BIOS4471 BEHAVIORAL BIOLOGY SUMMER 2022

Essential Course Details:

All Class and Office Hours Links are on Canvas
Lecture: MWF 9:30am-12:15pm EDT on Zoom
Course Instructor: Dr. Emily Weigel (she/her) emily.weigel@biosci.gatech.edu
Note: when sending an email, please put BIOS4471 in the subject line
Office Hours: Wednesdays 8:00-9:00am (before class) & by appointment

Course TAs:

- Melody Modarressi (she/her) mmodarressi3@gatech.edu; **Office Hours:** Thursdays 10-11am
- Emily Skibinski (she/her) eskibinski3@gatech.edu; **Office Hours:** Tuesdays 1-2pm
- Ling Zhu (she/her) lzhu95@gatech.edu; **Office Hours:** Mondays 4-5pm

1.0 Course Description:

This course is an introduction to the study of the principles of behavior of all kinds of organisms, from microbes to mammals. We will examine basic principles derived from evolution, ecology, ethology, and development, and use these principles to explain how and why organisms behave as they do. In this course, we will learn how animal behavior is studied and how hypothesis testing is applied to key topics in animal behavior. We will focus on many important biological activities, such as foraging, communication, social behavior, predator-prey interactions, mating, and parental care. The general goal of the course is to develop the ability to think as a scientist. By the end of this course you should be able to identify an interesting scientific question, determine how it could be studied, and critically evaluate existing evidence to answer it.

Prerequisites: Successful completion of BIOL1510/1511/1520/1521 OR BIOS1107/1108/1207/1208 is required to enroll in this course. BIOS 2300 and/or 3600 recommended.

2.0 Required Resources:

1. Animal Behavior: Concepts, Methods, and Applications, **Second Edition**
   Shawn Nordell and Thomas Valone
   Paperback ISBN: 978-0190658717

2. Dr. Tatiana's Sex Advice to All of Creation
   Olivia Judson
   Paperback ISBN: 978-0805063325

3. Subscription to Learning Catalytics, purchased at lcatalytics.com

4. Webcam/video-streaming and microphone/audio-streaming device(s) to facilitate class participation

Other materials will be made available via Canvas.

3.0 Learning outcomes:

By the end of this class, students will be able to:

1. Demonstrate how evolutionary and ecological processes shape behavior
2. Explain how genetic, developmental, and physiological systems interact and affect behavior
3. Design and implement experiments to test behavioral hypotheses
4. Distinguish between proximate and ultimate causes of behavior
5. Explain concepts that explain behavioral differences within and between species.
6. Effectively communicate scientific findings concerning behavior in both oral and written modes
7. Read, interpret, and explain primary literature that concerns behavior

8. Generate testable hypotheses based on observations of animal behavior and make predictions based on those hypotheses.
9. Engage in graph interpretation, appropriate graph choice & construction of experimental data
10. Conduct an independent search of current scientific literature on animal behavior

4.0 Class Format:
Although we will be online, this class will NOT simply consist of a series of PowerPoint presentations. This is not because we're technologically inept, but rather, studies show that you don't learn much that way (Ok, we know you're thinking that you're the exception, so here are a few sources: Hake (1998) American Journal of Physics, Klymkowsky et al. (2003) Cell Biology Education). So, instead of this being a class where you can expect to sign in, sit back, let us do all the talking, download the slides after class, and skim through the required reading the night before the test, you CAN expect that most of our class meetings will revolve around small group activities such as case studies and data analysis, and basically lots of you talking and listening to each other. This is because the ultimate goal of this class is for you to truly understand the fundamental concepts of animal behavior.

5.0 What is your role as a student?
Before class, read/watch/listen to the assigned preparatory material, complete work outside of class, and formulate any questions you want to ask. During class, you can expect to build your understanding through activities and class discussions.

This course format will ask you to develop skills in identifying what information you need, and learning how to break down a problem into achievable parts. Key attributes of A-level class participation include (based on rubric by Filipe and Pritchett 2013):

- Actively looking for and recognizing inadequacies of existing knowledge,
- Consistently seeking and asking probing questions,
- Using advanced and persistent search strategies,
- Evaluating solutions by assessing reliability and appropriateness of sources.

6.0 Assessment:
You will be assessed by your performance on various in-class assignments (Participation), Learning Catalytics (LC) assessments, an 'essay' project, and on three (3) unit exams.

Assessment type	Number of assessments	Percent of your final grade
In-Class Participation	Minimum of 12 full classes out of the whole semester*****	10%
LC Assignments (IKEs and Homeworks)	10	10%
Dear Dr. Essay	1	20%
Take-Home Exam 1	1	20%
Take-Home Exam 2	1	20%
Take-Home Exam 3	1	20%
	TOTAL	100%

This is summer, and although you may not be traveling, I realize many of you may have various demands on your time. As long as you stay up on the assignments/exams, it is ok if you can't attend a class or two. Please, however, sign in on time to class when you intend to be there. There will often be important instructions at the start of class, and arriving late means you'll miss out/delay the class!

7.0 Grades:
This course is graded on a straight scale – *you are not competing against anyone else for your grade*. The most stringent scale used will be: 90.0-100% an A, 80.0-89% a B, 70.0-79% a C, 60.0-69% a D, and <60.0% F.

8.0 Grade Change:
Grades are not negotiable commodities. However, mistakes can and do occur. If you feel a writing assignment or exam has been incorrectly scored, notify Dr. Weigel directly *by email* as soon as possible. Any requests for adjustment of grades must be submitted in writing no more than 48 hrs after the work has been returned and should include a detailed explanation as to what you would like us to review. In all cases, and in a manner consistent with the syllabus policies, the entire assignment will be reevaluated and a final, revised grade (higher or lower) will be assigned if warranted.

9.0 Attendance and Participation:
The rationale: This class is intentionally synchronous, as it gives you the opportunity to dive deep into behavior and to discuss with classmates and professional biologists. Additionally, as behavioral biology is conducted by measuring the state of an organism at a given timepoint, we will treat class as we do observations of animals in the wild: you can't ask a monkey to 'go back and do it again', so in that same spirit, what you miss from class, you have simply missed. And lots of missing or poor data does not make good for science. As recordings can't do class justice, it is your responsibility to attend class, ready to learn and contribute. Your educational experience is much enriched by the classroom experience, far beyond what you can learn from just reading and writing in solitude and passively watching things; take full advantage of our time together.

The details: In-class assignments administered through LC or other venues, as well as active discussion during class, will determine your participation credit for the day. You will receive a score (0 or 1) based on your successful completion of assignments AND active discussion in class; this means you must be present and actively engaged to earn credit. Participation is graded out of 12 possible points, although there are more than 12 sessions in the course, so it is possible for you to potentially miss a class or two without damaging your participation grade, although we do not advise missing any courses due to the documented negative impact on exam scores.

Note that attendance does not directly equal participation; if you are late, leave early, unprepared or off-task, merely being present will not earn you points. Similarly, completion of work outside of engagement in class will not be accepted. Please be aware that completing work done in class, but not being present, in an attempt to earn participation points runs counter to GT's the Honor Code.

10.0 Incoming Knowledge Evaluations (IKEs):
Before each class, you'll complete pre-class reading. Once you've reviewed the material, log in to Learning Catalytics to complete that topics' Incoming Knowledge Evaluation (IKE). IKE sessions close at the start of class and will not be reopened for credit, but you can review closed sessions for study purposes. I'll use your responses to guide what we do in class. IKE questions are not often at the same level as you can expect to see on an exam; instead, they ensure that you come to class with effective baseline knowledge to work up to exam-level understanding in class. These are graded for accuracy.

Learning Catalytics can be purchased directly at https://learningcatalytics.com/users/sign_up. You will need to have an internet-ready smartphone, tablet, or laptop with video and audio capabilities in order to fully participate in class and earn credit for your participation.

11.0 Homeworks:
Homework assignments (HWKs) will be made available each week in Learning Catalytics and are due on Fridays at 5pm. Each HWK will become accessible after we have completed the associated lesson, which means you will have more time to complete lessons earlier in the week (to give you a bit of flexibility), but note that, for the best learning outcomes, you should plan to complete each HWK soon after the lesson. HWKs close at 5pm on Friday and will not be reopened for credit, but you can review closed sessions for study purposes. *These are graded for accuracy.*

12.0 Dear Dr. Essay Assignment:
During the course of the semester, we will not only be learning all kinds of really cool stuff about animal behavior, but we will also be working on our ability to communicate what you've learned to a larger audience. Several years back, Dr. Olivia Judson published a fantastic pop science book about sexual behavior in the animal kingdom called Dr. Tatiana's Sex Advice to All of Creation. In this book, Dr. Judson wrote under the guise of Dr. Tatiana, a kind of Dear Abbey or Dan Savage advice columnist to the animal world, and as this character, she doled out all kinds of fantastic and salacious information about animal sexual behavior in the context of evolutionary biology. It has limitations: namely, it needs updating, and it needs broadening to behavior topics beyond just sex. This is where you come in:

Your assignment this semester will be to write an essay about some kind of non-reproductive animal behavior in the advice column style of Dr. Tatiana (Judson, 2002). The essay should be 5-6 manuscript pages long, plus references; single- spaced, one-inch margins, 12 point Time New Roman or 11 point Arial font. Your essay should be accessible to the average pop science reader while at the same time contain primary literature sources and be well-seated and relatively CURRENT (2010 and more-recent references) within the fields of animal behavior and evolutionary biology. You will receive a detailed assignment and rubric for the essays. Due dates for essay assignments are noted in the weekly breakdown section of the syllabus.

13.0 Exams:
There are 3 'unit' exams in this course. Exams will be mainly short essay with some fill-in-the-blank and multiple-choice questions. The exams will require you to use critical thought to analyze data. That is, exams assess your understanding of concepts and ability to explain and apply those concepts, rather than your ability to memorize facts. Pay attention to the learning objectives and practice activities, as they are direct exam prep.

Note that Take-Home exams will be available online and only available once. That means that once you open your exam, you will not be able to close your exam and open it again. *I repeat, once you start your exam you MUST finish it in that sitting*. Exams should take about an hour and a half to two hours. So, plan on taking your exam when you have that much time to sit and spend writing your exam. Taking exams in this format (open book, open note, at your leisure, in an environment of your choosing) is a privilege based on trust, so please do not give reason for the format to change in response to behaviors that appear to give you an unfair advantage ('cheating'). Cheating includes opening the exam and not finishing it in one sitting, discussing the exam with others, using online forums, as well as plagiarizing or copying and pasting, etc.

14.0 Assignment Submission, Late Assignment, and Missed Exam Policy:
All assignments are to be submitted directly to Canvas or Learning Catalytics. You are responsible for ensuring the timely submission of appropriately-formatted, applicable, openable files; therefore, please check each submission to be sure it appears in the system and in the format you intended *prior to the deadline*. Assignments submitted via email or as linked documents (e.g. google docs) will not be accepted. No make-up assignments or exams will be allowed unless you have an institute-approved absence. We will NOT consider accepting late writing assignments or administer alternative exams unless otherwise noted or arranged at least 24hrs BEFORE the due date.

15.0 Timeliness and Short-semester Courses:
This is a 2hr and 45 min class. We expect you to arrive on time and stay the duration of the class session. Because this is longer than most class times to which you've grown accustomed, we will try to add variety to class and give breaks during our sessions, but remember, this is still a short-summer semester course. We have a lot to accomplish, so the class is going to move at a quick pace and have many deadlines in rapid-succession. We will do our best to be available and return assignments quickly, but please also do your part.

This means staying on top of things and not getting behind; it will be very difficult to catch up. We advise putting your due dates in your calendar now and setting reminders if you are a person who tends to forget.

16.0 Acceptable Behavior/Etiquette Policy:
At Georgia Tech, we believe that it is important to continually strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectations—that you can have of me, and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek in our class.

Please keep in mind, when on campus or not, you represent Georgia Tech, and any guest speakers or access we have to resources can be cut off due to misbehavior. Don't ruin it for everyone! *Additionally, should you request a special appointment for office hours and be late or fail to show, we reserve the right to no longer allow you to schedule individual appointments outside of regular office hours. If you have an unavoidable, unforeseen conflict, please do let us know ASAP, but otherwise plan to make the appointments you set.*

17.0 Email Policy:
Emails can be an appropriate forum to exchange ideas, particularly when addressing individual concerns (e.g., your grade, an institute absence, etc.). When you email, *please put BIOS4471 in the subject line* so we see and prioritize the message. Please also use your GT email; we can respond most thoroughly (and rapidly) when we can simply hit reply vs. needing to search for your verified GT email to respond. *Please also do NOT use Canvas messaging to email; it is not reliable.* We will generally reply well within 24 hrs and be most responsive M-F 8am-5pm ET, but if we reply outside of those hours, unless the concern is urgent (e.g., we're troubleshooting your access to LC, an exam, etc.), please don't feel the need to immediately respond. We all need time off. Please pay us this same respect.

18.0 Piazza and Chat Policy
We encourage asking questions and working together, both in and outside of class. To this end, we will set up Piazza, an online platform for you to ask us and your fellow students questions, and we will enable the chat feature in class. We ask that you first review what others have written before posting (e.g. in case your question has already been asked and answered), and we also ask that you do not post solutions/specific questions to give everyone the chance to do their own work. Please remember that conversations on Piazza and in the chat are not private and are visible to the class, so *please email if your concern is personal (a grade, illness, etc.).*

Important: A challenge with written communication can be in interpreting text without the visual and auditory clues from speech. Please remember that this is an academic course, taught and taken by real people, so we are asking that you treat others with respect. Please grant us and each other grace and the benefit of the doubt in potential miscommunications by asking for clarification when needed, and please respond to requests in good faith. We will strive to keep our learning environment as a place where we can seek knowledge openly, and we will keep Piazza and the chat available as long as this goal is met.

19.0 Tutoring:
Georgia Tech offers a variety of free learning and communications support options. Learn about free tutoring resources at www.success.gatech.edu. For assistance with revising written work, consult the Communications Center (or commlab.gatech.edu).

20.0 Honor Code:
All students are expected to abide by the Academic Honor Code, which can be viewed online at www.honor.gatech.edu. Plagiarism is the unattributed use of the words of ideas of others; plagiarism on any assignment be referred to the Office of Student Integrity (OSI) for adjudication. By rule, *we are required to report any student suspected of cheating or plagiarizing to the Office of Student Integrity*, who will investigate the incident and identify the appropriate penalty for violations. If you have any questions regarding your assignments and plagiarism, I encourage you to consult me before you submit the assignment. Additionally, unapproved collaboration/discussion of assignments (e.g. GroupMe activity), devices, software, and other violations of the

Honor Code may be referred to OSI. Remember that the honor code extends to a responsibility to report when you observe violations as well.Help each other out by setting clear boundaries and gentle reminders.

21.0 Statement of Intent for Inclusivity
As members of the Georgia Tech community, we are committed to creating a learning environment in which all students feel safe and included. Because we are individuals with varying needs, we are reliant on your feedback to achieve this goal. To that end, we invite you to enter into dialogue with us about the things we can stop, start, and continue doing to make our classroom an environment in which every student feels valued and can engage actively in our learning community.

22.0 Class Content Intellectual Property Policy:
There are tons of very smart people in this course that will be looking to grow intellectually. This means we will all be sharing ideas, some fully-formed, some in process, as we grow. Any work and/or communication that you are privy to as a member of this course should be treated as the intellectual property of the speaker/creator, and is not to be shared without their permission. Specifically, students may not make or distribute screen captures, audio/video recordings of, or livestream, any class-related activity, including lectures and presentations, without official GT accommodations. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Failure to follow this policy on recording or distributing class-related activities may subject you to discipline under the Student Code of Conduct.

All course materials, including In-Class Materials, Exams, 'How To' Guides and Tutorials, Sample Assignments, Student Support materials, and the like are protected by copyright law. Students may take notes and make copies of course materials for their own personal use only. However, students may NOT reproduce, distribute or display (post/upload/ screenshot/take photos of) lectures or course materials in any other way without Dr. Weigel's prior express written consent (this includes uploading course materials to "study websites" such as Chegg, Course Hero, etc...). Violations of this policy will be subject to student conduct proceedings under GT's Student Code of Conduct, and applicable laws.

23.0 Accommodations: If needed, we will make accommodations for students with disabilities, including physical, sensory, psychiatric, intellectual, or other disabilities. Intent to use accommodations should be discussed within the first week, and accommodations should be arranged in advance of their use and in accordance with the Office of Disability Services (often referred to as ADAPTS) at (404) 894-2563 and http://www.disabilityservices.gatech.edu). The above policies for intellectual property extend to the use of accommodation materials.

Course Schedule

Week	Date	Topic	Pre-Class Reading	IKE due by class start	Larger Assignment Due Dates
1	**May 16 M**	**Course introduction Science of Animal Behavior**	Ch. 1	--	--
	May 18 W	**Methods in Animal Behavior**	Ch. 2, Judson p. 9-39	--	Essay topic due 5/19 11:59 pm (Canvas)
	May 20 F	**Evolution and Animal Behavior**	Ch. 3 Judson p. 75-92	Ch. 3	1. LC HWKs due 5pm 2. 2 paragraph summary of paper due by class 5/23

BIOS4471 BEHAVIORAL BIOLOGY SUMMER 2022

Week	Date	Topic	Pre-Class Reading	IKE due by class start	Larger Assignment Due Dates
2	**May 23 M**	**Behavioral Genetics, Graphs as Data Communication**	Ch. 4, Judson p.170-211	Ch. 4	
	May 25 W	**Sensory Systems and Behavior, Graphs as Data Communication**	Ch. 5	Ch. 5	"Dear Dr." Letter Portion Due by class 5/27
	May 27 F	**Sensory Systems and Behavior** *Guest, Dr. Joe Mendelson, Zoo Atlanta*	--	--	1. LC HWKs due 5pm 2. **Exam 1 DUE 11:59pm Sunday 5/29**
	May 30 M	***No Class (Institute Holiday)***			*Start working on your annotated bib- due 6/5!*
3	**June 1 W**	**Communication**	Ch. 6	Ch. 6	*Keep working on your annotated bib- due 6/5!*
	June 3 F	**Learning and Cognition**	Ch. 7	Ch. 7	1. LC HWKs due 5pm 2. Annotated bibliography due by Sunday 6/5 at 5pm *(After this is in, begin outlining/working on your Dear Dr. draft)*
4	**June 6 M**	**Foraging and Antipredator Behavior**	Ch. 8, Ch. 9	Ch. 8 & Ch. 9	*Keep working on your Dear Dr. draft - due 6/13!*
	June 8 W	**Dispersal and Migration**	Ch. 10 Judson p. 122-132	Ch. 10	*Seriously, keep working on your Dear Dr. draft - due 6/13! Don't wait!*
	June 10 F	**Special Topics: Animal Behavior in Light of COVID**	--	--	1. LC HWKs due 5pm **2. Exam 2 DUE 11:59pm Sunday 6/12** 3. Draft Paper due by class 6/13
5	**June 13 M**	**Habitat Selection, Territoriality, and Aggression; Sociality**	Ch. 11, Ch. 15	Ch. 11 & Ch. 15	Peer Reviews due by class 6/15
	June 15 W	**Mating Behavior and Mating Systems**	Ch. 12, Ch. 13	Ch. 12 & Ch. 13	--
	June 17 F	**Parental Care**	Ch. 14	Ch. 14	1. LC HWKs due 5pm 2. Dear Dr. Paper DUE by 11:59 pm Friday 6/17 **3. Exam 3 DUE 11:59pm Sunday***

*Note that class officially ends Friday 6/17 and the exam will be available to complete that day, but we will give you a bit more time to do the exam (should you choose to use it) by having it due as usual Sunday 11:59pm.

Changes: Course content and assignments may vary from this syllabus to meet the needs of this particular class. Students will be notified in class by the instructor when adjustments to this syllabus are required.