Course Information

Instructor: Dr. Tanya Dewey
Department of Biology
Office: Biology Room 404
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Office Hours: Wednesdays 10 to 11:30 a.m. and by appointment

Communication:
Questions requiring extended replies or explanations cannot be answered by email. Please see your GTA, come to office hours, or make an appointment for detailed discussions. I will make every attempt to respond within 1 business day. Please make sure that your Canvas settings allow you to receive prompt notification of announcements so that I can use that as a tool to send important reminders and clarifications to all in the class.

Textbooks and Course Materials:
1. Readings: There is no textbook for Systematic Zoology. Instead there will be assigned readings each week. Please review the suggested readings, videos, etc. on Canvas one week ahead of time!
2. Canvas Site: A Canvas site has been set up for this class. Registered students will be automatically provided access. Play close attention to the site for resources and announcements.

Course Objectives:
BZ424 is a course designed to provide an introduction to the core principles of systematic zoology and explore in depth the many biological issues that are part of the field, including issues of species concepts, speciation, taxonomy and classification, constructing and evaluating hypotheses of evolutionary relationships, characters used in taxonomy, species descriptions, the taxonomic literature, museums and museum science, and careers in systematic zoology.

Grading Policy:
Your grade in the class will be based on the following:
  • Exam I – 100 pts
  • Exam II – 100 pts
  • Exam III – 100 pts
  • Taxon Account – 100 pts
  • Participation / Attendance – 75 pts
  • Assignments (Library Exploration, Notes from Nature Badge, Dissection of a Taxonomic Description, Genbank Search, Multiple Sequence Alignment, Cladistic Analysis, Primary Literature Analysis, etc.) – 95 pts
  • Ignite talk on Taxon Account – 30 pts

Exam day: Exams will take place during a regularly scheduled class day. The format will be mostly short answer questions. Students are expected to adhere to CSU academic integrity policies.
Students with Disabilities: Students who need special accommodation should contact me as soon as possible to discuss the request, no later than one week before an exam or assignment due date. Students seeking accommodation in general for exams should contact the Office of Resources for Disabled Students.

Class Schedule: The estimated schedule for course topics covered in lecture is found below. Please note: there may be changes in the schedule as we accommodate your interests and the schedules of several guest speakers! Again – keep your eye on Canvas and be aware of announcements made in class! In class exams will be held on February 16, March 30, and May 4.

Tentative schedule for the semester

Week 1: What is Systematics?

January 17 - Introduction to the Class and the Animal Diversity Web
January 19 - The Science of Systematics

Week 2: The Science of Taxonomy

January 22 - Taxonomy
   Due: Register in the course workspace on the ADW
January 24 - Searching the Taxonomic Literature - Important Note: Meet in Morgan Library Classroom 175
January 26 – Tree Reading

Week 3: Species Concepts

January 29 – Intro to Species Concepts
   Due: Submit taxon name and a list of at least 10 literature sources.
January 31 – Problems with Species Concepts
   Due: Library Exploration Homework.
February 2 – In class Discussion - Species Concepts Readings

Week 4: Speciation and Taxonomic Decisions

February 5 – Speciation and Gene Flow
   Due: Diversity, Geographic Range, and Habitat sections
February 7 – Infraspecific Classification
February 9 - In class Discussion - Primary Literature Analysis I

Week 5: Principles of Classification

February 12 – History of Classification
   Due: Physical Description and Reproduction sections
February 14 – Systematics and the Future of Biology
February 16 - In-class Exam I

Week 6: Zoological Nomenclature and Taxonomic Publication

February 19 – Zoological Nomenclature
Due: Lifespan/Longevity, Behavior, Communication and Perception sections
February 21 – Taxonomic Publication – History and Future
February 23 - In-class Exercise: Dissect a Taxonomic Description

Week 7: Taxonomic Characters

February 26 – Taxonomic Evidence
Due: Food Habits, Predation, and Ecosystem Roles sections
February 28 – Character Transformations
March 2 - In class Discussion - Primary Literature Analysis II

Week 8: Schools of Phylogenetic Thought

March 5 – Cladistics and Phenetics
Due: Economic Importance for Humans: Positive, Economic Importance for Humans: Negative, and Conservation Status sections
March 7 – Using Models of Evolution
March 9 - In class Discussion - Primary Literature Analysis III

Week 9: Spring Break!! (March 12 to 16)

Week 10: Phylogenetic Methods

March 19 – Maximum Parsimony
Due: Other Comments section
March 21 – Maximum Likelihood
March 23 – Bayesian Statistical Approaches

Week 11: Molecular Systematics - Data, Alignments, Assumptions

March 26 - Data, Alignments, Assumptions
Due: Notes from Nature Badge
March 28 - In class Exercise: GenBank Searches and BLAST
March 30 - In-class Exam II

Week 12: Molecular Systematics - Generating and Testing Hypotheses

April 2 – Trees as Hypotheses
April 4 – In class Exercise: Multiple Sequence Alignment and Generating Topologies
April 6 – (Possible guest lecture)

Week 13: Molecular Systematics - Generating and Testing Hypotheses

April 9 – Support for Branching Topologies
   Due: Second draft of complete taxon account for peer review.
April 11 – Combining Data Types
April 13 – In class Exercise: Support Metrics and Total Evidence
   Due: Cladogram Interpretation Narrative

Week 14: Characterizing Populations and Recent Evolutionary History

April 16 – Taxonomic Sampling
   Due: Peer review comments on second draft of complete taxon account.
April 18 – Dating Nodes
April 20 – Coalescent Modeling and Species Delimitation

Week 15: Museums

April 23 – Museums – Collections and Curation
   Due: Submit final complete taxon account.
April 25 – Museums – Historical and Future Scientific Discovery
April 27 - Field Trip to C.P. Gillette Museum of Arthropod Diversity

Week 16: Conclusions: Extinctions and De-extinction?

April 30 - Extinction, de-extinction, and reintroductions
   Due: Ignite talk videos - what is the coolest thing about your taxon and what
   would happen to the world without it? (In under two minutes.)
May 2 - Ignite talks!
May 4 - In-class Exam III