Please find enclosed a teaching dossier which includes 1) a statement of teaching philosophy, 2) examples of course materials, and 3) copies of student evaluations. Clickable PDF links are provided below for convenience.

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Statement of teaching and mentoring philosophy

Preface: In considering my varied experiences with academic instruction, the most crucial factor that helped me develop a life-long love of learning is enthusiasm. This perspective is long grown; I can trace it directly to a specific course in my discipline that I experienced early in college, and it changed the trajectory of my life. When I think about why that experience was so influential for me, the thing that I remember most clearly was the professor's projection of joy that they derived from sharing what they loved with others. At the time, I was on pre-med autopilot – and I remember the novelty of feeling compelled to learn as much as I could about why *evolutionary biology* was so exciting. Most of us in academia have had positive experiences with teachers that led us to academic pursuits. But the impact this experience had on how I think about teaching cannot be overstated. Thinking back, I have always responded most strongly to teachers who projected passion for their discipline. Indeed, why should a student care about learning if their teacher doesn't care about what they are teaching?

Philosophy: I am an evolutionary biologist, and I care about teaching evolution because "nothing in biology makes sense except in the light of evolution."[1] Though I wish all my students would follow me in the battle of deciphering the rules of life, my job as a science educator is first to provide access to scientific literacy. Literacy in evolutionary biology has never been more important. Evolutionary processes shape every facet of the natural world, and the COVID-19 pandemic has shown us how evolution impacts our daily lives [Indeed, the story of how phylogenetics routinely saves us from dire epidemiological events is not told often enough]. More generally, a limited understanding of evolution can impede a person's ability to make informed decisions on important issues[2]. As discussed by Brandt *et al.*[3], scientific literacy encompasses four key learning goals: content knowledge, procedural knowledge, epistemic knowledge, and application of knowledge. These axes are critical in understanding and evaluating the evidence for evolutionary processes, as well as in applying evolutionary concepts to real-world situations.

My approach is to reframe evolutionary biology as a broad question rather than an exclusive focus on a prescribed set of facts. *What happens when you apply the scientific method to understanding biodiversity?* The theory of evolution is derived from this question, but many undergraduate science courses are not taught from this perspective of hypothetico-deductive reasoning. Many of the details or examples I discuss with my students won't be remembered—but if I can successfully communicate *how to think like an evolutionary biologist*, I will have made a difference that will apply directly to my students' lives, even if they don't appreciate it until later. This approach de-emphasizes exams in favor of group work, written assignments, and active participation in discussions of primary literature. I believe that this approach, which emphasizes student-centered learning and the use of primary literature, is the best way to cultivate scientific literacy and help students overcome misconceptions and cultural conflicts.

Teaching experience: I have been fortunate as a junior scientist to have had several early opportunities to iteratively design and lead an original undergraduate course, beginning as a first-year graduate student. At the time, Cornell University offered a "specialized" teaching track for graduate TAs interested in gaining experience in teaching courses emphasizing writing and discussion over exams. With the support of guidance and coursework from the John. S. Knight Institute for Writing in the Disciplines (see CV), I proposed a writing-focused seminar to offer parallel with an introductory course in my subject area—which I called *"An introduction to macroevolution."* My students attended the general course lectures, led by a rotation of professors, but all graded activities were completed in the context of my seminar course and were of my design. The inherent flexibility of the "Writing in the Majors" Teaching Assistantship allowed me to emphasize topics I found most interesting. For example, quoting from my 2018 syllabus: *"Through directed reading and writing, we will focus on building a conceptual understanding of the challenges involved in integrating micro- and macroevolution, what they mean for the study of evolution, and what they mean for understanding our human identity."* We tackled these issues by expanding various concepts of scholarly peer review into the classroom. Starting with essay critiques of classic literature in evolutionary biology, we worked toward a capstone research paper assignment: *"What are the most compelling arguments concerning the processes that generate, maintain, or constrain evolutionary change?"* By allowing undergraduate students to answer complex questions with

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[1] Dobzhansky, T. (March 1973), "Nothing in Biology Makes Sense Except in the Light of Evolution", American Biology Teacher
[2] Yacoubian HA. (2018), "Scientific literacy for democratic decision-making", Int. J. Sci. Educ
[3] Brandt, Miriam, et al. (2022) "Promoting scientific literacy in evolution through citizen science." *Proceedings of the Royal Society*

no one correct answer, they quickly learn that their original ideas can have real value and that everyone can participate in the scientific process of generating new knowledge.

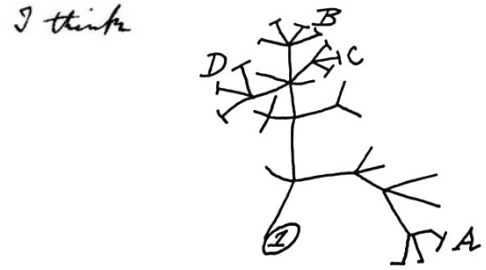
I had so much fun teaching this course that I applied (and was offered the opportunity) to teach it every semester of graduate school I was not funded through an external fellowship (see CV). In general, students responded very positively to my approach (excerpt from course evaluations):

> *Jake falls right in line with my comments about this course as a whole: amazing. Jake took a course I had very little interest in and made it one of my favorite courses. Jake provided an outlet to think far, deep, and wide about really convoluted topics in Evolutionary Biology. Consequently, I learned everything taught in the track I sections as a mere byproduct of our discussions of deeper topics. Even though this is the only evolutionary biology course I have taken; I feel capable of entering graduate studies because of how good of a course Jake put together. I have never had a graduate TA with a better teaching philosophy; Jake is truly an anomaly among his peers, and he has a very bright future as a professor.*

In my teaching approach, I prioritize creating a welcoming and inclusive learning environment where all students feel comfortable expressing their unique perspectives. I have had the opportunity to work with many students from underrepresented backgrounds; these diverse perspectives greatly enrich the classroom experience. For example, one student I recall had served in the United States Marine Corps in Afghanistan and was supported by the G.I. bill. Despite having a very different background from most of his peers, this student excelled in my course and ultimately achieved the highest grade. Another student who approached my class from the perspective of Young-Earth creationism contributed an insightful essay on evolutionary constraints. Seminar courses, which allow for a diversity of viewpoints to be safely voiced, are well-suited for fostering this type of learning environment. Nonetheless, small courses cannot accomplish the teaching mission of large universities. Although I have not yet been able to lead a lecture course, I hope to translate aspects of the small classroom techniques I have practiced to the large classroom. For example, I prefer regular quizzes in place of high-stakes exams to encourage a more consistent and less cramming-oriented approach to learning (e.g., in a typical semester survey course, students could take 12 quizzes, drop the three lowest, and take a final exam worth ~20%).

As I have always taught courses and conducted research simultaneously, my teaching experiences have greatly influenced the development of my research and vice versa. For example, teaching an introductory course requires depth and breadth in appreciating the key learning goals emphasized above. Teaching the basics of population genetics in my second and third year as a graduate student led me to re-think some of the patterns I had been struggling with in my data and come up with new ideas for ways to analyze them. Thus, my teaching experiences have led directly to novel research outcomes by encouraging me to revisit my assumptions and understanding of fundamental concepts. As a postdoctoral researcher at the University of Michigan, most of my teaching now is in the form of mentoring undergraduate and graduate student trainees. In much the same way I was inspired by the positive mentorship and encouragement I received as an undergraduate, I try to inspire and guide younger colleagues similarly. Despite the challenges posed by the COVID-19 pandemic, I have worked closely with several talented undergraduate students through the Undergraduate Research Opportunity Program. My approach is to help each student develop an original, targeted research question that can be pursued with limited resources. Through this process, I aim to help students become independent researchers and foster their scientific literacy and critical thinking skills (advisee-led articles noted in CV).

To conclude, a primary focus of my teaching philosophy is to ensure that students I interact with never feel unwelcome in participating in the academic mission of *"Lux et veritas"* (light and truth). I interpret this motto from my *alma mater* to reflect a personal commitment to cultivating transparent, inclusive, and welcoming academic communities while pursuing scientific truths. Serving as a role model for intellectual curiosity and communicating a love for learning is a key aspect of our job as teachers, perhaps even more important than communicating any set of scientific facts. Embedded within this mission, and as noted above, encouraging students to identify and ask the right questions is a critical component of teaching a hypothetico-deductive approach to *scientific thinking* more generally. This skill is invaluable in helping students navigate an increasingly complex and sometimes overwhelming flow of information. Although I expect this mission to face new challenges regularly, the effort required in guiding students to become scientifically literate and in creating inclusive teaching environments is more than justified—it is necessary.



Introduction to macroevolution
Pre-requisites: First-year introductory biology sequence

COURSE INFORMATION

Instructor: Jacob Berv (he/him/his)
e-mail: jberv@umich.edu
Office hours: By appointment (e-mail me)

Section Times and Location:
Time: MW, 3-4 pm, F, 3-5 pm
Location: TBD

Course-related inquiries: please contact me from your @umich.edu address and include 'macroevolution' followed by any relevant points in the subject line.

The intellectual framework for the course: Evolutionary biologists are often binned into two categories: those who study microevolution, and those who study macroevolution. The micro-evolutionary scale, typically studied from the perspective of molecular population genetics, gives us the intellectual framework and tools to study populations of living organisms and how their DNA evolves. By contrast, the macroscale evolutionary biologist may try to make sense of broader evolutionary patterns, which may only be directly observable from patterns in the fossil record. Because microevolutionary processes may ultimately generate macroevolutionary patterns, a research goal in the discipline of evolutionary biology is to discern the "laws" that connect evolutionary processes across these scales. Understanding the processes that drive evolution at both the micro and macro levels is essential for making sense of the patterns we observe in the natural world and for predicting how organisms will respond to changing environments. In this course, we will take the view that microevolution begets macroevolution and that the field of phylogenetic systematics provides the tools and vocabulary necessary to integrate across all levels of biological organization. Through directed reading and writing, computer lab exercises, and lectures, we will build a conceptual understanding of the challenges involved in this integration and what they mean for studying evolution.

Course Philosophy: This course has several goals which can be classified into two parts. **First,** the ability to think about topics critically and the aptitude to communicate ideas effectively through writing and discussion are essential skills for our everyday and professional lives. This course is for motivated students who are particularly interested in using writing and group discussions to integrate information from different primary literature sources and group discussion. We will explore concepts of evolutionary biology, learn how to think critically about published literature and gain experience in communicating with each other.

A **second** motivation of the course will be to introduce the comparative method and phylogenetic systematics, which encompass several disciplines within evolutionary biology that seek to derive meaningful information from the tree of life. While our reading, writing, and discussions will introduce many key concepts in this discipline, we will hold weekly lab sections in which we will explore a variety of computational approaches to studying the intersection between micro- and macroevolution.

LEARNING OBJECTIVES
By the end of the course, a successful student will:

1. Develop an understanding of the links between population genetics and phylogenetic systematics.

2. Apply phylogenetic tree-thinking concepts to interpret patterns in biodiversity data (e.g., How are phylogenies built and how are they used?).

3. Apply the scientific method from the perspective of evolutionary biology (e.g., Explain the differences between hypothesis and theory in evolutionary biology, compare the scientific method in evolutionary biology to other sciences, and analyze data to address a hypothesis).

4. Think critically about and efficiently summarize information from the primary literature (e.g., lead a discussion of the primary literature, critique one or more contrasting perspectives, or defend and debate an important topic).

5. Synthesize and communicate complex scientific concepts effectively in written and oral form.

CLASS STRUCTURE AND TEACHING METHODS

Recent pedagogical research indicates that using various instructional techniques helps to promote long-term retention and recall of new knowledge (Felder and Brent 2016). This course utilizes a variety of teaching approaches, including some lectures, handouts/worksheets, hands-on lab exercises, synthetic written work, and active discussion and presentation of primary literature. While there are many introductory textbooks on evolutionary theory, few have kept pace with developments in macroevolution and systematics, so we will largely use the primary literature in addition to textbook reading assignments. In a typical class session, we may have the opportunity to discuss course material, work on problems individually or as teams, debate concepts, and reflect on the content of the course. Students may be asked to define concepts in their own words, make predictions based on patterns in data, formulate questions, brainstorm, and troubleshoot. The instructor will sometimes present slides, but mainly as a basis for active discussion. In an average week, we will use two meetings for discussion material or in-class activity. Each week, we will also meet once to work on lab exercises.

"Minute Paper" Technique: To help me track subject areas that need more attention or clarification, we will use a variation on the "minute paper" technique. This approach involves giving students a few minutes at the end of each class period to write down the most important concepts discussed, questions that have piqued their interest, or particularly confusing concepts. These informal comments will be collected digitally (using a tool called pollEV) and reviewed by the instructor and teaching assistants. We will use this feedback to identify areas that need more attention and adjust the course content or teaching methods accordingly. After most class sessions, you will be asked to complete the minute paper, so be prepared to reflect on your learning and provide constructive feedback."

ASSESSMENTS AND GRADING

1. 30% **Weekly quizzes** (15 weeks), lowest three are dropped (1x per week)
2. 25% **Lab section activities** (1x per week)
3. 30% **Written essay assignments**
    a. 3 total (worth 10% each) (due at 5 weeks, 10 weeks, 15 weeks)
    b. There will be three written assignments of differing lengths and types, including at least one paper requiring students to research a topic in depth. Each focus will differ in content and writing st practice different scientific writing skills. In addition to these writing projects, there will be several short assignments associated with lab exercises intended to help students think critically about course material.

4. 15% **Final exam** – comprehensive final exam – multiple choice and short answer

COURSE POLICIES:

Required texts:

Evolution: Making Sense of Life, by Douglas J. Emlen and Carl Zimmer (third edition)

Modern Phylogenetic Comparative Methods and Their Application in Evolutionary Biology (2014), edited by László Zsolt Gamamszegi (provided as PDF)

Written assignment guidelines. All written assignments will be due when specified and must be turned in via email or google drive unless otherwise specified. All writing assignments, regardless of length, must be typed. Please follow these formatting guidelines:

- 12-point font (Times New Roman), 1.25' margins on the left and right, 1.0' on the top and bottom, single spaced.
- Citations & references (unless specified otherwise) should follow the formatting style of an academic journal, such as *Evolution* or *Systematic Biology*. **I strongly recommend using citation management software, such as EndNote, Papers, Mendeley or PaperPile.** Please get in touch if you are unfamiliar with this type of software.

Lecture and textbook assignments. **Students must attend class and complete the assigned readings to succeed in this course**. We will take weekly quizzes comprising two or three short answer questions to encourage attendance, completion of assignments, and regular study habits. Only 12 out of 15 of these quizzes will count toward your final grade and will be weighted as described above. Our discussions will focus on concepts introduced in the reading, and it is, therefore, essential that students familiarize themselves with readings before we discuss them as a group.

Readings. We will often use readings from the primary literature, which are generally available as downloadable PDFs. To the extent that it is possible, I prefer that students not reference PDFs from their laptop computers or devices during course meetings. When feasible, please bring printed copies of these documents to class unless it is particularly burdensome for you to do so (I recognize not all students have access to printers, so this is not a requirement and will not affect your grade). Either way, it is your responsibility to read assignments before class and to bring the work assigned for that day to class unless specified otherwise.

Accommodations for Students with Disabilities. If you need accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and how the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Services for Students with Disabilities (SSD) office to help us determine appropriate academic accommodations. SSD (734-763-3000; http://ssd.umich.edu) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.

COURSE EXPECTATIONS *What is expected from you*

Attendance and Participation. Active discussion is an integral part of this course. Therefore, attendance and participation are required and will reflect a portion of your semester grade. You must have a valid excuse [e.g., sick, family emergency] to ensure you receive credit for participating in the course for a given meeting. If you anticipate missing a meeting for a particular reason, please let me know in advance, and we will try to work out an alternative arrangement. A key goal of my teaching is to create a course environment where we all feel comfortable discussing our perspectives.

Student-led discussions and presentations. One of the goals of the course is to offer students the opportunity to practice and develop skills in leading discussions of primary literature. Students are welcome to meet with me to discuss how to approach complex material and develop discussion points or strategies. Working in pairs, students will lead a discussion of a scientific research article at least once during the semester. You will be expected to participate actively and contribute your ideas and perspectives.

Late or dropped writing assignments. You may turn in the final draft of one written work up to one week late, no questions asked. I will assess individual needs beyond this policy on a case-by-case basis. Otherwise, all late assignments will be docked one letter grade every 24 hours they are late. An assignment that is not turned in or completed beyond your one extension will receive no credit.

Originality of all Work. Students are encouraged to work together inside and outside of class when appropriate. When working together, all students must submit independent work unless noted otherwise. Plagiarism is using another's ideas, words, or products in such a way that gives the appearance that they are your own. To avoid plagiarism, paraphrase or directly quote the words of others [depending upon the situation] and provide an appropriate citation. Failure to provide proper citation can be considered plagiarism, even when unintentional. Students identified to have intentionally plagiarized may face mandated University procedures according to the honor code. If you have any questions regarding plagiarism in general or specific cases, please follow up with me before submitting an assignment.

COURSE EXPECTATIONS *What students may expect from me*

My general philosophy in teaching this course is that students who make honest and sustained efforts throughout the semester will be able to achieve high grades and that students will get out of this course what they put into it. I will continually strive to provide all students with fair opportunities to succeed in this course. To that end, you can expect feedback on assignments to be returned within one week of an assignment's due date. I will also do my best to respond to student emails or inquiries within 24 hours. While your job is to prepare for class, an important aspect of my job is to anticipate student needs, and as such, you can expect me to come to class ready to address your questions. My office hours are by appointment to provide maximum flexibility with student commitments outside class.

COURSE FEEDBACK:
I am always eager to receive feedback on the course as we progress through the semester, and we can often make real-time adjustments according to student interests/concerns. Please do not hesitate to privately offer constructive criticism of the course format or content.

DIVERSITY AND INCLUSIVITY STATEMENT
As an instructor, I am committed to creating a welcoming and inclusive learning environment for all students in my courses. This includes fostering respectful and open dialogue among students

with diverse backgrounds, beliefs, and experiences. The study of evolution can be unsettling for some students due to personal, cultural, or religious beliefs. Therefore, I encourage all students to approach the subject matter with an open mind and respect the diverse perspectives of their classmates. I am dedicated to supporting all students' learning needs and addressing any issues that may arise. By fostering a diverse and inclusive learning community, we can enrich and enhance our understanding of evolutionary biology and engage in rigorous intellectual inquiry and debate. Let's work together to create a dynamic and inclusive classroom that benefits all students.

COURSE SCHEDULE AND ASSIGNMENTS:

Week 1: Introduction

Meeting 1:
Reading:
course overview + writing handouts

Meeting 2:
Reading:
Headland and Greene 2011 (PDF)
How to read a scientific article (PDF)

Meeting 3:
Quiz 1
Lab reading: Gamamszegi Chapter 1
Lab: Introduction to lab exercises, software installation

Week 2: tree thinking

Meeting 4:
Reading:
Tree thinking readings **(PDF)**
Understanding Evolutionary History: An Introduction to Tree Thinking, Laura R. Novick et al
Reading a Phylogenetic Tree: The Meaning of Monophyletic Groups, David Baum

In class activity: Tree thinking quiz 1 (group activity)
Group homework: Tree thinking quiz 2

Meeting 5:
In class activity:
Tree thinking quiz 2 **review**

Meeting 6:
Quiz 2
Lab reading: Gamamszegi Chapter 2
Lab: Tree thinking lab (introduction to R)

Week 3: peer review

Meeting 7**:**

Reading: Peer review readings
How to become good at peer review: a guide for young scientists, Jennifer Raff
How to peer review, Matt Might
Helpful hints for effective peer review, Seri Rudolph
Striving for Excellence in peer review, Nature Editorial
In class activity: peer review discussion

Written assignment 1 out - Critique 1

Meeting 8: The last universal common ancestor
Reading:
A minimal estimate for the gene content of the last universal common ancestor—exobiology from a terrestrial perspective, Ouzounis et al 2006
The nature of the last universal common ancestor, Penny et al 1999
On the origin of eukaryotes, Zimmer 2009

Meeting 9:
Quiz 3
Lab reading: Gamamszegi Chapter 3
Lab: TBD

Week 4: On the origin of species

Meeting 10:
Reading:
On the Origin of Species chapter 1-2

Meeting 11:
Reading:
On the Origin of species chapter 3-4

Meeting 12:
Quiz 4
Lab reading: Gamamszegi Chapter 4
Lab: TBD

Week 5: Natural selection in natural systems

Meeting 13:
Reading:
Grant and Grant 2002

Meeting 14:
Reading:
Grant and Grant 2014

Meeting 15:
Quiz 5
Lab reading: Gamamszegi Chapter 5
Lab: TBD

Written assignment 2 out: Critique 2

Week 6: The limits of natural selection

Meeting 16:
Reading: The spandrels of San Marco and the Panglossian Paradigm: A critique of the Adaptationist paradigm, **Gould and Lewontin 1979**

Meeting 17:
Faculty Guest Lecture 1

Meeting 18:
Quiz 6
Lab reading: Gamamszegi Chapter 6
Lab: TBD

Week 7: Speciation 1

Meeting 19:
Reading:
Homage to Santa Rosalia or Why Are There So Many Kinds of Animals?, G. E. Hutchinson 1959

Meeting 20:
Reading:
Cryptic species as a window on diversity and conservation, Bickford et al 2006

Meeting 21:
Quiz 7
Lab reading: Gamamszegi Chapter 7
Lab: TBD

Week 8: Speciation 2

Meeting 22:
Reading:
Hybrid Zone patterns and processes, Richard Harrison
Hybridization and Speciation, Abbot et al 2013

Meeting 23:
Reading:
Hybrid zone readings TBD
Hybrid zone Lab preparation

Meeting 24:
Quiz 8
Lab reading: TBD
Lab: Hybrid zone lab exercise

Written Assignment 3 out

Week 9: Speciation 3

Meeting 25:
Reading:
Species concepts and species delimitation, De Queiroz 2007

Meeting 26:
Reading:
The Mind of the Species Problem, Jody Hey 2001
Why Should We Care about Species? Jody Hey 2009

Meeting 27:
Quiz 9
Lab reading: Gamamszegi Chapter 8
Lab: TBD

Week 10: Speciation 4

Meeting 28:
Faculty guest lecture 2

Meeting 29:
Reading:
Choosing among Alternative "Phylogenetic" Species Concepts, Baum and Donoghue 1995

Meeting 30:
Quiz 10
Lab reading: Gamamszegi Chapter 9
Lab: TBD

Week 11: Speciation 5

Meeting 31:
Reading:
Species are not Biologically Real entities, Mishler 2010
Species Concepts and Definitions, Mayr

Meeting 32:
Debate

Meeting 33:
Quiz 11
Lab reading: Gamamszegi Chapter 10
Lab: TBD

Written Assignment 4 out

Week 12 – Diversification

Meeting 34:

Reading:
Punctuated Equilibrium: an Alternative to Phyletic Gradualism, Eldredge and Gould

Meeting 35:
TBD

Meeting 36:
Quiz 12
Lab reading: Gamamszegi Chapter 11
Lab: TBD

Week 13: Evolutionary developmental biology

Meeting 37:
Reading:
Multiple recent co-options of Optix associated with novel traits in adaptive butterfly wing radiations, Arnaud Martin et al 2014

Meeting 38:
Reading:
Wings, Horns, and Butterfly Eyespots, How Do Complex Traits Evolve? Monteiro 2009

Meeting 39:
Quiz 13
Lab reading: Gamamszegi Chapter 12
Lab: TBD

Week 14: Human evolution

Meeting 40:
Reading:
Reconstructing human evolution: Achievements, challenges, and opportunities, Bernard Wood

Meeting 41:
Reading:
Cospeciation of guy microbiota with hominids, Moeller et al 2016

Meeting 42:
Quiz 14
Lab reading: Gamamszegi Chapter 13-15
Lab: TBD

BioEE 1780 WIM Assignment 1 - Fall 2018
TA: Jacob Berv
Re: Dobzhansky 1973

An important component of *thinking* like a scientist is learning how to critique and review the ideas of other scientists. Though the word "critique" may connote a *negative* perspective in colloquial use, we will use it in the more academic sense to imply a thoughtful analysis or assessment.

For this assignment, please write a (single spaced, 2-page, 1.25 inch margins, Times New Roman or Cambria font size 12) critique of Theodosius Dobzhansky's famous article, *Nothing in Biology Makes Sense Except in the Light of Evolution.*

Below are some suggestions of things to think about while you write your response. You are not limited to these ideas or required to discuss any of them. Above anything else I want you to first think about *what you think*, and then to articulate that opinion in writing.

One way to start might be to first think broadly about the author's thesis and the evidence they provide, and then to decide whether or not you agree with the author's conclusions. Perhaps consider the author's motivation in writing this piece and the context in which it was written. If you were writing this article today, how might you have written it differently, and why?

Consider the content, as well as the structure and style of the writing itself. What did you like about this piece? What didn't you like about it? What writing techniques did the authors use, and were they effective? Were you convinced by the author's prose?

Please try to ensure that your response satisfies three basic requirements. Beyond these guidelines, the format is up to you.

1. Structure
    a. Does your response have a clear structure, including a beginning, middle, and end?

2. Clarity
    a. Is your prose clear?
    b. Are there grammatical errors?
    c. Do you use vague or non-specific terminology?
    d. Does your writing contain the passive voice?

3. Argument
    a. Are you saying *something*? Have you persuaded, or at least enlightened the reader of your opinion?

See the writing handouts for more general tips and pointers.
The first draft of this assignment will be due to your private Google drive at the end of the day (5pm) on 9/21/18. Additional instructions will follow.

BioEE 1780 WIM Critique 2 - Fall 2018 – Draft 1 due 10/12/18 by 5PM
Re: Gould and Lewontin 1979

For this assignment, I'd like you to write a (single spaced, 2 page maximum, 1.25 inch margins, Times New Roman or Cambria font size 12) review of Gould and Lewontin's famous article, *The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme*.

In general, this assignment is in the same spirit as Critique 1:

> One way to start might be to first think broadly about the author's argument and provided evidence, and then to decide whether or not you agree with the author's conclusions. Perhaps consider the author's motivation in writing this piece and the context in which it was written. If you were writing this article today, what might you have done differently, and why?
>
> Consider the content, as well as the structure and style of the writing itself. What did you like about this piece? What didn't you like about it? What writing techniques did the authors use, and were they effective?

However, I'd like you to change your mindset a little – this time, imagine you've received this paper to review for a prestigious scientific journal. It's now your responsibility to effectively summarize the main points for the editor, and to evaluate whether or not it represents a valuable contribution to the field. As we discussed, peer-reviews are an extremely valuable resource for scientific authors, so try to keep your criticism constructive. Use your review to make the case for or against publication, but be specific with your recommendations. Feel free to bring in outside sources you're familiar with, or to reference material we've discussed in the section or lecture to help build your argument.

For your first assignment, the audience you were writing for was fairly open ended. This time, imagine your audience is an educated, but perhaps unfamiliar editor who wants to accept only the highest quality articles. You should not assume the editor has substantial background knowledge on the topic.

Typically, peer-reviews for journal articles end with a statement of whether or not a paper should be accepted with minor or major revisions, rejected with permission to resubmit after changes have been made, or rejected outright. Journals often have mysterious internal criteria for determining whether or not a work is 'worthy' of publication. In your own determination of this paper's merit, I'd like you to use your own clearly defined criteria to arrive at a verdict.

If you do reference outside material, please cite it appropriately using the typical journal format (ex (Berv 2014), with associated reference at the end), to ensure you are adhering to Cornell's academic integrity policy, which can be found here: http://cuinfo.cornell.edu/aic.cfm. I strongly encourage the use of citation management software like EndNote, Papers, or Mendely.

Please see the writing handouts posted to the google drive for more general tips and pointers.

The first draft of this assignment will be due on 10/12 at 5pm.

Jacob Berv
BIOEE 1780 WIM, Fall 2018

Collections Lab: Hybrid Zone Research Paper
Data collection: Tuesday October 30
Report Due: Friday the 9th, midnight
Jake's availability for consultation: by appointment

Overview: Hybrid zones, or regions where genotypically and phenotypically distinct populations come into contact and interbreed, have played an important role in advancing our understanding of processes involved in speciation.

For this assignment you will study a hybrid zone that occurs between subspecies of Northern Flickers (*Colaptes auratus*) to determine whether or not it is a primary or secondary hybrid zone. You will then write a formal report describing your findings.

You will collect data from museum specimens on specific phenotypic traits, and study how trait variation changes across the hybrid zone. Data collection will take place at the Cornell University Museum of Vertebrates at the Lab of Ornithology.

Activity 7 from the 2013 section manual – This document provides much useful information on hybrid zones in general and your study organism in particular. You need to read it thoroughly to understand the purpose behind the exercise and how you will collect and interpret your data. You will also probably find it very useful to refer back to as you work on your paper.

Question set – These are questions that will help you test your understanding of the material. They will not be collected or graded but answering them will help guide you in writing your report.

Data sheet – This pre-configured Excel spreadsheet will be useful for graphing data.

WRITING YOUR REPORT: Once you have collected your data you will write up your results in the format of a scientific research paper. Research papers typically have five sections including (1) Abstract [1p (paragraph)] (2) Introduction [~3p], (3) Methods [~1p], (4) Results [~2p], and (5) Discussion [~3p]. Brackets indicate the minimum number of paragraphs I ask you to write for each section.

Abstract – The abstract is typically a one-paragraph overview of your entire research paper, including a brief introduction to the question of interest, your methods and results, and the most prominent conclusions you have drawn. You will may find it helpful to write your abstract after you have written the main body of your report.

Introduction – The Introduction presents relevant background information on the question and study system. For this paper you may want to address questions such as:

1. What are hybrid zones and why are they of interest?
2. What kinds of hybrid zones are there?
3. What is the question or hypothesis that motivated your research?
4. What predictions are made by your hypothesis, and what kind of data would allow you to test them? What kind of observations would falsify your hypothesis?
5. What is your study organism, and what characteristics make it good for addressing the question that is of interest?

Jacob Berv
BIOEE 1780 WIM, Fall 2018

Methods – This section should clearly outline how you collected and analyzed your data such that a researcher could later recreate your results by following the methods you used. Some questions to consider:

1. What organisms and populations were studied (you will use museum specimens, so ideally you should be able to say exactly which specimens were studied so that a future scientist could go to the museum and look at the same specimens)?
2. What traits were measured and how?
3. What analytical methods were applied to the data?

Results – The results section should be a straightforward description of the patterns that your data revealed; do not simply list all of your raw data. *Avoid interpretation* of your results in this section. Save such discussion of specific patterns for the **Discussion** section. Sometimes the best way to present findings is with figures or tables, which would be appropriate to cite in the **Results**.

Some results you should mention:
1. How do the different traits that were measured vary among populations?
2. What is the relationship between patterns of trait variation and geographic space? Does this relationship vary for different traits?

Discussion – The Discussion section is where you should draw conclusions regarding the questions that you initially proposed and discuss their implications. You can highlight potential problems with the study, future directions for research, and other relevant research that showed similar or contrasting patterns.

Here are some more questions to think about:
1. Are the results consistent with the hypothesis/question? Or should you reject your hypothesis?
2. What does this conclusion suggest about the biology or history of the organism in question?
3. Can you propose a plausible explanation for the pattern?
4. Are there other studies which show similar patterns? Why might they be expected to?
6. What other studies show contrasting patterns? Again, why?
7. What might have improved the current study (e.g., in the methods)?
8. What future research is suggested by the results of this study?
9. This study was based on specimens from a research collection – what are some advantages/disadvantages to using research collections for this study?

Formatting notes: Please single-space your paper and use a 12 pt. Times New Roman font or 11 pt. Arial font. Use section subheadings where appropriate. In your figures or tables, cite them in the text as in the following examples.

Ex/ The distribution of Northern Flickers spans North America (Figure 1), demonstrates that...
Ex/ I studied variation in wing spots from 18 populations of *Limenitis arthemis* (Table 1).

For this assignment, I ask that you use the citation format for the journal *Evolution*. I will take points off for failing to appropriately cite sources.

Check the following website for additional details and specific examples:
http://www.eeb.uconn.edu/eebedia/index.php/General_rules_for_citing_sources_in_scientific_writing

Jacob Berv
BIOEE 1780 WIM, Fall 2018

Figures, tables, and legends: You should include a figure or table to improve the clarity of your presentation. **These should be added on separate sheets of paper at the end of your paper (following the references section). Figures and tables need to include separate captions and descriptions.** The convention is for figure captions to be placed **below the figure**, and table captions to be placed **above the table**. Captions should clearly state what information is found in the figure/table and should make it easy for a reader to interpret.

For example, if different colored lines represent different traits, be sure to indicate which color represents which trait. Also, be certain to have appropriate labels on axes of graphs or rows/columns of tables.

INFORMATION SOURCES: You can use the section handout for background information on hybrid zones, but I highly encourage you to seek outside sources, such as Rick Harrison's 1993 book chapter, "Hybrids and hybrid zones: historical perspective." As always, you are welcome to explore the primary literature on your own.

Collections LAB - Pre-Exercise Questions (be able to answer these for Tuesday)

1) What is a primary hybrid zone? A secondary hybrid zone? What are the fundamental ways in which they differ?
2) In this exercise, you will measure and compare multiple phenotypes among six populations of either Admiral butterflies or Northern flickers across a geographic transect in order to determine whether a hybrid zone is primary or secondary.
3) Why is it useful to look at the frequency changes of *multiple* (more than two) phenotypic traits in order to classify the hybrid zone?
4) What are some of the advantages and limitations of doing research on specimens collected across time and geographic ranges and maintained in a collection?

Collections LAB - Post-Exercise Questions (be able to answer these questions in preparation for your report)

1) Briefly describe the traits you measured, including discussion of any problems that you encountered in making the measurements.
2) Describe the patterns you see in your graphs. Do the data suggest this is a primary or a secondary hybrid zone? Explain your reasoning.
3) What additional data, information, or observations would help make your conclusion from question 2 more certain? Describe one thing you'd like to measure or find out and explain why it would help
4) Describe a plausible scenario that could have produced the pattern you observed in your data.
5) Studies that use pre-existing collections of organisms are called collections-based studies. There are advantages and disadvantages to studying organisms in a collection, as opposed to studying organisms that you observe or collect specifically for the purposes of your research. Describe two advantages and two disadvantages of collections-based studies.

Jacob Berv
BIOEE 1780 WIM, Fall 2018

General Background Information on Cornell's collections

Cornell Lab of Ornithology: Museum of the Vertebrates

A brief introduction to the museum ("home" at http://www.cumv.cornell.edu/)

The Cornell University Museum of Vertebrates (CUMV) is an internationally recognized institution dedicated to the study of vertebrates (fishes, amphibians, reptiles, birds and mammals). It is one of several natural history collections affiliated with Cornell University. The CUMV collections contain over **1.5 million specimens** and serve as the primary repositories for vertebrates collected by past and present Cornellians doing research around the world. As a university-based museum, it also serves as an important resource for undergraduate and graduate education.

The CUMV is administered through the Department of Ecology and Evolutionary Biology and the College of Agriculture and Life Sciences at Cornell University. The museum is located approximately five miles north of the Cornell campus, at the Johnson Center for Birds and Biodiversity, along with the Cornell Lab of Ornithology. The museum moved to this facility in 2003.

As a research institution, CUMV specimens, tissue samples and related specimen data are available to qualified members of the scientific community affiliated with academic and research institutions. Cornell students are especially encouraged to use the collections for research, whether as thesis work, independent study, or class projects. Although there are no public exhibits at the museum, museum staff try to provide assistance to members of the Cornell Community whenever possible.

CUMV Ichthyology Collection (http://www.cumv.cornell.edu/collections/fishes/)

The CUMV Ichthyology Collection was established shortly after the founding of the university in 1865. Today the collection contains over 91,000 cataloged lots and more than 1.2 million specimens. Over 320 families and 4500 species from 95 countries are represented. The bulk of the collection is strongly representative of freshwater fishes from eastern North America and has formed the basis for numerous systematic works on the North American fish fauna. While the majority of the collection consists of alcoholic specimens, it also contains a growing number of skeletal specimens and tissue samples associated with voucher specimens.

CUMV Herpetology Collection (http://www.cumv.cornell.edu/collections/herps)

The CUMV Herpetology Collection became one of the leading university based herp collections in North America during the first half of this century. The major strengths of the collection include amphibians from the southeastern United States and both reptiles and amphibians from the Northeast. At present, the cataloged collection contains 29,000 alcoholic specimens, 172 dry skeletons, and 457 cleared and stained specimens. In all approximately 300 species of amphibians and 500 species of reptiles are represented. Through collecting, exchanges and acquisition of other various collections there is now a good representation of Costa Rican viperids, lizards from Western and South Australia, amphibians and reptiles from Puerto Rico, snakes and lizards from Mexico, and a more representative collection of African and European species.

CUMV Ornithology Collection (http://www.cumv.cornell.edu/collections/birds)

The CUMV Ornithology Collection contains a record of the development of ornithology at Cornell dating back to 1915. The collection currently consists of approximately 38,300 round skins, 700 flat skins, 1000 spread wings, 5,500 skeletons, 1,400 fluid-preserved specimens, 3,200 egg sets, 590 nests, and 1,000 uncataloged mounts. Approximately 350 of the skeletons have an associated flatskin, and approximately

150 round skins have a separate spread wing. **The collection has a worldwide coverage, with approximately half the species of the world's birds represented, as well as a number of recently extinct species (such as the Ivory-billed Woodpecker, the Carolina Parakeet and the Passenger Pigeon).** All families are represented except the Atrichornithidae. Specimens are present from all continents and more than 134 different countries. The collection is particularly strong in North American material; very few species that breed or regularly occur north of Mexico are missing as skins. Strongest holdings within this area are New York, Nebraska, Texas, Arizona, California, Oklahoma, Florida, South Dakota, Colorado, Manitoba, and Alaska, but all 50 US states and 10 of the Canadian provinces and territories are represented. The area of next greatest representation is Mexico, especially the states of Veracruz, Chiapas, Tamalipas, Puebla, Nuevo Leon, and Oaxaca. The collection contains much topotypical material, but no type specimens are currently kept in the collection.

Another important bird collection at Cornell is the Macaulay Library of Natural Sounds at the Cornell Laboratory of Ornithology. MLNS is the largest collection of its kind in the world, with recordings of over 5,000 species of birds. The Lab of Ornithology is a membership institute dedicated to the study, appreciation, and conservation of birds. The Lab fosters understanding about nature and contributes to efforts to protect biological diversity through programs of research, education, and citizen science.

CUMV Mammalogy Collection (http://www.cumv.cornell.edu/collections/mammals)
The CUMV Mammalogy Collection includes approximately 11,500 skins, 11,770 skulls, 3,240 skeletons, and 530 fluid-preserved specimens. The collection is one of the largest of New York mammals, and has a strong representation of eastern North America taxa, containing all species of land mammals in the region. With only a few exceptions, all the genera of land mammals in the United States and Canada are represented.

One hundred and two of the 136 families are represented in the collection. Specimens are present from all continents except Antarctica and more than 100 countries. The collections are particularly strong in North American material. Strongest holdings in this region are from New York, New Jersey, Colorado, California, and Pennsylvania but 48 of the 50 US states and 10 of the Canadian Provinces and Territories are represented.

Entomology Collection at Comstock Hall

The entomology department was founded by John Henry Comstock- hence the name of the building. Comstock was an undergraduate in 1870s. In 1871, as a sophomore, he started teaching entomology! Comstock was also a chimesmaster, and in those days the bells weren't in the clock tower, they were in the little tower of McGraw Hall. Chimesmasters were provided with a dorm room there to be near the bells. "Hank" Comstock started the insect collection in his room in McGraw Hall.The insect collection has since grown, mostly from donations of specimens and from the work of Cornell faculty. It now contains approximately 6-7 million pinned specimens, 100,000 microscope slides, and 60,000 ethanol vials.

Insects are kept in drawers, and cabinets organized by taxonomic group… much like a library. Insects are killed (usually in a jar with some quick acting poison gas) and then pinned and tagged.

BioEE 1780 WIM 2018 – Jacob Berv
Assignment 4

Important Dates:

11/12: Assignment out

11/19 midnight: Draft 1 + peer exchange

1 paragraph peer comments due 11/21 midnight (apologies for proximity to Thanksgiving – this is somewhat unavoidable – this part of the assignment should not be terribly time consuming).

11/27 midnight: Draft 2 due

Over the last two months, we have plunged into the complex and sometimes confusing world of evolutionary biology – in particular we have focused (implicitly) on the connection between microevolutionary processes and macroevolutionary patterns. My goal has been to expose you to the established theory while simultaneously emphasizing that few of the fundamental concepts we often take for granted are without caveat. These ideas, and many others, form the basis of our modern scientific understanding of life on Earth. As some examples:

1. Optimization by natural selection is perhaps a dominating force, but it may be attenuated by evolutionary or developmental constraint—implying that constraints may be more important (or interesting) than selection.
2. The evolution of ornamentation and sexual signals may be driven by natural selection, or they may be driven by subjective female perceptions, or perhaps both.
3. Speciation happens, but we arguably do not have an objective 'definition' of species that can be equally applied to all forms of life.
4. Mutation is the underlying source of genetic diversity, but the strength of its effect will depend on population parameters.
5. Phylogenetic tree-thinking is a critical part of evolutionary biology, but a strictly bifurcating tree may not represent the best abstraction of the tree of life; a network or web may be more accurate.

For this assignment, I would like you to generate a 2.5 to 3-page (single spaced) essay that discusses the major drivers of evolutionary change. First**,** review the material we've discussed in section, and the material covered in the lecture to identify one focal interest, or several. Then, ask yourself, "*What have I found to be the most compelling arguments regarding the processes that generate, maintain, and perhaps constrain evolutionary change?*" As long as your goals and arguments are clearly defined, I am not looking for any specific trajectory: **there are many different and equally valid ways to approach this assignment.** You may draw on any of the readings we have discussed in section, the textbook, lectures, vodcasts, or any outside source you feel may be relevant (always with appropriate citation). I encourage you to meet with me to discuss ideas or drafts, or to send me any questions via email. We have not covered all there is to cover in this course, and it is likely that your perspective will change over the next couple of weeks – this is fine – and you are welcome to adjust the content of your essay as you develop your ideas.

Some specific suggestions: You may want to start with a brief discussion of evolutionary change itself, and what you understand that to mean. This could be followed with specific examples from the literature to justify your definitions, and then additional discussion of what you have identified as the primary factors implicated in evolutionary change. A more ambitious, but possible alternative approach might be to try to articulate *all* of the known drivers of evolutionary change, perhaps ranked by some criteria that you define.

Your essay must be appropriately referenced and must include a bibliography. I highly recommend citation management software such as EndNote, Mendeley, or Papers. Please use please use 1-inch margins, and Arial font of no less than 11pt.

BIOEE 1780 – Fall 2018
TA: Jacob Berv

Writing in the Majors Optional (extra credit) Fifth Assignment
Depending on your response, I will add up to **5 points (scaled relative to the points below)** to your final grade – but will not take any points away.
Due December 10th by 5:00PM

Part I: As an eminent evolutionary biologist, you have spent your entire career focused on a particular group of organisms, the lolcats. You've contributed many scientific papers to the field and are regarded as *the* expert on the lolcats. As a life-long explorer, you have tracked the lolcats from the highest peaks in the Himalayas (home to the predatorial four-winged doomcats), to the deepest trenches of the Pacific Rim (home of 12 tentacled jellycats)—always in search of a new discovery.

As luck would have it, a new species of lolcat unknown to science was recently discovered on an expedition to the remote jungles of Elmira, NY. As an expert in lolcat biology, you were approached by the National Geographic Society to conduct the first field observations of this enigmatic creature, and to analyze its phylogenetic history. After many months of rigorous study, publication in peer-reviewed journals, and media coverage, you've decided to write a new entry about this taxon in your forthcoming memoir/field guide: *On the origin of lolcats.*

(2-3 paragraphs, 35 points): Write a field guide entry describing the life-history, morphology, and evolutionary context of this new species. Discuss and describe at least three life-history characteristics that characterize this new lolcat. Where does this species fall in the tree of life, and what is it most closely related to? What are the synapomorphies of the group(s) in which it is a member?

Part II (1-2 paragraphs, 20 points): This particular lolcat seems to exhibit striking sexual dimorphism. What processes and behaviors might be driving these phenotypic differences?

Part III (1-2 paragraphs, 20 points): Further observations indicate the new lolcat exists in parapatry with a suspiciously similar lolcat species along an isolated elevational gradient, but no hybrids are observed. What are some potential interpretations of the observation that these species are very similar yet do not mix genetically via interbreeding?

Part IV (1-2 paragraphs, 25 points): In this population of lolcats, you hypothesize that ability to see in low-light conditions is extremely important for prey capture success. The ratio of the optical aperture to the focal length of the eye's lens gives you an f-number (no units), and a lolcat with a low f-number (~1.0) will have vision that is better adapted to low light. You can assume that f-number has a simple genetic basis. Describe how you would test the following in your population of lolcats: (1) How heritable is the f-number and (2) how much variance in the trait can be attributed to the environment? What methods would you use? Which equations from lecture would be most useful, and how would you apply them?

Your response to Parts I-IV, including any relevant citations, illustrations, or photographs, has a maximum limit of two single spaced pages, Arial font with 1-inch margins. Feel free to be creative with your details, but everything you write must be consistent with the principles of evolutionary theory we have covered this semester.

College of Agriculture and Life Sciences
Office of Academic Programs
Student Appraisal of Teaching Assistant

FALL 2013

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

Gender

5	Male
7	Female
0	Declined

Student Year

1	Freshmen	2	Seniors
2	Sophomores	0	Grad Students
7	Juniors	0	Other/Declined

School or College

7	Ag & Life Science	0	Human Ecology
0	Architecture	0	ILR
5	Arts & Sciences	0	Unclassified/ExMu
0	Engineering	0	Graduate School
0	Hotel	0	Declined

Course Intended/Required for Major

11	Yes	0	Undecided
1	No	0	Declined

Approximate Grade in Course

10	A	0	D	0	U
2	B	0	F	0	Declined
0	C	0	S		

Approximate Cum Average

3	4.0	0	2.5	0	1.0
6	3.5	1	2.0	0	n/a
2	3.0	0	1.5	0	declined

Average is:

9	Cornell Ave.
3	Transfer Ave.
0	Declined

Reason for Taking Course

11	Required for Major	0	Required for Grad Work
2	Has Great Reputation	0	Other
10	Subject Matter of Interest		

1=very low or never; 2=low or rarely; 3=medium or sometimes; 4=high or frequently; 5=very high or always

		Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	No Resp.	Mean	Std. Dev.
8.	Seems knowledgeable in the subject matter	0	0	1	6	5	0	4.3300	0.6500
9.	Is well prepared for class	0	0	3	7	2	0	3.9200	0.6700
10.	Uses class time efficiently	1	1	3	5	2	0	3.5000	1.1700
11.	Stimulates deeper thinking about the subject	0	0	2	2	8	0	4.5000	0.8000
12.	Makes me feel free to ask questions	0	0	1	3	8	0	4.5800	0.6700
13.	Provides clear and comprehensive explanations	1	1	4	5	1	0	3.3300	1.0700
14.	Communicates interest in helping students learn	0	0	2	4	6	0	4.3300	0.7800
15.	Is willing to help students outside of class	0	1	1	2	8	0	4.4200	1.0000
16.	Coveys enthusiasm in teaching the material	0	0	1	0	11	0	4.8300	0.5800
17.	Is organized in presenting the material	1	1	1	7	2	0	3.6700	1.1500
18.	Involves everyone in class	0	2	3	4	3	0	3.6700	1.0700

College of Agriculture and Life Sciences
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Student Appraisal of Teaching Assistant

FALL 2013

Course
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Instructor
Jacob Berv

1=very low or never; 2=low or rarely; 3=medium or sometimes; 4=high or frequently; 5=very high or always

		Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	No Resp.	Mean	Std. Dev.
19.	Grades Equitably	0	0	1	3	8	0	4.5800	0.6700
20.	Comments on my work in ways that help me learn	1	0	1	4	6	0	4.1700	1.1900
21.	Realizes when students do NOT understand	1	1	2	6	2	0	3.5800	1.1600
22.	Overall the quality of my TA's teaching is:	0	1	2	5	4	0	4.0000	0.9500

Self-reported Info about Student:

23.	Your interest in taking the course before you enrolled	1	0	4	5	1	1	3.4500	1.0400
24.	Your effort to learn in this course (studying, doing assignements, thinking about ideas)	0	0	5	2	5	0	4.0000	0.9500
25.	The amount that you have learned in the course thus far	0	1	4	4	3	0	3.7500	0.9700

	Average	Standard Dev

College of Agriculture and Life Sciences
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Student Appraisal of Teaching Assistant

FALL 2013

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

Student Comments

Definitely enjoyed it. Would recommend the course to others. It's not perfect. Emails could be somewhat unorganized. Some sections felt like time could be utilized better. Could use more focus on topics rather than discussions heading off on tangents. But I learned a lot and enjoyed learning it and that's what I wanted.

Jake is a wonderful TA that takes his time to emphasize on the learning aspect of the course. The WIM section naturally provides flexibility in allowing the TA the freedom to design the course around whatever aspects h/she chooses. I feel that Jake has taken advantage of this to the fullest by providing students with multiple opportunities normally unavailable to others, such as the trip to the Lab of Ornithology, fossil collecting, and guest speakers. He is clearly very dedicated to his line of work in evolutionary biology, and this enthusiasm shows in the way he teaches. I would recommend this class and Jake to anyone. Likely one of the most engaging and intellectually stimulating classes offered at Cornell.

THis was his first TA job, and I think that was evident. His explanations of the material were very difficult to follow.

When taking other tough classes, it is hard to stay on top of this one in a way that I will learn a lot rather than just get the grade. It's not the class, it's the other classes. That can't really be helped.

Jacob was an excellent TA, and one of the only reasons this class was meaningful to me.

College of Agriculture and Life Sciences
Office of Academic Programs
Student Appraisal of Teaching Assistant

FALL 2014

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

Gender

4	Male
4	Female
0	Declined

Student Year

4	Freshmen	1	Seniors
1	Sophomores	0	Grad Students
2	Juniors	0	Other/Declined

School or College

5	Ag & Life Science	0	Human Ecology
0	Architecture	0	ILR
3	Arts & Sciences	0	Unclassified/ExMu
0	Engineering	0	Graduate School
0	Hotel	0	Declined

Course Intended/Required for Major

7	Yes	0	Undecided
1	No	0	Declined

Approximate Grade in Course

5	A	0	D	0	U
3	B	0	F	0	Declined
0	C	0	S		

Approximate Cum Average

2	4.0	0	2.5	0	1.0
3	3.5	0	2.0	1	n/a
2	3.0	0	1.5	0	declined

Average is:

7	Cornell Ave.
1	Transfer Ave.
0	Declined

Reason for Taking Course

8	Required for Major	0	Required for Grad Work
2	Has Great Reputation	0	Other
4	Subject Matter of Interest		

1=very low or never; 2=low or rarely; 3=medium or sometimes; 4=high or frequently; 5=very high or always

		Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	No Resp.	Mean	Std. Dev.
8.	Seems knowledgeable in the subject matter	0	0	0	1	7	0	4.8800	0.3500
9.	Is well prepared for class	0	0	1	1	6	0	4.6300	0.7400
10.	Uses class time efficiently	0	0	2	2	4	0	4.2500	0.8900
11.	Stimulates deeper thinking about the subject	0	0	0	1	7	0	4.8800	0.3500
12.	Makes me feel free to ask questions	0	0	0	1	7	0	4.8800	0.3500
13.	Provides clear and comprehensive explanations	0	0	0	2	6	0	4.7500	0.4600
14.	Communicates interest in helping students learn	0	0	0	0	8	0	5.0000	0.0000
15.	Is willing to help students outside of class	0	0	0	0	8	0	5.0000	0.0000
16.	Coveys enthusiasm in teaching the material	0	0	0	0	8	0	5.0000	0.0000
17.	Is organized in presenting the material	0	0	2	2	4	0	4.2500	0.8900
18.	Involves everyone in class	0	1	0	1	6	0	4.5000	1.0700

College of Agriculture and Life Sciences
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Student Appraisal of Teaching Assistant

FALL 2014

Course
BIOEE 1780 DIS 219

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Jacob Berv

1=very low or never; 2=low or rarely; 3=medium or sometimes; 4=high or frequently; 5=very high or always

		Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	No Resp.	Mean	Std. Dev.
19.	Grades Equitably	0	0	1	1	6	0	4.6300	0.7400
20.	Comments on my work in ways that help me learn	0	0	0	1	7	0	4.8800	0.3500
21.	Realizes when students do NOT understand	0	0	2	2	4	0	4.2500	0.8900
22.	Overall the quality of my TA's teaching is:	0	0	1	0	7	0	4.7500	0.7100

Self-reported Info about Student:

23.	Your interest in taking the course before you enrolled	2	2	0	1	3	0	3.1300	1.8100
24.	Your effort to learn in this course (studying, doing assignements, thinking about ideas)	0	0	2	4	2	0	4.0000	0.7600
25.	The amount that you have learned in the course thus far	0	1	1	1	5	0	4.2500	1.1600

Average	Standard Dev

College of Agriculture and Life Sciences
Office of Academic Programs
Student Appraisal of Teaching Assistant

FALL 2014

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

Student Comments

I took this course for writing in the majors (WIM) and absolutely loved it! I was interested somewhat in the material before hand but really enjoyed the way it was presented in this course. Even when we were learning about something that didn't particularly interest me the WIM aspects really made me enjoy the course overall. I would highly recommend this course to others. Also Jacob Berv did a wonderful job teaching the course. I thoroughly enjoyed all of the "outside" work that he introduced to the course (lab of ornithology trip, museum of the earth, guest speakers including birds, sharks, etc). He was also incredibly helpful in improving my writing skills and was always readily available to look at and give feedback about essays as often as I needed.

I am so happy I took the WIM section. I would not have wanted to do it any other way. I learned a lot and had a great time getting to know everyone. My TA was super helpful with advice about graduate school and life.

Jake always did a great job of assigning articles that were relevant to the coursework but also miles ahead in terms of challenging our understanding of and appreciation for the material. I'm very glad I chose to take the WIM version of this course!

By far my favorite class this year. Jake made evolutionary far more interesting than the lecture. He applied the concepts from lecture into a much larger and worthwhile picture. He always made sure we knew how the content applied to the current breakthroughs in evolutionary biology. He brought in excellent speakers and made the class as hands on as possible. I looked forward to every class and was never disappointed. What's more, I learned a ton about writing with Jake. His assignments were very interesting and always challenged me as a writer and reader. However, he was always available to help, and I made many meetings with him for extra help, and they did Help. Overall, no complaints give Jake a medal, he is awesome.

My only major complaint is that I was not allowed to conduct a rewrite of the only paper that I was given a poor grade on (under still-dubious criteria) when other students told me that they had been allowed - it seemed unfair to evaluate my performance in the course without giving me this same "handicap" as others, and I still suspect that this was primarily done to shadily lower the section average. With that said, this was an isolated incident, and while I very clearly did not appreciate the surprise impacting my grade so significantly, I believe that it should not significantly hurt my final grade (possibly moving it down from an A+ to an A, which is still annoyingly significant as a 5-credit course).

College of Agriculture and Life Sciences
Office of Academic Programs
Student Appraisal of Teaching Assistant

FALL 2015

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

Gender

3	Male
4	Female
0	Declined

Student Year

1	Freshmen	2	Seniors
4	Sophomores	0	Grad Students
0	Juniors	0	Other/Declined

School or College

4	Ag & Life Science	0	Human Ecology
1	Architecture	0	ILR
2	Arts & Sciences	0	Unclassified/ExMu
0	Engineering	0	Graduate School
0	Hotel	0	Declined

Course Intended/Required for Major

6	Yes	0	Undecided
1	No	0	Declined

Approximate Grade in Course

7	A	0	D	0	U
0	B	0	F	0	Declined
0	C	0	S		

Approximate Cum Average

4	4.0	0	2.5	0	1.0
2	3.5	0	2.0	0	n/a
1	3.0	0	1.5	0	declined

Average is:

6	Cornell Ave.
1	Transfer Ave.
0	Declined

Reason for Taking Course

6	Required for Major	0	Required for Grad Work
2	Has Great Reputation	1	Other
2	Subject Matter of Interest		

1=very low or never; 2=low or rarely; 3=medium or sometimes; 4=high or frequently; 5=very high or always

		Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	No Resp.	Mean	Std. Dev.
8.	Seems knowledgeable in the subject matter	0	0	0	0	7	0	5.0000	0.0000
9.	Is well prepared for class	0	0	0	0	7	0	5.0000	0.0000
10.	Uses class time efficiently	1	0	0	4	2	0	3.8600	1.3500
11.	Stimulates deeper thinking about the subject	0	0	0	0	7	0	5.0000	0.0000
12.	Makes me feel free to ask questions	0	0	0	0	7	0	5.0000	0.0000
13.	Provides clear and comprehensive explanations	0	0	0	2	5	0	4.7100	0.4900
14.	Communicates interest in helping students learn	0	0	0	0	7	0	5.0000	0.0000
15.	Is willing to help students outside of class	0	0	0	0	7	0	5.0000	0.0000
16.	Coveys enthusiasm in teaching the material	0	0	0	0	7	0	5.0000	0.0000
17.	Is organized in presenting the material	0	0	1	1	5	0	4.5700	0.7900
18.	Involves everyone in class	0	0	0	0	7	0	5.0000	0.0000

College of Agriculture and Life Sciences
Office of Academic Programs
Student Appraisal of Teaching Assistant

FALL 2015

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

1=very low or never; 2=low or rarely; 3=medium or sometimes; 4=high or frequently; 5=very high or always

		Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	No Resp.	Mean	Std. Dev.
19.	Grades Equitably	0	0	0	0	7	0	5.0000	0.0000
20.	Comments on my work in ways that help me learn	0	0	0	1	6	0	4.8600	0.3800
21.	Realizes when students do NOT understand	0	0	0	0	7	0	5.0000	0.0000
22.	Overall the quality of my TA's teaching is:	0	0	0	0	7	0	5.0000	0.0000

Self-reported Info about Student:

23.	Your interest in taking the course before you enrolled	1	2	1	2	1	0	3.0000	1.4100
24.	Your effort to learn in this course (studying, doing assignements, thinking about ideas)	0	0	1	2	4	0	4.4300	0.7900
25.	The amount that you have learned in the course thus far	0	0	0	1	6	0	4.8600	0.3800

Average Standard Dev

College of Agriculture and Life Sciences
Office of Academic Programs
Student Appraisal of Teaching Assistant

FALL 2015

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

Student Comments

Learned a great deal in this section- definitely more than the lecture material. I really appreciate Jake's efforts in making the section very enriching. The section stimulated my interest in evolution- I only wish I had figured it out sooner!

Participating in the WIM program for BIOEE1780 was one of the best academic decisions I have ever made. Jake did an amazing job running the program and really sparked my interest in evolutionary biology.

Although I was weary to enroll in the writing in the major section of this course, I can honestly say it was one of the best decisions I have ever made. Not only has Jacob Berv presented the material in a way that both stimulates the students' interest and teaches the material in a conducive manner, but he has also gone above and beyond making sure that each individual student has time to meet with him and truly understand the topics of the course completely. Coming into this course I was originally apprehensive about learning topics of evolutionary biology, but leaving I can honestly say Jacob Berv has stimulated an interest in the subject that will last for a lifetime.

One thing that may help him improve as a TA is to organize his teaching schedule for each day and make sure to stick to it. A lot of times we would go off on tangential conversations (which were not necessarily bad, but still weren't always the most focused). Also, when calling on people, perhaps try to not make it so "fair" and just choose people to talk. A lot of times it would be that he would call on someone and then realize they talked two turns ago, and then call on someone else afterwards, making the whole process take more time. Overall I enjoyed the course and he was a great TA and very knowledgeable about the subject.

Very enjoyable and interesting way to learn about evolution. Jake was a friendly, helpful, and knowledgeable TA who clearly displayed his passion and interest for the subject. I am glad that I chose to take the Writing in the Majors section of this course.

Jake falls right inline with my comments about this course as a whole: amazing. Jake took a course I had very little interest in and made it one of my favorite courses. Jake provided an outlet to think far, deep, and wide about really convoluted topics in Evolutionary Biology. Consequently, I learned everything taught in the track I sections as a mere byproduct of our discussions of deeper topics. Even though this is the only evolutionary biology course I have taken; I feel capable of entering graduate studies because of how good of a course Jake put together. I have never had a graduate TA with a better teaching philosophy; Jake is truly an anomaly among his peers, and he has a very bright future as a professor.

Jake is great!! I'm so happy I took this section!

College of Agriculture and Life Sciences
Office of Academic Programs
Student Appraisal of Teaching Assistant

FALL 2018

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

Gender

2	Male
4	Female
1	Declined

Student Year

0	Freshmen
2	Sophomores
3	Juniors
0	Seniors
0	Grad Students
0	Other/Declined

School or College

4	Ag & Life Science
0	Arch, Art & Plan
2	Arts & Sciences
0	Engineering
0	Hotel
0	Human Ecology
0	ILR
0	Unclassified/ExMu
0	Graduate School
1	Declined

Course Intended/Required for Major

5	Yes
0	No
0	Undecided
2	Declined

Approximate Grade in Course

4	A	0	D	0	U
2	B	0	F	1	Declined
0	C	0	S		

Approximate Cum Average

1	4.0	0	2.5	0	1.0
2	3.5	0	2.0	0	n/a
3	3.0	0	1.5	1	declined

Average is:

6	Cornell Ave.
0	Transfer Ave.
1	Declined

Reason for Taking Course

6	Required for Major	0	Required for Grad Work
1	Has Great Reputation	0	Other
1	Subject Matter of Interest		

1=very low or never; 2=low or rarely; 3=medium or sometimes; 4=high or frequently; 5=very high or always

		Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	No Resp.	Mean	Std. Dev.
8.	Seems knowledgeable in the subject matter	0	0	0	0	6	1	5.0000	0.0000
9.	Is well prepared for class	0	0	0	1	5	1	4.8300	0.4100
10.	Uses class time efficiently	0	0	0	2	4	1	4.6700	0.5200
11.	Stimulates deeper thinking about the subject	0	0	0	1	5	1	4.8300	0.4100
12.	Makes me feel free to ask questions	0	0	0	1	5	1	4.8300	0.4100
13.	Provides clear and comprehensive explanations	0	0	0	3	3	1	4.5000	0.5500
14.	Communicates interest in helping students learn	0	0	0	1	5	1	4.8300	0.4100
15.	Is willing to help students outside of class	0	0	0	1	5	1	4.8300	0.4100
16.	Coveys enthusiasm in teaching the material	0	0	0	1	5	1	4.8300	0.4100
17.	Is organized in presenting the material	0	0	2	0	3	2	4.2000	1.1000
18.	Involves everyone in class	0	0	0	1	4	2	4.8000	0.4500

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FALL 2018

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

1=very low or never; 2=low or rarely; 3=medium or sometimes; 4=high or frequently; 5=very high or always

		Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	No Resp.	Mean	Std. Dev.
19.	Grades Equitably	0	0	0	5	1	1	4.1700	0.4100
20.	Comments on my work in ways that help me learn	0	0	2	1	2	2	4.0000	1.0000
21.	Realizes when students do NOT understand	0	1	1	1	3	1	4.0000	1.2600
22.	Overall the quality of my TA's teaching is:	0	0	0	2	4	1	4.6700	0.5200

Self-reported Info about Student:

23.	Your interest in taking the course before you enrolled	1	2	1	2	0	1	2.6700	1.2100
24.	Your effort to learn in this course (studying, doing assignements, thinking about ideas)	0	1	0	4	1	1	3.8300	0.9800
25.	The amount that you have learned in the course thus far	0	0	2	1	3	1	4.1700	0.9800

Average Standard Dev

College of Agriculture and Life Sciences
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FALL 2018

Course
BIOEE 1780 DIS 219

Instructor
Jacob Berv

Student Comments

N/A

Jake was a great TA. My only complaint is that he is too smart for his own good as a TA. He is so many lightyears beyond us in knowledge that sometimes it hurts his ability to explain really simple concepts to us. However, he is always able to help us apply what we learned in class to bigger concepts. Being in his WIM section has taught me more about the applications of Bio and the concepts we are learning in class than any other section. Overall, I had a great time in Jake's class. Anyone who doesn't try to take this class is a fool. It is by far one of the best decisions I've made at Cornell, thanks Jake :)

Jake has been a phenomenal TA for this class. I feel so fortunate to have had the ability to take this class with him as an instructor; I truly feel that I have been able to engage with topics relating to evolutionary biology on a deeper level.
Jake's assignments have all been fair and interesting. Sometimes, I wish he had been more clear about his grading criteria: it's challenging for us, as sophomores and juniors, to write sophisticated papers regarding complicated (yet fundamental) topics in evolutionary biology at the same level as him.
Overall, I would highly recommend this class and wish Jake the best with all his future endeavors.

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best TA ever, great discussions twice a week even though he was busy with PhD stuff, went above and beyond for the class

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