

Syllabus Fall 2021: Mammalogy (EBIO 4760/5760; MUSM 5760)

Description: This is a lecture and lab course with the goal of providing a foundational understanding of the study of mammals. The lecture and lab will cover the origin, evolution, adaptation, biogeography, physiology, ecology, behavior, and taxonomy of mammals of the world, NA, and Colorado. The lab uses mammal skins, bones, and/or tissues. The prerequisites include the General Biology Lecture Courses (EBIO 1210 & 1220) or equivalent. This is an upper division course—we will delve much deeper into the subject matter and require a larger time-commitment to comprehend the material fully.

Instructor: Dr. Christy M. McCain
Associate Professor in EBIO & Curator of Vertebrates
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Office: Museum Collections/Bruce Curtis E190C
Office Hours: Monday 10am-noon or by appointment

Teaching Assistant: Grant Vagle
Ecology & Evolutionary Biology Graduate Student
Email: grant.vagle@colorado.edu
Office: MCOL E190A
Office Hours: Wednesday 1-3pm or by appointment

Lecture: MWF 9:10-10:00am

Lecture Location: Humanities 125

Lab: Wednesday 4:10-7pm, Thursday 9:35am-12:25pm, or Thursday 2:20-5:10pm

Lab Location: Museum Collections/Bruce Curtis Bldg: MCOL E280

Required Items:

- (1) **Mammalogy Lab Manual**—available at printing cost in lab (~\$20; 215 pages)
- (2) **iClicker Cloud**—free; sign up and link iClicker+ to a iClicker Student App account (see below)

Highly Recommended Items:

- (1) **Mammalogy: adaptation, diversity, and ecology.** Feldhamer, Drickamer, Vessey, Merritt, and Krajewski. John Hopkins Press. 4th edition (3rd edition okay) [**FDR**; Cheap used copies available on Amazon; CU library may provide chapter copies(pending)]
- (2) **Peterson Field Guide to Mammals of North America**, 4th edition. Reid, F. 2006. Houghton Mifflin Harcourt Press [ebook available at CU Library].

Other good mammalogy sources:

Animal Diversity Web. (<http://animaldiversity.ummz.umich.edu/site/accounts/information/Mammalia.html>).

Armstrong, D. M., J. P. Fitzgerald, and C. A. Meaney. 2011. Mammals of Colorado. Denver Museum of Nature and Science, and University of Colorado Press.

Borror, D. 1960. Dictionary of Word Roots. Mayfield Publishing Co.

Jones, J. K., Jr., and R. W. Manning. 1992. Illustrated key to skulls of genera of North American land mammals. Texas Tech University Press, Lubbock.

Lawlor, T. E. 1979. Handbook to the orders and families of living mammals. Mad River Press, Arcata.

Vaughn, T. A., J. M. Ryan, and N. J. Czaplewski. 2009. Mammalogy, 5th edition. Jones and Bartlett Pub.

Course Schedule: A preliminary schedule of lectures and labs is attached. Lecture and lab topics and dates are subject to change. Optional reading assignments for each week of lecture (based on FDR 4th edition) and lab are specified. To encourage students to participate in the lecture material, **iClickers accounts are required** and various numbers of lecture questions and points will be available each day for a total of 50 points across the semester. You will need to [create an iClicker Student App](#) account and [link your clicker+](#) to the App account in order for your clicker grade to be counted in my gradebook. You will also need to [register for my course](#) in the Student App, and [link your App account](#) to Canvas. Information on how to do this is located on the CUClickers [Student Resources page](#). Our classroom has limited wifi capabilities (fair rating). Therefore, I recommend you purchase and use an iClicker + for class. You may even be able to check one out from the Norlin circulation desk for the semester, on a first-come, first-served basis. If you choose to use the iClicker student app on your phone or computer, keep in mind that you may experience connection issues, and I cannot be held responsible for any points lost due to this fact. **Please set up your iClicker on the app BEFORE you get to class.**

Labs: It should be obvious that attendance at the lab sections is essential. You can probably find a way to work around missing an occasional lecture, but labs cannot be made up once the week is over and the specimens have been put away. If you must miss your assigned lab during some week due to illness, attend the exam review session for access to miss material. Because labs are so important in this class, we do keep track of attendance. **Five points will be subtracted from your final grade for every lab missed.**

Exams: There will be 2 lecture exams, a final exam, and 3 lab exams; none are cumulative, but each does build upon the previous sections. Each exam is worth 100 pts for undergraduates. Lecture exam questions will be fill-in the blank, short answers, and paragraph form. Each exam will include additional, advanced questions for graduate-level students only (EBIO 5760) worth an additional 25 pts.

Mammal Observations: Most mammals are hard to see since they are small and nocturnal. However, some can be seen during the day or with a little bit of effort and luck. Mammal observations are required. There are 14 species and 3 signs to document as observed and correctly identified using a camera with date/time imbedded with accompanying selfie with same date/time to insure it was your observation. These are due at various points across the semester (i.e., 5 in Sept.; 6 in Oct.; and 6 in Dec.). More information on these observations is available on the class website. There is also a competition for who can observe the most Colorado mammals (those more difficult to see) with digital observation beyond the required species and signs. There will be extra credit for 1st (20 pts), 2nd (10 pts), and 3rd place (5 pts) winners!

Grading: As a rule-of-thumb, grades will be awarded as follows: 90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; below 60% = F. Borderline cases = "+" & "-".

<u>Activity:</u>	<u>Undergrad Level (4760):</u>	<u>Graduate Level (5760):</u>
Lecture Exams (100 pts each)	200 points	250 points
Lab Exams (100 pts each)	300 points	375 points
Final Exam	100 points	125 points
Mammal Observations	51 points	51 points
iClicker Participation	50 points	50 points
Graduate Project:	--	100 points
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Total	701 points	951 points

Graduate Project (EBIO 5760 only): 100 points. Graduate students will meet as a group with Dr. McCain the second week of classes and discuss possible projects (solitary or group versions). Then, after the group decision of the project(s), we will set a timeline for progress and deadlines.

Syllabus Statements

Diversity, Equity and Inclusion

The diversity of students, faculty, and staff are critical to our educational mission. I expect all students in this class to actively contribute to an inclusive, anti-racist, respectful and equitable culture. Diversity is defined as *“the variety of similarities and differences among people, including but not limited to: gender, gender identity, ethnicity, race, native or indigenous origin, age, generation, sexual orientation, culture, religion, belief system, marital status, parental status, socio-economic difference, appearance, language and accent, disability, mental health, education, geography, nationality, work style, work experience, job role and function, thinking style, and personality type. Inclusion of various diversity dimensions may vary by geography or organization.”*¹ Inclusion is defined as *“a dynamic state of operating in which diversity is leveraged to create a fair, healthy, and high-performing organization or community. An inclusive environment ensures equitable access to resources and opportunities for all. It also enables individuals and groups to feel safe, respected, engaged, motivated, and valued, for who they are and for their contributions toward organizational and societal goals.”*¹ An anti-racist is someone who *“...is supporting an antiracist policy through their actions or expressing antiracist ideas. This includes the expression or ideas that racial groups are equals and do not need developing and supporting policies that reduce racial inequity.”* Equity is defined as *“fair and accessible treatment, involvement, and support for the diversity of people. Equity does not involve equal or the same distribution of resources across all populations, rather strategic distribution based on closing achievement, engagement and persistence/retention “gaps” by removing barriers for full participation.”*³

1-[The Centre for Global Inclusion, https://centreforglobalinclusion.org/downloads/](https://centreforglobalinclusion.org/downloads/)

2-Ibram X Kendi, How to be an Antiracist, Random House, 2019

3-Amy E. Moreno, Director of Inclusive Culture – CEAS, CU Boulder

Classroom Behavior

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the policies on [classroom behavior](#) and the [Student Conduct & Conflict Resolution policies](#).

Requirements for COVID-19

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements and all public health orders in place to reduce the risk of spreading infectious disease. Students who fail to adhere to these requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to [Student Conduct and Conflict Resolution](#). For more information, see the policy on [classroom behavior](#) and the [Student Code of Conduct](#). If you

require accommodation because a disability prevents you from fulfilling these safety measures, please follow the steps in the “Accommodation for Disabilities” statement on this syllabus.

As of Aug. 13, 2021, CU Boulder has returned to requiring masks in classrooms and laboratories regardless of vaccination status. This requirement is a temporary precaution during the delta surge to supplement CU Boulder’s COVID-19 vaccine requirement. Exemptions include individuals who cannot medically tolerate a face covering, as well as those who are hearing-impaired or otherwise disabled or who are communicating with someone who is hearing-impaired or otherwise disabled and where the ability to see the mouth is essential to communication. If you qualify for a mask-related accommodation, please follow the steps in the “Accommodation for Disabilities” statement on this syllabus. In addition, vaccinated instructional faculty who are engaged in an indoor instructional activity and are separated by at least 6 feet from the nearest person are exempt from wearing masks if they so choose.

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home. In this class, if you are sick or quarantined, required safety measures at CU Boulder relevant to the classroom setting include alerting Dr. McCain and your TA, Grant Vagle, that you cannot come to campus or class due to illness, and to set up make up times and work. Additionally, in our Mammalogy labs we have two additional requirements for protection of students and mammal specimens, including (1) no food and drink in the classroom, including water (if you need to drink, take a drink outside, not inside, the building); and (2) use of nitrile gloves (provided) when handling specimens.

Basic Needs Statement

In order to learn, students need to have met their basic needs: food and a safe place to live. If you are having trouble with either, the campus provides some helpful resources. Reach out of food@colorado.edu to connect with food resources. If you are having trouble paying for rent or facing housing insecurity, you can contact Mediation Services at 303-441-4364 or mediation@bouldercolorado.edu, and Off-campus Housing at 303-492-7053 or och@colorado.edu. A [Student Emergency Fund](#) exists to support students experiencing temporary financial hardship resulting from of Covid-19. Other campus resources are available, including mental health resources and free counseling at [CAPs](#). Please don’t hesitate to contact me if you have trouble negotiating these resources.

Accommodation for Disabilities

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code academic integrity policy. Violations of the Honor Code may include, but are not limited to: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found on the [Honor Code website](#).

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by or against members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or email cureport@colorado.edu. Information about OIEC, university policies, [reporting options](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about their rights, support resources, and reporting options.

Religious Holidays

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please let the instructor know 2 weeks ahead if you will be missing a lab or lecture exam for rescheduling at another time. See the [campus policy regarding religious observances](#) for full details.

Class Content Usage

The materials presented in this class in any form from text to video and online to in-person are only for the use in our class. My written permission is required to share these materials outside of the CU Mammalogy 2021 learning environment.

DAY	MAMMALOGY LECTURE	READINGS*	WED/THURS LAB
8/23	What is Mammalogy & Why Do We Care?	Lect: FHR 1-4	Mammal Lab Introduction, Osteology and Observations
8/25	What is a Mammal?	Lab: Manual Intro & 1 & pgs 216-225	
8/27	Mammal Traits II		
8/30	Mammalian Systematics	Lecture: FHR 4 skim Part 3	Prototheria & Metatheria
9/1	Mammal Orders I	Lab: Manual 2, FHR 12	
9/3	Mammal Orders II		
9/6	LABOR DAY – NO CLASS	Lecture: FHR skim Part 3	"Insectivora", Macroscelidea, Scandentia, Xenarthra, Pholidota, Tubulidentata
9/8	Mammal Orders III	Lab: Manual 3, FHR 13, 16	
9/10	Mammalian Evolutionary History I		
9/13	Mammalian Evolutionary History II	Lecture: FHR 4-5	LAB EXAM I (100 pts) Observations (n = 5) due by 9/19
9/15	Mammalian Evolutionary History III	Lab: Manual 1-3, FHR 12-13, 16	
9/17	Mammalian Evolutionary History IV		
9/20	Historical Biogeography of Mammals I	Lecture: FHR 5-6, PDFs	Dermoptera, Chiroptera, Primates
9/22	Historical Biogeography of Mammals II	Lab: Manual 4, FDR 13-15	
9/24	LECTURE EXAM I (100 pts)		
9/27	Historical Biogeography of Mammals III	Lecture: FHR 6, 26-27, PDFs	Rodentia & Lagomorpha
9/29	Pleistocene Megafaunal Extinction I	Lab: Manual 5, FHR 18	
10/1	Pleistocene Megafaunal Extinction II		
10/4	Ecological Biogeography of Mammals I	Lecture: FHR 7	Carnivora, Hyracoidea, & Sirenia
10/6	Ecological Biogeography of Mammals II	Lab: Manual 6, FHR 17, 19	
10/8	Ecological Biogeography of Mammals III		
*FHR readings listed for Edition 4; Edition 3 slightly different			

DAY	MAMMALOLOGY LECTURE	READINGS*	WED/THURS LAB
10/11	Mammalian Abundance I	Lecture: FHR 7-8 Lab: Manual 7, FHR 19-21	Proboscidea, Perissodactyla, Cetartiodactyla
10/13	Mammalian Abundance II		
10/15	Mammalian Adaptations: Size & Shape		
10/18	Mammal Stances & Locomotion Variation	Lecture: FHR 11, 9 Lab: Manual 4-7, FHR 13-15, 17-21	REVIEW LAB Observations (n = 6) due by 10/24
10/20	Locomotion: Skeletal Adaptation I		
10/22	Locomotion: Skeletal Adaptation II		
10/25	Mammalian Reproduction	Lecture: FHR 9-10 Lab: Manual 4-7, FHR 13-15, 17-21	LAB EXAM II (100 pts)
10/27	Mammalian Thermoregulation & Metabolism		
10/29	Adaptations to the Cold I		
11/1	Adaptations to the Cold II	Lecture: FHR 9-10 Lab: Manual 8, Peterson Guide	COLORADO MAMMALS I
11/3	Adaptations to the Cold III		
11/5	LECTURE EXAM II (100 pts)		
11/8	Adaptations to the Heat I	Lecture: FHR 14 & 21 Lab: Manual 9, Peterson Guide	COLORADO MAMMALS II
11/10	Adaptations to the Heat II		
11/12	Echolocation I: Bats		
11/15	Echolocation II: Adaptations & Habitat	Lecture: PDFs, FHR 22-24 Lab: Manual 10, Peterson Guide	COLORADO MAMMALS III
11/17	Echolocation III: Cetaceans		
11/19	Social Behavior I		
11/22	FALL BREAK: No Classes		
11/24			
11/26			
DAY	*FHR readings listed for Edition 4; Edition 3 slightly different		

DAY	MAMMALOGY LECTURE	READINGS*	WED/THURS LAB
11/29	Social Behavior II	Lecture: FHR 24-25	REVIEW LAB Final Observations (n = 6) due by 12/5
12/1	Social Behavior III	Lab: Manual 8-10, Peterson Guide	
12/3	Mammalian Conservation I		
12/6	Mammalian Conservation II	Lecture: FHR 30, PDFs	FINAL LAB PRACTICAL (100 pts)
12/8	Mammalian Conservation III	Lab: Manual 8-10, Peterson Guide	
12/10	No class: READING DAY		
12/15	FINAL EXAM (Wednesday 730-10 pm)	Lecture classroom	