryotic cells.
- 1.2 Identify organelles/structures of eukaryotic cells.
- 1.3 Illustrate the cell cycle and cell division (mitosis and meiosis).
- 1.4 Describe the structure of DNA.
- 1.5 Explain the process of gene expression through transcription and translation.
- 1.6 Identify Mendelian, Incomplete Dominance, Co-Dominance, and Additive mechanisms of inheritance; and make predictions about crosses using each mechanism.
- 1.7 Discuss ways sex is determined in animals (e.g. XY, ZW, ESD, XO, Haplo-Diploidy).

2. Animal Form and Function

- 2.1 Examine animal body symmetry and organization.
- 2.2 Describe morphological and genomic features common to all animals.
- 2.3 Illustrate the mammalian circulatory system.
- 2.4 Describe gas exchange in invertebrates.
- 2.5 Describe mechanisms of gas exchange over cutaneous surfaces, gill surfaces and lung surfaces of vertebrates.
- 2.6 Compare the transport processes of invertebrates and vertebrates.
- 2.7 Differentiate the ways organisms obtain nutrition (i.e. autotrophs, heterotrophs, herbivores, carnivores, etc.).
- 2.8 Distinguish macronutrients and micronutrients.
- 2.9 Examine diversity of digestive structures of invertebrates.

- 2.10 Explain the functions of the component parts of the vertebrate digestive system.
- 2.11 Explain ways animals reproduce asexually.
- 2.12 Discuss advantages and disadvantages of asexual vs. sexual reproduction.
- 2.13 Review reproductive strategies of vertebrates.

3. Ecology

- 3.1 Describe biotic and abiotic ecological factors that regulate animal populations.
- 3.2 Distinguish levels of ecological organization (i.e. organismal, population, community, ecosystem, biome).
- 3.3 Identify trophic interactions within an ecological community.
- 3.4 Differentiate types of symbiotic relationships.
- 3.5 Analyze threats to Earth's biodiversity.
- 3.6 Describe the evidence for climate change and its impacts on animal populations.

4. Evolution

- 4.1 Define evolutionary change as change in the heritable characteristics of a biological population over multiple generations.
- 4.2 Differentiate and explain the mechanisms of evolutionary change: mutation, natural selection, genetic drift, and migration (a.k.a. gene flow).
- 4.3 Describe the relationship between microevolution, speciation, and macroevolution.
- 4.4 Describe evidence for evolution.
- 4.5 Apply Hardy-Weinberg theorem to calculate allelic frequencies within a population and assess evolutionary change.
- 4.6 Differentiate types of speciation.
- 4.7 Assess the role of endosymbiosis in the evolution of eukaryotic cells.
- 4.8 Use parsimony to infer evolutionary relationships among organisms.
- 4.9 Interpret phylogenetic trees to assess the relationships among species.

5. Biodiversity and Diversity of Animal Life

- 5.1 Identify the 3 domains of life.
- 5.2 Discuss the phylogenetic relationships among animals, fungi, plants, and "protists".
- 5.3 Evaluate animal classification and evolutionary relationships.
- 5.4 Explain how the taxonomic hierarchy and names of animals reflect evolutionary relationships.
- 5.5 Review phylogenetic relationships within the Kingdom Animalia.
- 5.6 For every major taxonomic group (see list) discussed in class:
 - 5.6a Describe its relationship to other animal taxa.
 - 5.6b Identify and describe its distinguishing characteristics.



- 5.6c Describe general ecological characteristics of species in the taxon (i.e. terrestrial, marine, freshwater, etc.; predator, prey, parasite, etc.)
- 5.6d Compare and contrast morphological, physiological, and ecological characteristics of the taxon with other taxa.
- 5.6e Explain impact of species in the taxon on human society (i.e. medical concerns, economic impacts, food, ecosystem services, etc.).