

WFS 433/533
AMPHIBIAN ECOLOGY AND CONSERVATION
Spring 2019

- Instructor:** Dr. Matthew Gray (*mgray11@utk.edu*)
- Teaching Assistant:** Daniel Malagon (*dmalagon@vols.utk.edu*)
- Office:** 247 Ellington Plant Sciences Building (PSB), 974-2740 (MG); 201 PSB (DM)
- Website:** <http://fwf.ag.utk.edu/mgray/wfs493/493home.htm>
- Time & Place:** T, Th 8:10 – 9:25 p.m., 160 PBB (2 field trips required: see page 3)
- Course Credits:** 3 credits
- Required Text:**
- The Ecology and Behavior of Amphibians, 2007 (ISBN 9780226893341)
 Author: Kentwood D. Wells (*available online: <http://www.lib.utk.edu>*)
 - The Amphibians of Tennessee (<http://utpress.org/>)
 Authors: Matthew Niemiller and R. Graham Reynolds
- Journal Papers:** Occasionally journal papers or chapters from other books will be assigned instead of or to supplement the required text. These will be provided in class or on the website.
- Course Goal:** To expose students to the life history, diversity, ecology, conservation, and management of amphibians through a combination of lectures, readings, class discussions, and field experiences.
- Expected Outcomes:** Students that successfully complete WFS 433/533 will have a basic understanding of amphibian identification (larvae and adults), physiology, life history, and ecology. They will be aware of potential mechanisms of amphibian declines, understand how to sample amphibians, and be aware of conservation strategies.

Weights of Academic Assessments:

WFS 433		WFS 533	
• Test #1	25%	• Test #1	20%
• Test #2	25%	• Test #2	20%
• Test #3	25%	• Test #3	20%
• Amphibian ID Exam	15%	• Amphibian ID Exam	10%
• Participation ^{1,2}	10%	• Participation ^{1,2}	10%
		• Lecture ³	20%

¹Participation includes attendance during two field trips; students will earn 5% for attending each field trip.

²If you miss a field trip, you can either: (1) attend the Southeast PARC meeting (1 day), (2) write a 10-page scientific paper on an amphibian topic of your choice (see page 2), or (3) accept the 5% deduction in your final grade.

³Graduate student lectures will be 25-35 minute presentations on an approved amphibian ecology or conservation topic. Topics must be approved by 14 February.

Your course grade will be determined using the following scale:

Grade	Final Weighted Percent		Grade	Final Weighted Percent
A	90 – 100%		C	70 – 76%
B+	87 – 89%		D	60 – 69%
B	80 – 86%		F	<60%
C+	77 – 79%			

Extra Credit:

You can positively influence your grade as much as **4.5%** by volunteering for extra credit. Volunteer work must be related to herpetofauna, and can include work on university projects, with government agencies, or NGOs. For every **8 hours** of volunteer work, your final grade will be increased by **1.5%** up to **4.5%** (24 hours total). All volunteering must be completed by **3 May 2019**. A volunteer form (see website) must be filled out by the supervising individual. Scott Dykes (scott.dykes@tn.gov), Chris Ogle (Chris.S.Ogle@tn.gov), and Chris Simpson (Chris.Simpson@tn.gov) with TWRA are often looking for volunteer assistance. You also may participate in TAMP surveys (organized by the UT Student Chapter of The Wildlife Society); 17 Jan coordination meeting.

Extra credit also can be earned by attending the Annual Meeting of the Southeast Partners in Amphibian and Reptile Conservation (<http://separc.org/meetings/>). The meeting is 14 – 17 February at the YMCA Blue Ridge Assembly in Black Mountain, NC. Your final grade will be increased by **0.5%, 1.5%, and 1.5%** for participating in the meeting on **14, 15, and 16 Feb**. Transportation will be provided (entire meeting attended). Registration (\$30 for students) is required. Lodging and meal options vary (\$185 – \$377 for three nights), and reservations can be made at <https://blueridgeassembly.org/separc-annual-meeting-2019>. If you go for the entire meeting, UT van transportation will be provided, but you need to sign up by **29 Jan**.

NOTE: A maximum of **4.5%** can be earned in extra credit in WFS 433/533.

Scientific Paper: (Make up for Missed Field Trip) DUE: 25 April 2019 or before

Choose an amphibian topic of interest (related or unrelated to a lecture topic) and write a ≥ 10 -page paper. The title page and literature cited are not included in the length requirement and over $\frac{1}{2}$ of the 10th page must have text. The paper must be written scientifically and include ≥ 5 non-internet references (e.g., journal article, book chapter). The style of headings, in-text referencing, and the literature cited format must follow the *Journal of Wildlife Management* (Volume 70[1]:304-320). Your paper must be double-spaced using 10- or 12-pt Times New Roman font with 1" margins.

ADA Accommodation:

Any student who, because of disability, may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make such accommodations as may be necessary.

Religious Holy Day Observance:

A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence IF, no later than the FIFTEENTH day after the first day of the semester (i.e., 1/24/19), the student has notified the instructor of each scheduled class that the student would be absent for a religious holy day.

Tentative Schedule: WFS 433/533

Month	Day	Topics ¹	Instructors ²
January	10	Introduction and TN Anuran ID	Gray*
	15	TN Anuran ID	Gray*
	17	TN Salamander ID <i>TAMP Workshop (5 – 6 pm) – not required</i>	Sutton (TSU)* Gray
	22	Evolution: From Fish to Frogs	Hardman (UTK)
	24	Amphibian Phylogenetics and Biodiversity	Pierson (UTK)
	29	Amphibian ID Exam	Gray*
	31	Amphibian Anatomy and Physiology	Malagon*
February	5	Amphibian Immunology <i>(Return ID Exam) – meet at 8:30 am*</i>	Rollins-Smith (Vanderbilt)
	7	Amphibian Microbiome	Woodhams (UMass)*
	12	Exam #1: Amphibian Evolution & Physiology	Gray*
	14	Invasive Buckthorn and Amphibians SEPARC Meeting: Asheville, NC	Brenes (Carroll Univ)*
	19	Salamander Courtship <i>(Return Exam #1) – meet at 8:30 am*</i>	Hamed (VHCC) Gray/Malagon*
	21	Amphibian Reproductive Strategies	Malagon*
	26	Anuran Courtship Amphibian Parental Care	Gray* Pierson (UTK)
	28	Predation, Estivation, Hibernation TN-TWS Meeting: Gatlinburg, TN	Lituma and Hockman
March	5	Amphibian Movements & Habitat Connectivity	Titus (Green Mnt)*
	7	Phenotypic Plasticity	Hoverman (Purdue)
	12	WFS 533 Presentations	Grad Students*
	14	Lecture Exam #2: Amphibian Ecology	Gray*
	19, 21	Spring Break	No Class
	26	Amphibian Sampling Techniques eDNA Sampling <i>(Return Exam #2) – meet at 8:30 am*</i>	Graeter (NCWRC) Pierson (UTK) Gray/Malagon*
	28	Amphibian Declines	Gray*
	30 (Sat)	Great Smoky Mountains Field Trip <i>(leave at 8:00 am)¹</i>	Gray and others*
April	2	Toxicology	Kerby (USD)
	4	<i>Batrachochytrium dendrobatidis</i> Ranaviruses	Voyles (UNR) Gray*
	9	<i>Batrachochytrium salamandrivorans</i>	Gray Lab*
	11	Climate Change	Rohr (USF)
	12 (Fri)	Pond/Vernal Pool Sampling Trip <i>(leave at 2:00 pm)¹</i>	Gray and others*
	16	Conservation and Management of Amphibians	Gray
	18	Salamander Conservation	Walls (USGS)*
	23	Disease Intervention Strategies	Woodhams (UMass)
	25	Zoological Facilities in Conservation	Herman (Indoor Ecosystems)
May	3 (Fri)	Lecture Exam #3: Amphibian Conservation (8:00 –10:00 am in 160 PBB)	Malagon*

¹University transportation will be provided for the Great Smoky Mountains and pond sampling field trips.

²An “*” indicates live lecture – all others will be recorded and posted to the iTunes site for the course.