BIO 320 – Section 01- 2024
Animal Kingdom
Tentative Syllabus, Fall, 2024
College of Arts & Sciences Syllabus

Contents

COURSE INFORMATION

Lecture time and location: In person11:50-2:30 M W in BBH-331
Special Fees: $25.00

First Day of Classes: We begin on Monday, August 26

Course Description:
The animal kingdom will be explored through the anatomy, physiology, and developmental histories of the major animal clades. Students will examine the ecological significance of select clades and the niches and adaptations found among the major animal phyla. Our dynamic understanding of the relationships between the branches of the animal kingdom will be investigated through both cladistics and the traditional Linnaean approach. Lecture and laboratory.

Course Prerequisites:
BIO-201 with a minimum grade of C and BIO-202 with a minimum grade of C and (BIO-250 with a minimum grade of C or BIO-150 with a minimum grade of C).
First day of our class: Monday, August 26, 2021
All Materials Due by December 12!

FACULTY and CLASS INFORMATION

Instructor: Dr. M. Readey.
Office Location and Hours: ONLINE ZOOM **and Inperson hours BBH 352B**
Online: Sunday 10 a.m.-2:30 p.m.; Tuesday 10 a.m.-3 p.m.
In Person: MW 10-11:30 a.m. and 2:45-3:45p.m. (bookending our class)
https://neiu-edu.zoom.us/j/3038240479 Meeting ID: 303 824 0479
Upon request, review sessions can be scheduled before exams.
Other office times are also available by appointment.

Phone Extension: NA Contact me through N MAIL.

NEIU N-mail address: mareadey@neiu.edu

Other Important Dates for Our Class:

NEIU Classes Begin on Monday, August 26

Monday, September 2	Labor Day Holiday - No Classes
Thursday, November 28-Dec 1	Thanksgiving Break; no classes
Monday, December 9	Last day of regular classes
Tuesday, Dec 10-12	Final Exams week.

ATTENDANCE:

NB: Cited from the schedule of classes, inside front cover: "POLICY ON FIRST CLASS SESSION

Department instructors may reassign a student's seat in a class if the student does not attend the first class session and neglects to inform the instructor in advance of the intended absence. The student will be responsible for any financial consequence if the course is not dropped officially by the student before the appropriate refund deadline. Failure to officially withdraw from class will result in a grade of F."

Syllabus Statement for Recordings:

In this class software may be used to record live class presentations. As a student in this class, your participation in live class discussions may be recorded. These recordings typically will be made available only to students enrolled in the class to assist those who cannot attend the live session or to serve as a resource for those who would like to review the content that was presented.

The University's Final Exam Schedule is at the end of the syllabus or at
https://www.neiu.edu/sites/default/files/documents/2024/05/28/Examination%20Periods%20Fall%202024.pdf

Course Materials

This class is an introductory survey of the choanozoa and the multicellular members of the animal kingdom, with emphasis on the systematics, ecology, anatomy, physiology, and evolution. You will learn these principles by developing an understanding of the systematics, anatomy and physiology of different phyla. Phyla will be grouped and presented in what is currently considered valid phylogenetic groupings, but you will also be given historical background to help you better understand older literature that you may need to access. *It helps to spend some time learning the roots and meanings of the names of the clades!*

List of Required and Suggested Texts / Online Materials:

Our Texts

***Photographic Atlas of Entomology & Guide to Insect Identification* by James L. Castner 978-0962515040 Spiral Bound Jan 1, 2001.** *This is a required text and an essential guide to identifying most local insects to the level of family.*

***Animal Evolution* Interrelationships of the Living Phyla Third Edition Claus Nielsen 9780199606030 Paperback February 20, 2012**. *We will follow the phylogenies given in this text. It is a strongly recommended text. If you choose to use an older edition, be aware that the classifications have changed, and you cannot simply follow the ones in the older text. If you choose not to purchase it, I will deposit my copy in the library on reserve.*

Currently, we are experiencing ***rapidly evolving knowledge of the animal kingdom and its systematic****. Because of the frequent changes, there is presently no single text that meets the demands of this class. We will be using a variety of sources in addition to the Nielson text. This*

book comes closest to the most recent cladistic analysis of the animal kingdom (vertebrates excluded).

In addition to these physical books, you will be in a group that will read and report on one popular-science book on animals. Those books are listed toward the end of this paper, just before the examination schedule and the explanation of the insect collection.

Website links for Invertebrate Zoology:

There are several online resources in Zoology that you will need to access during this semester. To get you started, bookmark the following pages on your personal browsers. When studying an assigned link, you should also look at the links immediately downstream from the recommended entry site. For example, if you are studying the Cnidaria at the Berkley site, then also look at the clades within the Cnidaria.

OUR LAB e-"BOOKS":

We will be using one major online (a.k.a.free) lab book. You can find it at:
http://lanwebs.lander.edu/faculty/rsfox/invertebrates/ (The link works as of August 9, 2024)

Caution on Supplemental Sources:

Our textbook takes a very detailed and radical approach to the reclassification of living things. Neilson is among the most respected systematists currently working. His book looks at data from many sources, including embryology, anatomy, histology, genetics, and paleontology. This broad base gives his work a solid, multi-pronged foundation that many other sources lack.

There are other views of animal evolution in circulation. I caution against the use of online websites, even good ones, because of the rapidity of change and because of the many different views on how animals are related.

The *Tree of Life* Website now lags behind the curve, and it may conflict with our textbook. When in doubt, follow Nielson UNLESS I STATE OTHERWISE. Systematics is a dynamic and changing science that currently experiences many changes due to new information from embryology, genetics, and paleontology. That said, it can lead you to information and primary sources about specific branches. http://www.tolweb.org/tree/
Due to its scope, this site tends to be a bit behind the curve. I have used it in the past, but I no longer recommend it as a primary supplemental source.

The other excellent online source for nut-shelled information on specific taxa is
http://www.ucmp.berkeley.edu/help/taxaform.html
The Berkeley site also tends to be out of date, so be careful when you use it.

I will add other sources and post news updates should I find good ones.

WARNINGS SPECIFIC TO THIS CLASS

Warning I: This class requires the dissection of animal specimens. These organisms are already dead, so whatever we do, we cannot hurt them or inflict pain of any sort. If you have ethical, religious, or other objections to the dissection of dead animals (or observing the dissection), then this class is not for you. You have been warned about this feature of the class, and you will not be excused from dissection.

COURSE OBJECTIVES / STUDENT LEARNING OUTCOMES

OBJECTIVES: Biology 320 is an introductory course focusing on systematics (= evolutionary relationships), anatomy, and physiology of animals. During this course, I will expect you to complete the following baseline learning tasks.

I. SYSTEMATICS AND TAXONOMY

- Understand the basic concepts of cladistic analysis and be able to classify organisms in accordance with the principles of phenetics and cladistics.
- Production of a parsimonious tree using these concepts
- To be able to identify animals to specific clades based on their anatomy
- Effectively use a dichotomous key to identify unknown organisms
- Generalize the skills necessary both for cladistic classification and for identification of unknown specimens based upon a knowledge base developed in class.
- Determine appropriate traits for use in cladistic analysis and explain why certain traits would result in misleading or invalid trees
- Be able to compare and contrast systematics and taxonomy.
- Develop the vocabulary needed for communication with your fellow biologists and health-care professionals

II. EVOLUTIONARY THEORY

- Be able to explain how systematics and evolutionary theory are related
- Explain how one can use various features of animals
- Be able to explain how simplification, rather than complexification, has been a dominant trend in much of animal evolution
- Interpret a cladistic or phenetic tree in terms of evolutionary theory, describing the relationships among the branches.
- Develop an understanding of the inter-relationships among extant and extinct animals and the ability to use this understanding to make choices for research subjects.

III. ANATOMY AND PHYSIOLOGY

- Be able to compare and contrast different physiological adaptations to similar environments across the animal kingdom.

Be able to explain how organisms use different means to complete the same tasks of life.

Compare, contrast, and explain the function, presence, and structure of specific organ systems in different clades.

Be able to identify and explain the evolutionary relationships among clades based on their similarities and differences in anatomy

Be able to place these organ systems and their functions within a context of evolution and adaptation.

IV. PRACTICAL SKILLS

Explain how the knowledge of the evolutionary relationships among organisms applies to other branches of biology, chemistry, pharmacology, and medical science.

Understand how the anatomy and physiology of organisms influence their use of niches and how these features can be used to alter population growth patterns

Produce hypotheses about animal ecology and behavior based on their anatomy, physiology, and systematics.

Be able to use a dichotomous key

Be able to collect and identify common orders and families of insects found in the Chicagoland area.

V. LABORATORY SKILLS

Be able to identify the major groups of animal tissues across the animal kingdom to the levels of organization indicated during class, with the additional goal of understanding the phylogenetic (evolutionary) relationships among the animals. among tissues, among genes, and among life stages

Be able to identify major organs and organ systems in diverse clades and explain their function within that clade and how they are adaptive.

Be able to compare and contrast organ systems across clades.

GRADING: STUDENT TASKS / ASSIGNMENTS / REQUIREMENTS

Grading: Your grade will be determined in the following manner

Exams, Practicals, Quizzes: 570 points

Quizzes …….	190 points
Concept Exams ……	200 points
Practicals …….....	180 points
Quiz and Exam Total	**570 points**

Insect Identification and Museum Curation Project: 150 points

(Due Wednesday, October 23; No extensions. If you are behind, expect to stay for a marathon session that day.) The assignment is described in detail at the end of the syllabus Note: The best collection of the semester receives the coveted Blue Scarab Award.

Book Review and Presentation: 80 Points

Total Points for the Semester: 800 Points

Final Percentage Grade:
90% + = A 80% + = B 70% + = C 60% + = D < 60% = F

I keep all tests and assignments. You are, however, welcome to come and review exams with me. This offer is essential if you are not doing well in the class.

Exam and Quiz Formats:

Lecture exams: Lecture exams will consist of multiple-choice questions.

Lab exams: Laboratory exams will ***not*** be multiple choice. Each lab exam will be presented in the practical format, from both specimens and PowerPoint slides. Everything is potential fodder for these exams.

The quizzes will be on D2L throughout the semester. Laboratory quizzes will be identification-based, not multiple-choice. Lecture quizzes will be multiple-choice and matching. The quizzes should give you information about where you need to focus your efforts before the upcoming exams. However, remember: A point is a point is a point, no matter how you get or lose it.

ONE FREE LATE PASS:

During the semester, you can take **one** Concept Exam, Practical, or Quiz late without penalty. It can be up to two weeks late or on December 11, whichever comes sooner. This is a precious opportunity, so I recommend that you hoard it. Once it's gone, it's gone.

MAKE-UP POLICY

RECORDED LECTURES AND STUDY AIDS

1. If you are in the honors section, additional criteria will apply.
2. There is no OFFICIAL policy of required attendance. However, it is unlikely that you will earn an acceptable grade if you do not attend class regularly. I will be recording the bulk of my lectures in case you cannot attend on one or more days.
3. My lectures are key components of examinations. Therefore, pay attention to them and to the review sheets. (I didn't get carpel tunnel syndrome for nothing!) Attendance alone does not guarantee a passing grade. Because of the ongoing COVID situation, I will be lax on attendance. That means that if you cannot attend in person, you should try to go over the recorded materials from class.
4. **It is vital that you take complete and comprehensive notes of the lecture material.**

5. It is also *essential that you study regularly*. The material in this class does not lend itself to cramming. Learning systematics is like learning the violin. It takes repeated sessions of practice.

6. ***One cannot learn to recognize organisms and their systems by site during crammed class periods any more than one could learn a new language of the violin this way. I would normally expect someone to spend 3-5 hours per week in the lab studying the materials on their own. That is why our meetings will be heavily dedicated to lab work.***

7. Reading through the slides and lab pages beforehand will help you better understand the in-class materials. This class is far more joyful if you come prepared. That taxonomy is based upon the most up-to-date systematics that you are likely to find.

8. As soon as possible after each lecture, you should reread and/or rewrite your notes and reread the materials to ensure that you took accurate notes and fully understand the material that was covered. Rewriting the material long-hand is a far more effective memory tool than typing into a computer. Try using two columns, the first listing broad concepts and the second containing a list of facts and supportive evidence linked to that concept.

9. Look over the study guides prior to class whenever possible. Then, use the study guide to organize your notes after class. The sooner you reinforce the material, the more likely it is to stick. Prior to the exam, use the study guide to re-assess whether you have learned the material, but do not depend on this guide as a quick way to cram.

10. Study Suggestions for Introductory Biology from other universities.

- Take time to draw pictures, trees, and diagrams. This is particularly important for understanding the interrelationships among organisms and for recognizing anatomical structures.
- Understand the terminology by dissecting the words. Don't try to memorize random words without understanding their origins. It will only frustrate you. If you speak a romance language, it will give you an advantage.
- Set aside study time each day. You retain more information if you keep reinforcing the material than if you try to learn everything at once.
- Use a system of not taking that works for you, such as the Cornell System. (Template Here).

11. Talking or other disruptive behavior during lecture will not be tolerated, and you may be asked to leave.

12. Academic dishonesty includes giving, receiving**, or using unauthorized aid on any academic work. This includes a person who has taken a test discussing what was on a test with a person who has not taken the test. Any student guilty of cheating—including plagiarism—will receive an F grade, and their conduct may be reported to the dean of students for potential further action, including expulsion from NEIU.**

Logic of the schedule.
The animal kingdom separates into several large patterns of evolution (clades). We will attempt to follow the major lines of animal evolution in a pattern that reflects these relationships***. Because we lack the time, we will only be able to do a quick overview of the organisms in each clade,*** focusing instead on a few representatives of each clade and a few model systems within the clades. **For a more in-depth treatment of the invertebrates, you will need to take Invertebrate Zoology.**

Our Meetings: During class, we will focus heavily on lecture and lab work, including the insect collections. Part of each class will be dedicated to questions. If there are no questions, the lab will continue.

Practice!: JUST ATTENDING CLASS IS INSUFFICIENT TO PASS. You must dedicate part of your study to lab as well as lecture work. This material is not cramable! To get a good grade, you should expect to dedicate at least one to two hours a week to studying the slides or their images outside of laboratory time. *(One of the best ways to learn the material is to draw the specimens and label them. This process seems to help wire the images into the brain!)*

TENTATIVE TOPIC SCHEDULE

The following schedule is subject to revision to allow for more or less time on various topics as needed or because of potential school closures such as snow days. Some lab time will also be devoted to additional lecture material.

We may be ahead or behind during any given week. You need to work with me and let me know when you are having trouble comprehending a section. *(One of the best ways to learn the material is to draw the specimens and label them. The process seems to help wire the images into the brain!)*

Week	*Topic*	*Topics*	*Quiz*	*Concept Exams and Practicals*	*Projects and suggested text chapter readings*
Week 1 Aug 25-31	*Cladistics and Phenetics*	*Tissues and Choanozoa*			*Chapters 1,2*
Week 2 Sept 1-7	*LABOR DAY No Class*	*Early Animal Radiation; Porifera 1*	*Q1 Sept 6*		*Chapters 3, 4 suggested*
Week 3 Sept 8-14	*Siliacea, Calcerea, Homoscleromorpha*	*Eumetazoa/ Placozoa*	*Q2A-2B Sept 9*		*Chapters 5-9 Silacia, through Homoscleromorpha*

Week 4 Sept 15-21	*Placozoa/ Neuralia Hypothesis*	*Ctenophora*	*Q3A-3B Sept 20*		*Chapter 10-12, 15 EUMETAZOA through CTENOPHORA*
Week 5 Sept 22-28	*Cnidaria & Diploblastea*	*Xenoturbellids and Clade Eubilateria*		*Practice Practical Sept 22 Concept Exam 1a Sept 24 Exam 1B Sept 25*	*Chapters 13,14; Chapters 18, 20, 21 Concept exam 1 includes everything through the Cnidaria*
Week 67 Sept 29-Oct 5	*Platyhelminthes*	*Lophophorates: Ectoprocta, Entoprocts, Brachiopoda, and Phoronids*		*Practical 1A Sept 30 Practical 1B Oct 2*	*Chapters 11,29 Chapters 36,38, 39, 40,41.*
Week 7 Oct 6-12	*Annelida*	*Sipuncula*	*Q4 Oct 7*		*Chapters 25, 26*
Week 8 Oct 13-19	*Nemertea*	*Mollusca*	*Q5 Oct 14*	*Concept Exam 2A Oct 18*	*Chapter 28, 27*
Week 9 Oct 20-26	*Rotifers & Chaetognaths*	*The "Lower" Cycloneuralians*	*Q6A Oct 21* *Q 6B Oct 21*	*Practical 2A Oct 23*	*Chapter 31, 34; Chapter 30, 52-55*
Week 101 Oct 27-Nov 2	*Pararthopoda (Onychophora and Tardigrada)*	*Arthropoda 1*	*Q7 Nov 1*	*Concept Exam 2B Oct 28 Practical 2B Oct 30*	*Chapters 43-46 Wednesday, Oct 30, is Come-As-Your-Favorite-Invertebrate Day!*
Week 11 Nov 3-9	*Arthropod 2* *If you think this is overkill on the arthropods, consider this: The bulk of all animals are arthropods!*	*Arthropods 3 Student Presentations*	*Q8-9 Nov 4*	*Concept Exam 3A Nov 8*	*Chapter 46 Book Reviews and Presentations*
Week 12 Nov 10-16	*Arthropods 4 & intro to the Deuterostomes*	*Hemichordates*	*Q10 Nov 13*	*Practical 3A Nov 15*	*Chapter 46 Chapter 57, 59-61*

Week 13 Nov 17-23	*Echinodermata*	*Urochordates and Cephalochordates*	*Q 11 Nov 18 Q 12A-C Nov 20*	*Practical 3B-C Nov 22*	*Exam 3 Through Arthropoda Chapter 58; 63-64 Insect Collection Final Push: Saturday, Nov 23. The lab will be available for a marathon pinning & identification session.*
Week 14 Nov 24-30	*Craniata Vertebrates through Sarcopterygii*	*Insect Collections Due!!!*	*Q13A-B Nov 26 Quiz 14 Nov 27*	*Concept Exam 3B Nov 25 Practical 3D Nov 26*	*Chapter 65 Insect Collections are due by the start of class on Wednesday.*
Week 15 Dec 1-7	*Vertebrates; Diapsida The Blue Scara Award*	*Vertebrates: Synapsids*	*Q 15 Dec 2*	*Concept Exam 4A-B Dec 3 Practical 4A-B Dec 5*	*Final Exam and Practical 4 Deuterostomia Will be spread out over these last two weeks.*
Week 17 Dec 8-11	*Final Exam Week Review only Scheduled for Monday, Dec 9*	*More review scheduled for the in-class exam period, Tuesday, Dec 10*		*Practical 4C-D Dec 9 Concept 3C Dec 10*	
End of the Semester. Have a Wonderful Break! You've earned it.					

COURSE POLICIES AND STATEMENTS

Attendance and Absence Policies:

ATTENDANCE: *Per university policy, department instructors may reassign a student's seat in a class if the student does not attend the first class session and neglects to inform the instructor in advance of the intended absence. The student will be responsible for any financial consequence if the course is not dropped officially by the student before the appropriate refund deadline. Failure to officially withdraw from class will result in a grade of F."* (Cited from the schedule of classes, inside front cover: *"POLICY ON FIRST CLASS SESSION")*

Beyond the dates of initial attendance, the university has not set attendance criteria. However, if you are not present, you cannot earn potential bonus points or take examinations or quizzes. Active attendance remains a strong indicator of success!

Because the tests are based on lecture materials, it is unlikely that you will earn an acceptable grade if you do not attend class regularly. Because my lectures are critical components of the exams, an absence means that you will miss any significant changes or verbal additions to the presented material. Attendance will be considered in the final grade, especially in borderline cases. In addition to the quizzes, I will take a pop-attendance several times during the semester. If present, you will receive a few points. Attendance alone does not guarantee a passing grade.

Academic Integrity Policy:

By enrolling in this course, you are bound by the NEIU Student Code of Conduct: http://www.neiu.edu/university-life/student-rights-and-responsibilities/student-code-conduct. You will be informed by your instructor of any additional policy specific to your course regarding plagiarism, class disruptions, etc.

ADA Statement:

Northeastern Illinois University (NEIU) complies with the Americans with Disabilities Act (ADA) in making reasonable accommodations for qualified students with disabilities. To request accommodations, students with special needs should make arrangements with the Student Disability Services (SDS) office, located on the main campus in room D104. Contact SDS via (773) 442-4595 or http://www.neiu.edu/university-life/student-disability-services.

If you need special accommodations because of a disability, you must let me know and present HELP-centre documentation ASAP. In most cases, accommodations can be made, but I need to know about them to arrange for the accommodation.

Campus Safety

It is recognized that a safe university environment is a shared responsibility of faculty, staff, and students, all of whom are expected to familiarize themselves with and cooperate with emergency procedures. Web links to Campus Safety: Emergency

Web links to Campus Safety: Emergency Procedures and Safety Information can be found on NEIU*port* on the MyNEIU tab or as follows:
https://www.neiu.edu/sites/neiu.edu/files/documents/2020/01/26/emergencyflipchart_maincampus.pdf.
If you have a smartphone, you can also receive alerts about campus emergencies:
https://www.neiu.edu/university-life/university-police/n-safe-emergency-notification

ADDITIONAL COURSE INFORMATION

Missed Examinations:
Typically, there will be no make-ups on examinations without a serious, acceptable, and verifiable reason.

Course Communication (University statement)
All pertinent electronic communications between the instructor and students are conducted exclusively through NEIU e-mail and our D2L site. Thus, it is the responsibility of students to check their NEIU e-mail account and the D2L site for all significant information, including updates on class cancellations in the event of threatening weather conditions. Communication between the instructor and students via personal e-mail accounts (e.g., @gmail.com or @yahoo.com) will not occur.

Incompletes
An "I" (incomplete) may be given if a student is absent from the final examination or fails to complete a special research or individual study project ***because of some unavoidable circumstance, such as illness. Not showing up for the exam without a verifiable and acceptable reason will result in a grade of zero, not an I.*** Students will have one semester after the incomplete grade has been assigned to remove the incomplete. Incompletes that have not been finished in that time, will be changed to an "F" grade.

Late Work
Late assignments:
Assignments late by one day will receive a 10% grade reduction. Any assignment that is more than one day late will not be graded and will be recorded as a zero. *UNLESS arrangements are made or you have an excellent reason for the delay.*

Late work is strongly discouraged. Turning in work late can impair your chances of success in the course. This late work policy applies to all graded assessments (including the final examination) in the course, with the exception of the discussion threads. Because class discussions require us all to participate during the week when they are active, no make-up or late credit will be allowed for discussion participation. I understand that unexpected things can come up, so the late-work policy for our course is outlined below.

Serious Emergencies: For serious emergencies, your instructor will decide whether your late work may be accepted for full or reduced credit. Serious emergencies include things like serious illness, accidents, natural disasters, and university server outages. E-mail your instructor the information about your emergency and request approval to make up the assignment, lab, quiz, or exam. If you receive approval, make up the work according to the plan you and your instructor set.

All Other Unexcused Late Work: Unexcused late work includes coursework that is turned in late because of things like job-related, technical, or other personal issues. Your instructor will decide whether your late work may be accepted. A per-day late penalty of 10% of the assignment for an assignment that is one day late (including weekend days). Assignments that are more than one day late will receive an automatic zero. Due to the requirements involved in grading a project, assignments must be in on time.

The COVID-19 One-Free-Pass Option.
Because of the many challenges presented by the ongoing COVID-19 pandemic, I also offer one "free" pass for a late quiz or test. Only once during the semester can you request a waiver and

take *one* of these scored assignments up to two weeks late without presenting a verifiable excuse.

Submission of Assignments

Students are expected to complete all assignments. Failure to submit any assignment will result in ***a zero on that assignment.*** *If homework solutions are shared with the class, your instructor reserves the right to decline to accept late work after the sharing of the solutions or to require that an alternative assignment be completed if one is available. Only one unexcused, non-emergency late submission will be allowed per student per course. (See the above policy.)*

Submission of Materials

Written assignments will be submitted electronically *only and in the appropriate folder on D2L*. Any student file submitted electronically that does not meet the requirements listed will not be graded. Please ensure that files are

- appropriately named (last name(s)-Document title-date). (Do not simply label your paper "Animal Kingdom Paper." I may get up to 24 documents with that same title!)
- submitted in Microsoft Office format (e.g., .doc, .xls., .ppt),* and
- submitted to the corresponding Dropbox folder.

While you are not required to use Microsoft Office products, please ensure your productivity applications are able to import/export into compatible file formats.

Project 1: Topic/ Book Report

There is so much in the animal kingdom that we will not have time to cover all its facets. So, I will be assigning students to teams of 2-3 people to present a report on one of the topics and books. Each team will prepare a PowerPoint presentation to share with the class and summarize their finding on the topic in a short paper. *The paper should be no more than four pages (maximum), double space, 12pt font with one-inch margins. Anything over this limit or any attempt to cheat by single or 1.5 spacing will not be graded and receive a zero.* Concise, straightforward writing is one of the most sought-after skills in the sciences. I am willing to meet with you to help, but first, run your paper through a spelling and grammar check set on a "formal or technical" academic style. Proof each other's work—and please, don't repeat the same materials in each person's section. I know that people subdivide the work in books, but please coordinate when it comes to the writing. (A great way to do this is to do presentations to each other before you begin to write.)

All books are available in Audiobook and Kindle format on Amazon unless otherwise stated. Some are available for free through the Chicago Public Library and some suburban libraries through Hoopla. I have noted these.

Project Books: The books I chose for the book review are fun. I hope they give you a taste of popular science writing, a broad field that needs good writers. No more than three to a book. The topics to explore are:

1. ***Mama's Last Hug: Animal Emotions and What They Tell Us about Ourselves.*** by Frans De Waal (2019) I SBN-13 : 978-0393635065. Explores the world of the often tabooed topic of animal emotions.

2. ***Evolution's Rainbow: Diversity, Gender, and Sexuality in Nature and People.*** by Joan Roughgarden. ISBN-13 : 978-0520280458. Although this book has some flaws, its contents remain interesting as it re-evaluates traditional ideas about animal gender in light of modern biology. An excellent choice for anyone interested in gender and sexuality.

3. ***Six-Legged Soldiers: Using Insects as Weapons of War.*** by Jeffery A. Lockwood. ISBN-13 : 978-0195333053. Human cruelty knows no bounds. In this disturbing book, the author explores the history of insects as weapons of war, from ancient Rome to modern bio-terrorism.

4. ***An Immense World: How Animal Senses Reveal the Hidden Realms Around Us.*** by Ed Young. ISBN-13 : 978-0593133231. This book explores the umwelts in the animal kingdom, i.e., the ways organisms perceive their surroundings. From snakes that sniff in stereo to clams that use vision like we use touch, the diversity in perception will astound you.

5. ***A Wing and a Prayer: The Race to Save Our Vanishing Birds*** *by* Anders Gyllenhall et al. ISBN-13 : 978-1982184551; **AND** ***Endless Forms: The Secret World of Wasps.*** by Seirian Summer. ISBN-13 : 978-0063029927. These two shorter books explore our winged friends. The first discusses the rapid decline in birds. The second examines the biodiversity of wasps, probably the most misunderstood and disliked group of insects. (Not all species sting and most are not aggressive. As is usual, a few bad actors spoil everyone's reputation.)

Remember: The book you choose should act as your starting point and inspiration. It does not have to be your only source or stopping point.

Project 2: The Insect Collection

During the summer or fall sections of this class, students are expected to collect about 50-75 different insects and to classify them to order, with a handful classified to family. If you get your classification wrong, you will lose points.

You will catch 50-75 different insects, then label and identify different insects to order (and some to family) using the key that you purchased for this class AND additional keys provided by me. To pass, you must be able to correctly collect and label multiple orders and several of these to family.

You may identify and receive credit for identifying up to 20 insects to family for points.

However, if you get the information wrong, you will lose points. Although you will need to identify some families to get a good grade, it is counterproductive to try to identify too many. You get more points for orders than for families, so concentrate on collecting as many different orders as possible. You gain points only once for each order or family you collect, but you can lose points each time you get one wrong.

Points will also be awarded for proper curation. These points are a significant part of your total
score. Curation includes proper pinning, specimen condition, proper preservation, wing-spreading/descaling (for Lepidoptera), presentation, and adherence to systematics when ordering
the specimens. (If I have to hunt your collection to find doubles, you will also lose points.)

You may have up to five non-insect arthropods (in vials) for partial credit.

I expect to be kept in the loop as you collect your specimens. Do not wait to ask me how to key something! As the due date approaches, I become swamped, and you will get less individualized
attention due to time constraints. Pinning should be done using a pinning block, and work should be done under a dissecting scope. Therefore, all pinning and labeling must be done at school. You may exchange specimens freely with class members, and you may help each other identify specimens using the dichotomous key. Just give them credit by citing them and giving their collection information on your pins. I do not worry about who collected which specimen, *but the collection data itself is critical to the value of any collection*!

DO NOT USE IMAGES ON THE NET AS YOUR GUIDE. THERE IS MUCH CONVERGENCE IN THE INSECT WORLD. USING AN IMAGE WITHOUT CHECKING YOUR WORK WITH A DICHOTOMOUS KEY IS THE KEY TO FAILURE.

If you cheat on the insect collection, you will fail the class in full. If I find
anyone has purchased any insects for their collection, failure with a zero is automatic.

When curating your collection, check with me early and often. Although there are many ways to
express oneself in science, insect curation is not among them! Museums have developed strict rules for curation and display. Part of your assignment is to learn how to follow these set directives.

Final Examination Schedule Fall 2024

Fall 2024 - Final Exam Schedule

Examination Periods	Tuesday, December 10, 2024	Wednesday, December 11, 2024	Thursday, December 12, 2024
	Class Time During the Term	Class Time During the Term	Class Time During the Term
8:00-9:50 a.m.	9:25-10:40 a.m. TR	8:30-9:20 a.m. MWF	8:00-9:15 a.m. TR
10:00-11:50 a.m.	12:15-1:30 p.m. TR	9:30-10:20 a.m. MWF	10:50-12:05 p.m. TR
12:00-1:50 p.m.	12:55-2:10 p.m. MW	10:30-11:20 a.m. MWF	8:00-9:15 a.m. MW
2:00-3:50 p.m.	1:40-2:55 p.m. TR	11:30-12:20 a.m. MWF 11:30-12:45 p.m. MW	2:20-3:35 p.m. MW
4:00-5:50 p.m.	4:15-5:30 p.m. TR 4:15-6:55 p.m. T	4:15-5:30 p.m. MW 4:15-6:55 p.m. M	4:15-6:55 p.m. R
6:00-7:50 p.m.	5:40-6:55 p.m. TR	5:40-6:55 p.m. MW 4:15-6:55 p.m. W	7:05-8:20 p.m. MW 7:05-9:45 p.m. W
8:00-9:50 p.m.	7:05-9:45 p.m. T 8:30-9:45 p.m. TR	8:30-9:45 p.m. MW 7:05-9:45 p.m. M	7:05-8:20 p.m. TR 7:05-9:45 p.m. R

Final examinations for **Saturday** classes: **Saturday, December 14, 2024** at the same time and place as class meetings during the term.
Final examinations for **Friday** only classes: **Friday, December 13, 2024** at the same time and place as class meetings during the term.