

The Indiana Academy for Science, Mathematics, and Humanities

Zoology SCI04310

Spring Semester 2023

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Office hours: Monday 2:30-5 PM
Wednesday 2:15-5 PM
Thursday 1-3 PM on Zoom (Email me, and I'll send you a link.)
Friday 2:15-5 PM

Class meetings: MWF 10-10:50 with lab on T from 10-11:50, presumably in BU211

Some of the “laboratory” sessions will be field excursions; *i.e.*, we will conduct them outside. On the second Wednesday of every month I have a board meeting in Richmond and will not hold class. However, I will have an assignment for you to complete on Canvas during that time. I will provide you with details beforehand, but please write these dates on the calendar now:

11 Jan, 8 Feb, 8 Mar, 12 Apr, 10 May

Course description (from the Course Catalog, <https://academy.bsu.edu/catalog/>)

Prerequisite: One year biology

Co-requisite: Biology II: Zoology Lab (SCI4310L)

Credit: 1.5 credits

Offered: Spring

Zoology is a comprehensive survey of the diversity found in Kingdom *Animalia*. This course addresses the issue of why such diversity occurs, and what factors influence and constrain it. Laboratory explorations of live and preserved specimens allow hands-on examination of the structure and behavior of animals.

Course learning outcomes

A student completing this course will be able to describe the major characteristics of various animal groups and explain fundamental principles in animal physiology, behavior, and ecology.

Course textbooks:

Hickman, Cleveland P., Jr.; Larry S. Roberts; Allan Larson; and Helen l'Anson. 2004. *Integrated Principles of Zoology*, 12th ed.; McGraw-Hill: New York.

Hickman, Cleveland P., Jr.; and Lee B. Kats. 2004. *Laboratory Studies in Integrated Principles of Zoology*, 12th ed., McGraw-Hill: New York.

There is a lot of valuable information in your textbooks; however, you may notice that they are older editions. We will supplement these texts with other relevant material throughout the semester. Each student also needs a lab notebook in which to record lab and field observations. This should be separate from the notebook that you use for lecture notes.

Please note that some aspects of this course may need to be changed during the semester, so this syllabus is subject to revision. If the syllabus is revised during the semester, the updated syllabus will be posted on Canvas. Please refer to Canvas for updated information.

Assignments:

The assignments for the course are shown in the table below.

<u>Assignments</u>	<u>Date due (approximate)</u>	<u>Points</u>
Participation/homework/etc.	Every class meeting	50
Exam I	3 February	40
Exam II	1 March	40
Waterfowl report	31 March	50
Exam III	7 April	40
Time budget report	28 April	60
Lab practical	2 May	40
Lab notebook	3 May	30
Comprehensive final exam	TBA (8-11 May)	50
Total		400

Grading Scale:

100 – 93% = A	< 90 – 87% = B+	< 80 – 77% = C+	< 70% = D*
< 93 – 90% = A-	< 87 – 83% = B	< 77 – 70% = C	
	< 83 – 80% = B-		

Grades will be posted on Canvas and Powerschool. If I am late posting grades, you can estimate your current grade in the course by adding all the points you have earned or anticipate earning from all assignments. There are 400 points available in the course, so each point is worth 0.25%. **Please make an appointment to talk with me if you are concerned about your grade or uncertain about your standing in the course.**

There are 50 points allocated for participation, homework assignments, and other small projects that may arise during the course of the semester. Students are expected to participate in lab activities and also in "lecture" sessions. Although I may talk a lot during lectures, please raise your hand if you have a question or a thought you would like to contribute. We may plan some small group and/or class discussions as additional opportunities for you to participate. I will assign points based on my subjective assessment of how completely you participate in labs, field trips, discussions, and lecture sessions. As time allows, I will assign homework to help you practice what you are learning in between exams.

I am planning two lab projects that will require field excursions. The first will be a trip by van to nearby ponds and reservoirs to observe waterfowl communities. The second will be a walking excursion to observe squirrels and birds on campus. Observations from the field trips (including dates and times) should be included in your lab notebook (see below). For both of these projects, we will develop research questions (on the factors influencing waterfowl community structure and behavioral time budgets, respectively), and you will analyze data in formal research reports. Scientific reports follow a specific format, and we will discuss that in detail. I will assess your reports based on format, accuracy, organization, clarity, and reasoning.

For most other lab activities, I will not require you to submit reports but will ask you to draw pictures

of specimens, answer questions from the lab manual, record measurements and data, and take notes in a lab notebook. Always record the date and title of the exercise. At the end of the semester, I will look through your notebook and assign you a grade for it based on a holistic assessment of completeness, neatness, and attention to detail, so keep all the pages together. It may be helpful for you to keep a separate notebook for lecture notes so that you can study for the final exam if I collect your lab notebook for grading.

Readings from course textbooks and other sources will be assigned as we go along. Lectures and readings do not repeat each other perfectly; students are responsible for material from both. Exams are designed to assess students' ability to apply zoological principles, as well as knowledge of animal taxonomy, morphology, and ecology. The three unit exams will consist of multiple choice, matching, and constructed response (short answer or essay) questions over the material covered since the previous exam. The final exam will be comprehensive, meaning that it will cover material we have learned throughout the semester. There will also be a practical exam for which I will put specimens out for you to observe as you answer questions about them.

Attendance

Please arrive on time to class. The instructor is required to take attendance so that all students are accounted for. If you arrive late to class, someone might start checking to see where you may be. If you are late, you may need to remind the instructor to change the absence to tardy. This will disrupt our workflow and possibly the workflow of others, so please try to avoid being late.

If you miss lecture for any reason, you are responsible for obtaining any notes, announcements, reading material, or assignments from the instructor or a classmate. If you miss a lab, it may be difficult to arrange for you to make it up. Participation in lab is essential for your own success and for that of any student working with you. If an unavoidable emergency or illness prevents you from attending class or completing an assignment on time, please inform the instructor as soon as possible (preferably beforehand).

The Academy and not the instructor determines whether an absence is excused or unexcused. If an absence is excused, the instructor will make every reasonable effort to ensure you have the opportunity to make up any assignments associated with the absence. If the absence is unexcused, the instructor may accept late work as time allows, but a grade penalty of 10% per day late may be applied at the instructor's discretion. No direct grade penalty is assessed for an absence, but missing class is likely to make it very difficult for you to be successful in the course.

Safety

Please familiarize yourself with lab safety protocols and perform procedures with care. Because we hold class in a science lab, no food, gum, or drinks can be brought into the classroom. Your work area should always be free of clutter and only have the necessary materials (pens/pencils, notebook, etc.). We will be working with specimens that have been preserved using hazardous chemicals, so you will want to wash your hands after class. We have plastic gloves that you can wear when you examine specimens. We may have occasion to use sharp objects such as scalpels for dissection. Waste materials will need to be deposited in the biohazardous waste container. If there are glassware breakage or equipment problems, please notify the instructor immediately to ensure proper safety and equipment

protocols are followed.

Academic conduct

It is important to prepare for each class meeting by completing the reading and any assignments that are due. Assignments should be submitted on Canvas or in class, depending on the assignment. Although some activities such as labs may be completed in pairs or groups of students, each student is individually responsible for submitting assignments with original writing (not copied from your lab mate). You are encouraged to discuss answers to lab activities with other class members, but the wording should not be the same. Do not share word processing files with each other, but make sure each student has access to the raw data for analysis.

You are expected to conduct yourself according to the Indiana Academy Student Handbook (<https://academy.bsu.edu/handbook/>), especially the Code of Conduct and the section on Academic Integrity. On writing assignments, please be sure to use your own wording and cite all sources of information, whether from the Internet or otherwise. If you are not sure how to cite something, ask the instructor. Note that language copied verbatim from a book, website, another student's paper, or any other source is considered plagiarism unless it is in quotation marks and cited. Plagiarism is a form of academic dishonesty. Please do not plagiarize or cheat in any other way. An infraction may result in a 0 for the assignment. Also, the instructor is required to report any ethics violations to the Academic Integrity Board or (the Director of Academic Affairs and your parents).

Classroom conduct

Please be considerate of other classmates. Keep any devices not used for classroom activities silenced or off. Your phone should be put away if it's not being used for class. Laptops can be used in class for class activities, but repeated use for non-class activities may result in a loss of that privilege. Please treat each other with respect and refrain from annoying behavior. Do not interrupt another student or the instructor. If you are having difficulty getting a word in, you can raise your hand. Examples of improper conduct include having extended side conversations, working on assignments for other courses, sleeping, etc. Serious and/or chronic problems may be cause for dismissal from the course.

A calculator (but not a phone) may be used for exams.

Late assignments

If you are late submitting an assignment because you missed class, see the section above on attendance. If you are late submitting an assignment for a reason unrelated to missing class, the instructor may grade the assignment as time allows, but 10% will be deducted from the grade for each day late at the instructor's discretion.

If an exam is missed because of an excused absence, the instructor will make every reasonable effort to ensure you have the opportunity to make it up. If the absence is unexcused, a retake may be allowed at the instructor's discretion, but a penalty of 10% per day late may be assessed at the instructor's discretion. If a lab is missed, it may be difficult to arrange for a student to make it up due to supplies and logistical constraints. If the absence was excused, the instructor may need to substitute an alternate activity.

Course evaluations:

At the end of the semester, each student will have the opportunity to evaluate the course, instructor, and materials. The instructor will not see the results of the evaluations until after grades have been submitted. Your frank and constructive responses will help improve the course for future semesters.

Special circumstances:

If you need accommodations because of a disability, have emergency medical information to share with me, or need special arrangements in case the building needs to be evacuated, please make an appointment with me as soon as possible.

If you are struggling with study habits, stress, and/or personal issues, I encourage you to discuss this with your SLC and/or contact the Guidance Office for help in dealing with these issues so that you can thrive at the Academy. Many resources are available for students, and important contact information is listed below:

For academic assistance: Rebecca Hammons (rebecca.hammons@bsu.edu)
phone: 765-285-8108 office: WA 160-B

For tutoring: Donald Winslow (donald.winslow@bsu.edu) to find an Academy student tutor
To find a tutor through Ball State: iaguidance@bsu.edu
phone: 765-285-2889 office: WA 160-D

Mental health: Dr. Mindy Wallpe (mcwallpe@bsu.edu)
phone: 765-285-5483 office: WA 160-C

Ball State University Inclusive Excellence Statement:

Ball State University aspires to be a university that attracts and retains a diverse faculty, staff and student body. We are committed to ensuring that all members of the community are welcome through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse as expressed in our [Beneficence Pledge](#). For Bias Incident Response information, please click [here](#) or e-mail reportbias@bsu.edu.

Schedule of labs (subject to change)

Check Canvas for updates. Readings, if not otherwise specified, are from Hickman *et al.* 2004 *Laboratory Investigations in Integrated Principles of Zoology*, 12th ed., McGraw-Hill, NY.

Date	Exercises	Readings
3 January	Introduction to course, lab safety, microscopy, protists	Syllabus
10 January	Microscopy, protists	Exercises 1, 6
17 January	Cell division and development	Exercises 2-3
24 January	Animal classification	Exercise 5
31 January	Sponges and radiate animals	Exercises 7-8
7 February	Flatworms & pseudocoelomates	Exercises 9-10
14 February	Molluscs	Exercise 11
21 February	Annelids	Exercise 12
28 February	Chelicerates	Exercise 13
14 March	Waterfowl field trip	resources on Canvas
21 March	Crustaceans and insects	Exercises 14-15
28 March	Echinoderms	Exercise 16
4 April	Time budgets of gray squirrels or birds	resources on Canvas
11 April	Fishes and other chordates	Exercises 17-18
18 April	Amphibians & reptiles	Exercises 19-20
25 April	Birds & mammals	Exercises 21-22
2 May	Lab practical	comprehensive

Lecture schedule (subject to change)

Readings, if not otherwise specified, are from Hickman *et al.* 2004 (*Integrated Principles of Zoology*, 12th ed., McGraw-Hill, NY).

Date	Topic	Readings
4 Jan	Introduction to zoology	Ch. 1
6 Jan	The origin and chemistry of life	Ch. 2
9 Jan	Cell theory	Ch. 3
11 Jan	Online exercise (class does not meet)	Assignment on Canvas
13 Jan	Cellular metabolism	Ch. 4
18 Jan	Genetics	Ch. 5
20 Jan	Evolution	Ch. 6
23 Jan	Morphology	Ch. 9
25 Jan	Animal ecology	Ch. 38
27 Jan	Animal conservation	
30 Jan	Taxonomy	Ch. 10 pp 191-195
1 Feb	Review for exam I	Ch. 1-6, 9, 38
3 Feb	Exam 1	Ch. 1-6, 9, 38
8 Feb	Phylogeny	Ch. 10 pp 195-203
10 Feb	Outgroup analysis homework (class does not meet)	Assignment on Canvas
13 Feb	Reproduction	Ch. 7
15 Feb	Development	Ch. 8
17 Feb	Waterfowl research & scientific writing	Resources on Canvas
20 Feb	Waterfowl data from St. Gregory's University	Winslow's website
22 Feb	Porifera	Ch. 12
24 Feb	Ctenophores & cnidarians	Ch. 13
27 Feb	Review for exam 2	Ch. 7-8, 10, 12-13
1 March	Exam 2	Ch. 7-8, 10, 12-13
3 March	Acoelomate animals	Ch. 14
13 March	Pseudocoelomate animals	Ch. 15
15 March	Molluscs & Annelids	Ch. 16-17
17 March	Trilobites, Chelicerates, & Myriapods	Ch. 18, Ch. 20 pp 398-399
20 March	Crustaceans & Insects	Ch. 19, Ch. 20 pp 400-421
22 March	Echinoderms & hemichordates	Ch. 22

24 March	Protochordates	Ch. 23
27 March	Fishes	Ch. 24
29 March	Discussion on prairie dogs	TBA
31 March	Waterfowl report due	Assignment on Canvas
3 April	Time budget research	Resources on Canvas
5 April	Review for exam 3	Ch. 14-20, 22-24
7 April	Exam 3	Ch. 14-20, 22-24
12 April	Online assignment (class will not meet)	
14 April	Amphibians and reptiles	Ch. 25-26
17 April	Birds	Ch. 27
19 April	Mammals	Ch. 28
21 April	Support, protection, movement, homeostasis	Ch. 29-30
24 April	Respiration & circulation, nutrition & digestion	Ch. 31-32
26 April	Internal signaling	Ch. 33-34
28 April	Time budget paper due	Assignment on Canvas
1 May	Immunity	Ch. 35
3 May	Animal behavior	Ch. 36
5 May	Review for final exam	Comprehensive
TBD	Final exam	Comprehensive

Resources

American Society of Mammalogists

<http://www.mammalsociety.org/>

Ball State University Libraries

<https://www.bsu.edu/academics/libraries>

Birdnet (Ornithological Council, many links to other ornithological resources)

<http://www.nmnh.si.edu/BIRDNET/>

Ecological Society of America

<http://www.esa.org>

Google Scholar

<http://scholar.google.com/schhp?hl=en>

Index for Mammalian Species

<http://www.science.smith.edu/departments/Biology/VHAYSSEN/msi/default.html>

Macaulay Library of Animal Sounds and Video
<https://www.macaulaylibrary.org>

Nature Pages on the Web
<http://www.nicertutor.com/sketches/nature.html>

Ornithological Societies of North America
<https://opticsmag.com/ornithological-societies-of-north-america/>

Partners in Flight
<http://www.partnersinflight.org>

Society for Conservation Biology
<http://www.conbio.org>

Society for Integrative and Comparative Biology
<http://www.sicb.org/>

Tree of Life Web Project
<http://tolweb.org/tree/phylogeny.html>

University of Michigan Museum of Zoology Animal Diversity Web
<http://animaldiversity.ummz.umich.edu/site/index.html>

U.S. Fish and Wildlife Service
<http://www.fws.gov>

The Wildlife Society
<https://wildlife.org/>

Winslow's website
<http://donaldwinslow.info>