Biology 376/576, Herpetology, Spring 2022

Course overview

Faculty	**Peter A. Zani, Ph.D.**
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Lecture	**Tuesday and Thursday 10:00-10:50 CBB 165**
Lab	**Wednesday 2:00-5:00 TNR 400**
Additional Help Hours	**In lecture or by Zoom appointment as needed**

Course description

This course introduces you to the biology of reptiles and amphibians. We will explore the diversity of herptiles, their evolutionary history & diversification, as well as unique biological aspects of these organisms. This course utilizes a flipped classroom in which content is online and in-person meetings are used for additional discussions of the material. The goal of in-person meetings is not to introduce new ideas, but to answer questions related to the ideas raised in the on-line lectures.

Course goals

Upon completion of this course you should be able to:

Explain the evolutionary history of reptiles and amphibians in the context of all major vertebrate groups.
Compare and contrast similarities and differences of herptiles in terms of their adaptations to life on Earth.
Locate and concisely summarize relevant scientific literature on topics related to reptiles and amphibians.
Identify, analyze, and communicate graphically & in writing patterns present in biological datasets.
Define the levels of biological organization by identifying the herp species of Wisconsin, the genera of the United States, and the major families and higher taxa of the world using **proper scientific nomenclature**.
Describe the levels and types of herp diversity in Wisconsin, the United States, and throughout planet Earth.

Course readings

Required texts

- Herpetology: An Introductory Biology of Amphibians and Reptiles 4th Ed. by L. J. Vitt & J. P. Caldwell

I suggest you read the assigned pages prior to lecture & then review those pages again after class.

Course evaluation:

Your grade in this course will be based on the following components totaling 500 pts:

In-lab Taxonomy Assignments (as group)	Lab Practical Exams (as individual)	Project Assignments In Lab (as group)	Project Final (as individual)	Lecture Exams	Final Exam
100 (20 pts. each)	100 (50 pts. each)	50 (10 pts. each)	50	100 (50 pts. each)	100 pts.

Lectures/Exams

Reptiles and amphibians continue to be model organisms for many areas of biological investigation. In lecture, we will discuss many of these aspects of herptiles including their evolutionry history. Almost all of the diversity component of this course will be restricted to lab, which means that lectures will focus on aspects of herptiles that make them unique and interesting biological entities

Material presented and discussed in lecture is fair game for exams (lab material will not appear on exams). There will be two lecture exams at roughly equal intervals that sum to 20% of your grade. There will also be a comprehensive take-home final exam worth 20%. In-class exams will not be comprehensive, though the material does build throughout this semester. Exam questions will consist of a few multiple-choice and matching, but will mostly be short-answer or longer essay-type questions. Exams are meant to test your comprehesion of the material and reasoning ability and not *JUST* your ability to memorize static factoids.

Labs, Practicals, & Projects

Labs will be split between a focus on herpetological taxonomy/nomenclature and on scientific investigation using biological datasets. These roughly fall into first-half vs. second-half semester components.

Labs the first half of the semester will focus almost exclusively on taxonomy and identification moving from higher to lower taxa. ***You are responsible for the identification of reptile and amphibian species of Wisconsin, genera of the United States, the major families of the world, and select higher taxa.*** Identification will utilize scientific nomeclature as recognized by the Center for North American Herpetology (cnah.org). ***Be sure you know the proper rules for scientific nomenclature*** (binomial, in Latin [therefore underlined], with captialized genus [but not specific epithet] name; higher taxa are capitalized and with rank-specific suffixes). Failure to follow proper naming rules will result in loss of half credit for **EACH** name not correctly presented.

To facilitate your lab experience, I recommend that you review your text (Vitt and Caldwell [part VI]) pertaining to that week's groups as well as review audio-visual presentations on Canvas on that taxonomic rank PRIOR to lab (see schedule below) and focus on the distinguishing traits among taxa. Word of warning: if you do not prepare ahead of time the labs are likely to have less meaning and be more difficult for you, which means your grade will suffer. In lab there will be a **group** exercise focusing on that week's taxonomic rank due by the end of lab (10% of your grade). Two **individual** lab practical examinations (20%) will test your understanding and knowledge of higher and low taxonomy, respectively.

Labs for roughly the second half of the semester will be dedicated to data analysis and interpretation group projects. General project topics will be chosen by me, but each group will have an opportunity to explore these based on your group's interests. The general goal is to learn how to use numbers (data) to ask and answer biological questions. Following an introduction to general methods, including statistical analyses, projects will involve your editing and proofing a database to acquire a working dataset, then analyzing data from this dataset statistically, as well as creating relevant figures to communicate your findings. Each of these will have an in-lab assignment for each **group** focused on the research projects (in-lab group assignments sum to 10% of your grade). The final project assignment is for you to produce **individually** a written results statement that identifies the hypothesis you were testing and the results of your investigations with graphical support for these statements as well as a statement of context using the scientific literature as support (individual final lab assignment is 20% of your grade).

Final Grades

Your final grade is based on the percentage of points that you earn.

≥93% = A, ≥90% = A–, ≥87% = B+, ≥83% = B, ≥80% = B–, ≥77% = C+, ≥73% = C, ≥70% = C–, ≥67% = D+, ≥60% = D, <60% = F

Academic Honesty

Plagiarism and cheating are serious offenses and may result in an F for the assignment, the course, or expulsion from the university. The details of the UWSP Academic Integrity policy are found in the Student Handbook. It is your responsibility to read and understand the contents of that policy before you submit work to be graded. Questions regarding policies and enforcement of policies may be addressed during office hours.

Notification of Participation in College Sanctioned Events

Participants in college-sanctioned events must notify me in advance and plan on completing any work, including tests, in advance. It is your responsibility to communicate with me in advance regarding *any* absences.

Concerning Disabilities

UWSP abides by the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 that stipulates no student shall be denied benefits of an education "solely by reason of a handicap." Disabilities covered include, but are not limited to, learning disabilities, hearing, sight, mobility or health-related impairments. Please contact me if you have a documented issue that may impact your work for which you require accommodation.

Teaching and Learning in the Era of Coronavirus

These are unusual times in that we are trying to continue teaching-and-learning while a very serious viral epidemic rages globally. Yet, we seek to persevere and overcome this (and any other) challenge. In this case, the challenge is going to be meeting regularly to discuss the topic at hand and actually participating in the process. The work itself you can do on your own, but the meetings will aid you greatly. Thus, while I expect you to keep up with the work, I understand that life (including illness) sometimes gets in the way. The key is open and honest communication. If you cannot attend our meetings I can assign individual work, but this is less ideal in that the group discussions are key to advance your understanding in this class. If you contract Covid-19, the disease caused by the novel coronavirus, I will make every attempt to pause the due dates on any assignments and allow for make-up work as needed. If something happens and you cannot meet, please try to let me know in advance so I can adjust as needed. So, am I flexible? Absolutely. Do I still have expectations for your education in this course? Absolutely. The key is, I am willing to work with you to ensure that you can master the learning outcomes of this course in a reasonable manner. Carry on, and be safe.

Spring 2022
Biology 376/576
Herpetology

Class Schedule (this schedule is tentative)

Wk	Day	Date	Lecture Topic	Chpt	Lab Topic
1	T	Jan. 25	Intro to Herpetology		Herp Morphology and Anatomy (20 pts)
1	R	Jan. 27	A Brief History of Herpetology	1	
2	T	Feb. 1	From Fish to Amphibian	3	Higher taxonomy: Classes & Orders (20 pts)
2	R	Feb. 3	From Amphibian to Anthracosaur	3	
3	T	Feb. 8	From Reptile to Mammal & Archosaur	3	Higher taxonomy: Families & non-WI Genera (20 pts)
3	R	Feb. 10	Cranial Anatomy	2	
4	T	Feb. 15	Post-cranial Anatomy	2	Lower taxonomy: Wisconsin Genera (20 pts)
4	R	Feb. 17	Reproductive Cues and Responses	4,5	Review for exam: higher taxa
5	T	Feb. 22	Reproductive Life Histories & Modes	5	**Taxonomy Practical I:** (50 pts)
5	R	Feb. 24	Reproductive Behavior	4	**Higher Taxa and non-Wisconsin Genera**
6	T	Mar. 1	**EXAM #1** (50 pts)		Lower taxonomy: Wisconsin Species (20 pts)
6	R	Mar. 3	Gas Exchange & Respiration	6	
7	T	Mar. 8	Maintaining Water Balance	6	Review for exam: lower taxa and Wisconsin sp.
7	R	Mar. 10	Temperature Regulation	7	
8	T	Mar. 15	Locomotor Performance & Energetics	7	**Taxonomy Practical II:** (50 pts)
8	R	Mar. 17	Seasonal Thermobiology	7	**Wisconsin Genera and Species**
9	T	Mar. 22	**SPRING BREAK**		
9	R	Mar. 24	**No classes**		
10	T	Apr. 5	Social Behavior & Spacing	8	Project Background: Hypothesis testing & literature
10	R	Apr. 7	Migration & Orientation	8	Plans due by end of lab (10 pts)
11	T	Apr. 12	Mechanisms of Communication	9	Project Data: Outliers and data summaries
11	R	Apr. 14	Mating Systems	9	Data histograms due by end of lab (10 pts)
12	T	Apr. 19	Foraging Ecology	10	Project Analyses: Descriptive vs. analytic statistics
12	R	Apr. 21	Dietary Ecology	10	Descriptive summaries due by end of lab (10 pts)
13	T	Apr. 26	**EXAM #2** (50 pts)		Project Figures: Illustrating data with bivariate plots
13	R	Apr. 28	Defense Strategies	11	Draft bivariate plots due by end lab (10 pts)
14	T	May 3	Crypsis & Escape Behavior	11	Project Context: Peer review of draft results section
14	R	May 5	Ecological Patterns	12	Annotated bibliographies due end of lab (10 pts)
15	T	May 10	Community Ecology & Diversity	12	**Project Finals: Individual data interpretation**
15	R	May 12	Biogeographic Patterns	13	Final results section and figures due (50 pts)
	F	May 20	**Take-Home Final** (100 pts)		**Due at 12:00 pm**