

**Zoology**  
**Biology 322 (3 credits)**  
**New Mexico State University, Fall 2022**

**Instructor:** Dr. Timothy Wright  
 Office: Foster 310 Phone: 646-1136  
 E-mail: Please use the Canvas website for all course-related e-mail.

**Office hours:** Tuesday and Wednesday 1:15-3:00, Foster 310 or by appointment

**Lectures:** Tuesdays and Thursdays, 10:30-11:20, Foster Hall, Rm. 231

<b>Labs:</b>	Section M1A	Thursday	11:30-14:00	Foster 318	Lauren MacDonald
	Section M1B	Thursday	14:30-17:00	Foster 318	Brian Ramos
	Section M1C	Friday	11:30-14:00	Foster 318	Brian Ramos
	Section M1E	Friday	08:30-11:00	Foster 318	Sarah Mesler

Note that the lab is included in the three credit hours for BIOL 322.

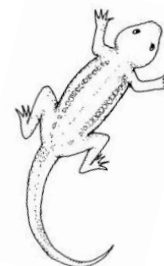
**You must sign up for both the lecture and a lab section to get any course credit!**

**Lab instructor office hours:** Office hours for the labs will be Thursdays 8:30-10:30 in Foster 318. Lab instructors can be contacted by email through the Canvas course website.

**Prerequisite courses:** Successful completion of BIOL 111, MATH 121G (or above), and sophomore standing is required. Successful completion of BIOL 211 is recommended.

**Texts:** The required textbook is *Animal Diversity*, 9th ed by Hickman, Roberts, Keen, Larson & Eisenhour, McGraw Hill Publishers. The required manual for the lab portion of the class is *A Photographic Atlas for the Zoology Laboratory*, 8th ed., by Van De Graaff & Crawley, Morton Publishing Co. Both are available in the campus bookstore and elsewhere.

**Course overview:** Zoology is the study of animal life. In this course we will survey the major groups that compose the diversity of life on Earth. The goal will be to understand the key anatomical, physiological and developmental characteristics that distinguish each group and exemplify their separate evolutionary solutions to the challenges of survival and reproduction. Evolution is the key process that underlies biological diversity. The main tool by which evolutionary patterns are organized is phylogenetic trees. Thus, a major theme of the course is understanding phylogenetic trees and how they are used to represent and interpret evolutionary history. Labs will be focused on learning to recognize members of each major group based on defining characteristics, and what these characteristics tell us about how different groups are related. The course is intended for undergraduate majors in Biology, Wildlife Science, Conservation Ecology, Science Education and related fields.



**Course webpage:** The course web page is available in the Canvas system. This page will be the main point of contact between students and instructors outside of class and you should make a point of checking it on a regular basis. General course information, lecture handouts, grades and other materials will be posted on this site. It is also the preferred route for e-mailing the lab instructors and me. Log in to Canvas at <https://learn.nmsu.edu/> and locate page for 'BIOL-322-

M01'. Lab sections will be integrated into this main course page; your lab grades and information will be available at the main course page listed above.

Please note that although Canvas will be the main route of contact between you and the instructor and TA's outside of class, other official communication from the university will often come through your NMSU e-mail box. Please access it regularly, or forward it to your primary address, as your success in college may depend on your ability to respond quickly to these messages. Note that it is possible to set up your Canvas account such that message sent within Canvas are also forwarded to your NMSU email account.

**Class format:** This will be an in-person only class—there will be no online or hybrid option. There will be two lectures each week, on Tuesdays and Thursdays. The third class meeting each week will be the laboratory section, which is required as part of the 3 credits for the course. Labs will be on Thursday and Friday.

**NMSU Covid-19 Safety:** All students are expected to adhere to the Crimson Commitment available [here](#) by getting vaccinated and boosted, monitoring and protecting your own health, protecting the health of other students, and keeping your community safe. Students should feel free to wear facemasks if they prefer to do so. Our class will be meeting in person (face-to-face). Attendance is expected at all class meetings as part of your participation in this class. If medical conditions require you to temporarily not attend class (e.g. you are in medically-recommended self-isolation), then you should contact the instructor immediately and we will figure out appropriate accommodations. If you can not meet in person at all, or if you do not feel you can abide by the COVID19 Classroom Safe Practices, then you should withdraw from the class.



### COURSE LECTURE

**Lectures:** Lecture attendance is expected except for documented university business or extreme emergencies. You are highly encouraged to ask questions and raise points for discussion throughout the lectures.

Lecture outlines will be posted as pdf files by 5 pm the day prior to lectures. Note, however, that these posted lecture notes are outlines only and do not contain all the information that will be discussed in class; **outlines are not a substitute for attending lecture and taking your own notes!** If you miss a class you should get the notes from one of your classmates and then see me in office hours to help fill in any gaps in the notes.

**Exams:** There will be three midterm exams and a comprehensive final. Midterm exams will be given during the class periods on **9/13**, **10/6**, and **11/1**. In total the midterms will be worth 30% of your course grade. The final exam will be **Tuesday 12/6 from 10:30-12:30 in Foster 231**. Half the final exam will cover class material since the third midterm and half will cover material from the entire course (i.e. will be cumulative). The final will be worth an additional 20% of your final course grade.

Most exam questions will be multiple choice, matching or short answer. Each exam will also include at least one longer question that will require problem-solving, integration and/or discussion of course material. Questions will cover material presented in lectures by the instructor and any guest lecturers and also material from textbook readings and any other sources designated by the instructor. Group study is highly encouraged, but all answers given on exams must be in the student's own words and no written materials are allowed in the exam.

**Missed exams:** If you will miss an exam on documented university business, you must provide the written documentation to Dr. Wright at least **two weeks in advance of the exam** and must make arrangements with him to take the exam early (i.e. before leaving on university business). If a serious and unavoidable medical or family emergency causes you to miss an exam you must provide **verifiable written documentation** of the emergency to the instructor. If this documentation is judged acceptable then you may make arrangements to take a make-up exam. If you do not take the exam and do not contact me, or your reason for missing the exam is not judged to be both serious and unavoidable, you will receive a zero for the exam and your course grade will be calculated accordingly.

### FIELD EXPERIENCE

Experiencing animals outside of the laboratory setting is crucial for a full understanding on Zoology; for this reason course credit is given for field experiences. You will earn 10% of the course credit for participating in the two opportunities described below (5% each trip).

Course coordinated field trip: A number of field trips will be offered throughout the course. The trips may include: observing bird migration at Bosque de Mesilla or Bosque del Apache, night-lighting for nocturnal animals in the desert, finding fossils the Paleozoic trackways, visiting NMSU's vertebrate or arthropod research collections, or other opportunities. We will discuss the field trip opportunities, provide sign-up sheets, and coordinate these expeditions.

Self-motivated field trip: This assignment gives you the opportunity to create your own Zoology field experience. Find your own way to discover new things about the animals and habitats in our region. Submit evidence of this experience- this may be a time stamped photograph, a signed brochure by a program organizer, an eBird sighting list, an iNaturalist observation, or a note from a park ranger. Examples are birdwatching hikes sponsored by the Mesilla Valley Bosque, a visit to the El Paso or Alamogordo Zoo or a visit to a Saturday morning program at the City of Las Cruces Museum of Science and Nature. (note: you cannot double dip with a course field trip). *The grader of this assignment has the right to give extra credit based on the awesomeness of your self-motivated field trip.*

### COURSE LABORATORY

**Laboratory sections:** The laboratory is a required part of the course and all students must sign up for and attend a laboratory section. **The first lab sections will be held on 8/25-26.** The lab activities will count as 400 points (40%) of the final course grade. **There will be two practical exams: on 9/29-30 and 12/1-2,** each worth 100 points. The remaining portion of the lab grade will be determined by lab quizzes and lab exercises. Note that your lowest lab quiz and lab exercise grades will be dropped from your final grade. You will, however, be responsible for knowing the material from all labs, as they are all covered on the practical. The assigned lab manual is required.

**Lab materials:** In addition to the required lab manual and your textbook, each student will need: a three-ring binder (1" size) with college-ruled notebook paper to hold lab exercises and extra notes, and ink pens and pencils. Dissection kits will be provided in the lab. **Please be sure to bring your lab notebook, lab manual, and textbook to your lab section each week.**

**Lab exercises:** The exercise for each week's lab will be provided in lab by your lab instructor. Lab exercises are due at the end of the class period unless otherwise instructed, and will generally be

returned during the next week's lab. They should then be placed in your lab notebook binder so that you have them available for studying for the lab practicals.

**Lab quizzes:** Many of the labs, including the first one, begin with a short quiz on the assigned reading material and, occasionally, on material covered in previous labs. To do well on these quizzes you must a) arrive on time and b) have done the assigned reading. **If you arrive more than 5 minutes late for the lab you will not be able to take the quiz.** Check the lab schedule below for reading assignments in your lab manual and textbook. Material for the quiz may come from either the lab manual or from the relevant textbook chapter (see below).

**Lab dissections:** Dissections are an important part of this course. If you are philosophically opposed to dissection but still wish to take this course you will not be required to carry out dissections yourself. **You must, however attend all labs and will be responsible for knowing all material to be learned from dissections.**

**Lab attendance:** Success in the laboratory section is dependent on your attendance and effort; it will be impossible to master the material if you do not attend labs. Unexcused absences will result in a zero for the quiz and lab exercise missed. If you miss a lab, it is your responsibility to find out what work you missed and to obtain handouts so that you can prepare for the lab practical. Make-up labs or quizzes will only be given in the case of an **unavoidable and well-documented emergency**. Contact Dr. Wright and your lab instructor through Canvas as soon as possible if you miss a lab due to such an emergency and be prepared to provide documentation of this emergency. If your documentation is judged adequate, then you may attend the scheduled office hours to complete the lab or an alternate assignment, if necessary.

Students who must miss a lab on documented university business must provide the written documentation to their lab instructor at least **two weeks in advance of the lab** and must make arrangements with them to take the lab early (i.e. before leaving on university business). Failure to follow this procedure will result in the student obtaining a zero for that lab. Under limited circumstances it may be possible to a student to attend a different section than the one to which they are assigned. Such requests must be made by e-mail through Canvas to both lab instructors and will be approved on a case-by-case basis.

**Lab safety:** Proper attire must be worn to protect you body from tissue preservatives during dissection. Shoes must enclose feet (i.e. no open-toed shoes or sandals) and legs must be covered by pants, long skirts, or lab coats. Gloves will be provided. Respiratory protection is recommended for pregnant women or people with respiratory problems. Children should not be brought to lab sessions for safety reasons. Food and drink are not allowed in the laboratory but may be left outside the lab door. Please exercise common sense in handling chemicals and animals and follow all safety instructions given by lab instructors. If you have any questions concerning the proper way to handle materials please ask your instructor.

Proper cleanup is an essential part of lab safety. You are responsible for cleaning up your bench area at the end of each lab. **Students who leave before their bench is cleaned will lose points from their lab exercise for that day.** Lab tables should be clean and wiped down, equipment should be clean and dried, trash should be in the proper receptacle, etc.

**Course Schedule** (subject to revision by instructor)

Note that the readings from BOTH the lab manual and textbook are required for labs.

Date	Lec/Lab	Topic	Lab Manual	Textbook
8/18	Lec 1	Introduction to Zoology		1
		<b>No labs this week</b>		
8/23	Lec 2	Genes, evolution and ecology		1, 2
8/25	Lec 3	Animal architecture		3
	Lab 1	Intro to BIOL 322 labs, Phylogeny		1, 4
8/30	Lec 4	Classification & phylogeny		4
9/1	Lec 5	Unicellular Eukaryotes (Protozoa)		5
	Lab 2	Microscope use, Protozoa	1,3	5
9/6	Lec 6	Sponges: Phylum Porifera		6
9/8		Catchup day and review session		
	Lab 3	Porifera, Cnidaria, Ctenophora	4, 5	6, 7
<b>9/13</b>		<b>Midterm Exam I (Lectures 1-6)</b>		
9/15	Lec 7	Radiate animals: Cnidarians and Ctenophores		7
	Lab 4	Acoelomates	6, 9	8, 9
9/20	Lec 8	Worms I. Acoelomate bilateral animals		8
9/22	Lec 9	Worms II: More Lophotrochozoans		9
	Lab 5	Pseudocoelomates, Molluscs	7	9, 10
9/27	Lec 10	Phylum Mollusca		10
9/29	Lec 11	Worms III. Annelids and allies. Nematodes.		11
		<b>Lab Practical I (Labs 1-5)</b>		
10/4	Lec 12	Worms IV: Smaller Ecdysozoans and catchup		12
<b>10/6</b>		<b>Midterm Exam II (Lectures 7-12)</b>		
	Lab 6	Annelids, Nematodes	8, 9	13
10/11	Lec 13	Arthropoda I. Chelicerata, Myriapoda		13
10/13	Lec 14	Arthropoda II. Crustacea		13
	Lab 7	Arthropods	10	13
10/18	Lec 15	Arthropoda III. Hexapoda		13
10/20	Lec 16	Echinoderms & Hemichordates		14
	Lab 8	Echinoderms and Hemicordates	11	14
10/25	Lec 17	Guest Lecture: Parasites, Dr. Hanley		
10/27	Lec 18	Introduction to Chordates, Tunicates		15
	Lab 9	Fishes	12,13	16
11/1		<b>Midterm Exam III (Topics 13-18)</b>		
11/3	Lec 19	Fishes		16
	Lab 10	Amphibia and Reptiles	14,15	19
11/8	Lec 20	Early Tetrapods and modern Amphibians		17
11/10	Lec 21	Amniote origins and nonavian Reptiles		18
	Lab 11	Aves	16	
<b>11/15</b>	Lec 22	Birds		19
11/17	Lec 23	Mammals		20
	Lab 12	Mammals	17	
11/21-25		<b>Thanksgiving Break</b>		
11/29	Lec 22	Conservation biology		
12/1		Catchup and review session		
		<b>Lab Practical II (Labs 6-12)</b>		
12/6	10:30-12:30	<b>Final Exam</b> (Half on Lects 19-22, half cumulative on Lects 1-21)		

**COURSE LOGISTICS**

**Withdrawals:** It is your responsibility to administratively withdraw from the class should you decide to do so. The last day to add the class is Friday 8/26. The deadline to drop without a W is Tuesday 9/2. The deadline to drop with W is Wednesday 10/14.

**Grading summary:** Your final course grade will be determined by the points you accumulate on each part of the course. The different parts are valued as follows:

Lab practicals	200 (2 practicals, 100 points each)
Lab exercises	150 (11 labs, 15 points each, lowest score dropped from final grade)
Lab quizzes	50 (11 quizzes, 5 points each, lowest score dropped from final grade)
Field experiences	100 (2 field experiences, 50 points each)
Midterm exams	300 (3 exams, 100 points each)
Final	200 (half over last quarter of class, half comprehensive)
<b>Total</b>	<b>1000</b>

You can use the following points scale as a guide to your overall grade in the course; I reserve the right to adjust the scale in assigning final grades. Fractional grades (pluses and minuses) will be used.

A	900 and above
B	800-899 points,
C	700-799 points
D	600-699 points
F	599 and below

Students taking the course on an S/U basis must earn  $\geq 700$  points to receive an S.

If you find a miscalculation in the number of points given on an exam, quiz or other assignment please bring it to the attention of your lab instructor. If you believe that you were not given appropriate credit for an answer on an exam, you may request a re-grade **within one week** of receiving your graded test. Your request must be in writing and detail how you think the grading was in error. After one week, you forfeit your opportunity to request a regrade.

**Academic Honesty:** Academic honesty is a fundamental expectation of your participation in this course and of your academic life at New Mexico State University. Academic misconduct reflects both personal and professional dishonesty. It hurts your ability to learn and your preparation for your future, no matter your chosen profession. It also damages the reputation of our university and diminishes the valuation of degrees from NMSU by your future employers. **For all of these reasons academic misconduct will not be tolerated in this class and any cases of academic misconduct will be prosecuted fully following NMSU procedures.**

The Student Code of Conduct defines academic misconduct, non-academic misconduct and the consequences or penalties for each. The Student Code of Conduct is available in the NMSU Student Handbook online: <http://studenthandbook.nmsu.edu/>. Academic misconduct is explained here: <http://studenthandbook.nmsu.edu/student-code-of-conduct/academic-misconduct/>. Academic misconduct includes, but is not limited to possession and/or use of unauthorized materials during exams; copying the work of another (e.g. another student, instructor or other reference source); using the words or ideas of another (e.g. another student, instructor or other reference source), especially without proper acknowledgement and citation (but keep in mind that citing a source

DOES NOT allow you to use their words and/or organization and/or structure if these are copied directly or substantially copied); providing another student the opportunity to copy your work on exams or assignment, looking at the work of another student during exams and providing another student the opportunity to earn participation points when they are not in class to earn them themselves.

Students must be especially careful to avoid **plagiarism**, particularly when writing research proposals and project posters. Plagiarism is defined as the presentation of others' ideas as your own, whether intentional or not. Any ideas or materials taken from another source must be fully acknowledged. Not only must you credit your source(s) for any ideas that are not your own, but you **MUST** paraphrase in YOUR OWN WORDS, or use quotation marks to indicate a direct quotation. The NMSU Library has more information and help on how to avoid plagiarism <https://nmsu.libguides.com/plagiarism>. If you submit an assignment in which you have merely changed a few words from a source, or have retained the structure and organization of your source, then you have submitted a plagiarized assignment, even if you have cited that source. Any act of plagiarism will result in a MINIMUM of a zero for that assignment, and more severe penalties (including failure of the course) may be imposed at the discretion of the instructor.

**Additional information:** Please visit <https://provost.nmsu.edu/faculty-and-staff-resources/syllabus/policies> for university policies and student services, including discrimination and disability accommodation, academic misconduct, student support services, final exam schedule, grading policies and more. Students should work through [Student Accessibility Services](#) (SAS) to determine if their individual circumstances require accommodations for any of the activities and assignments for this course. Documentation of any approved accommodations should be provided to the instructor as early as possible.

**Websites for further zoology information:**

- 1) McGraw-Hill, the publisher of your textbook and lab manual, has online resources on their website linked to your textbook. <http://www.mhhe.com/hickmanad6e>
- 2) The Animal Diversity Web from the University of Michigan's Museum of Zoology. General information, pictures, sounds, detailed anatomical sketches and phylogenetic relationships for a variety of animals. <http://animaldiversity.ummz.umich.edu/site/index.html>
- 3) The Tree of Life Web Page: a collaborative effort by biologists worldwide to assemble the evolutionary relationships of all life on earth. You can navigate out from the root of the tree or in from the tips to learn more about relationships between different groups. <http://www.tolweb.org/tree/>

**Tips for success in class:** Here are several tips to improve your success in Zoology.

- 1) Find a quiet place to study and use it regularly to read the textbook and review notes.
- 2) Attend lecture and take notes. The lecture outlines posted on the web are intended as an aid for note taking and are not a substitute for attending lectures.
- 3) Ask questions. Ask questions in lecture when you don't understand a point, or if you just need me to slow down for a minute so you can finish taking notes. I enjoy answering student questions.
- 4) Form a study group. Reviewing notes, discussing material and quizzing each other using the online textbook material while in a study group is a great way to reinforce what you have learned and fill in any gaps.
- 5) Visit your lab instructor or me during office hours. Sometimes questions don't occur to

you until after a class when you are reading through your notes. Office hours are there for you to ask these questions. Make use of this time—you've paid for it.

- 6) Keep up with the textbook readings. The reading assignments are generally one chapter per lecture. I highly recommend reading the chapters **before each lecture** rather than trying to absorb many chapters at one sitting.
- 7) Read the lab manual and relevant textbook chapter before attending lab. There will be quizzes at the start of most lab periods that will test you on material covered in those chapters of the lab manual and textbook.