

Philosophy of Biology

PHIL 272: Spring 2014

Thursdays 7–9:52 PM

<http://moodle.bucknell.edu/course/view.php?id=11606>

Vaughan Literature Building 201

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office hours: M/W 2–3:30PM (and by appointment)

Course Content Are species real? Is there a single objective tree of life? What are the units of natural selection? What are functions? Is there such a thing as evolutionary progress or is the structure of life on earth purely contingent? If so, could there yet be “natural laws” within biology? How much can evolutionary theory inform us about ourselves and our societies? Is race a biological reality or a social construct? Is there such a thing as “human nature” or are we blank slates to be inscribed by culture? Is the environment intrinsically valuable? Questions like these continue to divide philosophers and biologists alike — we shall engage them primarily through current philosophical and biological research. The course will primarily function as a seminar, with student presentations setting the tone and directing the discussion, though lecture will sometimes intrude.

Learning Goals In successfully completing this course, you should:

- ✦ Gain a familiarity with some of the central issues of philosophical interest in biology.
- ✦ Develop skill in researching and presenting on complex topics in a compelling fashion.
- ✦ Develop skill in constructing and evaluating argumentation;
- ✦ Gain a general appreciation of the fundamental ambiguities and complexities involved in the human attempt to answer questions about knowing, valuing, and living.

Readings Most readings will be made available in PDF on Moodle. *Please bring printed copies of these to class.* There is one assigned book for the course: *Are Species Real?* (Palgrave–Macmillan, 2013), by me. To avoid any hint of conflict of interest, I will donate the expected royalties for each newly-purchased book to the Galápagos Conservancy.

Evaluation

Your final grade will be based the various weighted components described below. Note what the different letter grades represent. According to the Course Catalog (<http://www.bucknell.edu/catalog.xml>), an ‘A’ means ‘Superior achievement’, a ‘B’ means ‘High pass’, a ‘C’ means ‘Pass’, a ‘D’ means ‘Low pass’, and an ‘F’, of course, stands for ‘Failing work’.

Participation & Professionalism (25%) To begin with the obvious: you should come to every class meeting (particularly important for a once-a-week class). Missing class will have serious repercussions for your final grade. However, merely showing up and looking attentive will not secure a good grade on this component of the course. Rather, I expect you to be an engaged and informed participant. Break the ice. Ask questions. Respond to your peers. Own up to your confusion/puzzlement. There will be a lot of fairly dense and abstract reading for this course. I expect you to do it — all of it — and do it well. *I’m serious about this.* Saving everything for the last minute will not work. You’ll probably even need to read some things a couple of times to get to the level of preparedness I am expecting. Your highlighter is not a magical brain–paper interface device. Read actively! Take notes; mark up your books/papers; keep a journal. In short: critically engage with the reading and come to class ready to share the fruits of your labors.

I will generally post supplemental/background/further reading for each topic that I think you’d benefit from examining. I ask you to read these at least occasionally and definitely for any meeting in which you are presenting (see below). In general, think of your interaction in the class as analogous to expectations you’d face in most workplaces. You should show up to each meeting on time, prepared (both cognitively and materially), and remain present and attentive for the entire time (worry not: I will provide two bathroom/stretching breaks). Computers, phones, tablets, and other electronic marvels should be silenced and put away.

Quizzes (10%) I will occasionally begin class — or a segment thereof — with an unannounced, short (<10 minute) quiz. These may address concepts/issues/theories we covered last week (thus it is in your interest to make sure that you are clear on these — ask questions and see me in office hours as needed) or concern issues from the reading assigned for that class (at a more basic level). Your lowest quiz score will be dropped.

Research Essay(s) (25%) You have the option of writing one long essay (3,000–5,000 words) or two shorter essays (1,500–2,500 words) on topics of your choosing — subject to my approval. If you select the two-essay option, your first essay must be submitted by **March 7th**, your second by **May 1st**. If you select the one-essay option, you'll just be subject to the final deadline. Do not construe these deadlines as suggestions of when you should turn your essay(s) in; I am happy to read them earlier and will usually be able to provide more detailed comments in that case (in addition to being in a better mood!).

Essays in either option should have a research component, meaning that they will interact with high-quality sources (in a non-trivial way) that were not assigned by me (either as required or supplemental) in addition, I'd suppose, to those sources that *were* assigned by me. You will have ample opportunity to revise your drafts and conference with me, so my expectations for these essays will be high. If you initially select the two-essay option, you may switch to the one-essay option (up to the 5/1 deadline), possibly incorporating a revised version of your first essay into the longer one. You may not do the reverse switch, however. If you miss the deadline for the first essay, you're committed to the longer one.

In-Class Presentations (20%) Over the course of the term, I will ask each student to give two *short* (5–10 minute presentations) on some topic that coheres with the topic for that meeting. I will attempt to assign presentation dates according to your preferences and in an attempt to balance the number of presentations per meeting. Your presentation should address at least one of the assigned readings — again, not merely summarizing it, but offering your considered take on it given the benefit of further thought and research. You may want to critically evaluate a particular reading's argument, describe and analyze a relevant case-study or further lines of research (in either biology or philosophy), or use the presentation as an occasion for getting feedback on an argument/position from your research essay. I will assign $\frac{2}{3}$ weight to your better presentation.

Out of Class Discussion (20%) We will use a Moodle discussion board to keep our discussion going between meetings. Rather than just open this up as a free-for-all, I will impose a little structure. You will be partitioned into two groups (X and Y); in a given week, one group will have “kickoff” responsibility, the other can relax a bit. Let's say it's after the first meeting and group X is up; members of X will kick off the discussion by posting (or replying) at least once by Monday morning at 9AM. Members of Y may post or reply at any point during the week. All posting for a week will be evaluated starting at 4PM on Thursday. What I am looking for: open-minded, evidence/argument-centered engagement with the issues raised in the texts and brought up in our discussion; be responsive to your peers and respectful of other viewpoints; quality \neq quantity. Aim for three posts or replies per week; more or less is acceptable if they have the substance to match. You may feel free to keep issues we've just discussed on the table; I would ask that (a) you conduct it in the *next week's* forum and (b) that the majority (say, around two-thirds or three-quarters) of your posting activities pertain to forthcoming topics.

A given week's posting will be graded on a 0–3 basis, where 0=“Insufficient/Incomplete”, 1=“Getting There”, 2=“Good; Meets my Expectations”, 3=“Exceeds My Expectations”. I will drop your worst two weeks of postings, average the rest, and curve things so that an average of 2.0 lands on a B/B+.

Policy on Late Work I will only offer extensions/makeups on quizzes/presentations in case I hear about a legitimate reason for needing to miss class *before class*. Do not assume that retrospective excuses will be granted (they rarely will); do not assume our understandings of ‘legitimate’ match. Late essays will be penalized by $\frac{1}{3}$ of a letter grade per partial day late.

Office Hours You are invited and encouraged to supplement your in-class learning by visiting me in my allotted office hours or at some other time that suits us both. You don't need an appointment to come to office hours — just drop by. You can also contact me via Skype (my username can be found on our Moodle page); if you see me online, you may assume that I'm happy to chat.

Academic Honesty I expect you to abide by Bucknell's Honor Code (<http://www.bucknell.edu/x1324.xml>). I will not hesitate to refer students who are suspected of academic dishonesty to the University Board of Review (<http://www.bucknell.edu/x1337.xml>).

Reasonable Accommodations If you have a disability that may affect your performance in this course, please talk to me (either by email or in person) at your earliest convenience and I will make every effort to accommodate your needs. If you have not yet spoken with Director of Disability Services about your disability (<http://www.bucknell.edu/DisabilityServices/>), please do so as soon as possible. Accommodations must be sanctioned by that office.

Tentative Schedule of Topics & Assignments

- January 16 **1. Biology, Meet Philosophy; Philosophy, Meet Biology**
In this first (substantive) meeting, we will begin to consider the role that philosophical reflection can take in the context of biology. What is it to do philosophy? What can philosophers offer biologists? How can biologists start to think philosophically? On the other side of this coin, philosophers might wonder how biology (or any of the sciences) should influence their thinking. We'll start trying to answer these questions by applying a historical perspective to biology. When did it start? What is its subject matter, its assumptions, its methods, its main questions — and how have these changed over time?
- January 23 **2. Conceptual Issues for the Modern Synthesis**
Our second meeting will continue tracing the evolution of biology into the “Modern Synthesis” (of evolutionary biology and population genetics) into the mid-20th century. We'll focus in particular, on three conceptual thicket: the concept of fitness, the pervasiveness of adaptation (to what extent is natural selection an “optimizing” force?), and the concept of biological function in a mechanistic worldview.
- January 30 **3. Lecture by Neil deGrasse Tyson / Post-Lecture Discussion**
Since this awesome astrophysicist/science-communicator will be speaking on campus during our course, we will go as a group to his lecture and meet afterwards to continue the discussion. More topic details will be announced.
- February 6 **4. Life & Development**
We'll focus on two somewhat distinct topics in this meeting: (1) a big set of questions about how we should think of life — what is it?, how did it arise in the first place? — and (2) whether our understanding of development should unseat the prevalent understanding of evolution and the relationship between genes, organisms, and environment.
- February 13 **5. Human Nature**
Continuing the theme of whether genes in any relevant sense “determine” organisms, we'll turn to the perennially-debated question of whether there is such a thing as “human nature”. How stands the “nature/nurture” debate these days? How are biological sex and gender related? What is the status of Evolutionary Psychology (a trendy but controversial school of psychological research that often concerns itself with these questions)?
- February 20 **6. What are Species?**
Are species objective features of the world or merely artifacts of how we choose to divide up the world. This is the first of three meetings we will spend on the so-called “Species Problem” — the problem of how to define species — and a number of associated questions. Our focus will be on understanding the basic philosophical issues connected with classification in general and what the major schools of thought are about species in particular.
- February 27 **7. Shaking the Tree of Life** (remote-class: I will Skype in from a conference)
We will continue pursuing various approaches to the question of whether species are real and will consider the relevance of certain discoveries in microbiology on the thesis that there is a single, objective “tree of life”.
- March 6 **8. Pluralism and Realism about Species**
In our final meeting on species, we'll consider an approach that treats them as natural kinds without going in for essentialism and think about whether multiple species concepts might, in some sense, be right. This view is called ‘pluralism’; is it compatible with the thesis that species are genuine, objective features of the world?
- March 13 *Spring Break*

March 20 *TBD: Matthew traveling for research.*

March 27 **9. Race**

Another area of intense interest and dispute has centered on the question of whether there is any biological reality behind the concept of race. Some scholars argue that the study of human evolution offers us a phylogenetic race concept; others argue that a careful study of human biology shows that race is at best a merely social kind (and, at worst, a pernicious fiction). Who's right?

April 3 **10. The Environment**

What do ecology and evolutionary theory tell us about the nature of the environment? Is (or was) there a "balance of nature"? Does it make sense to conserve or restore wilderness areas or try to prevent species from going extinct? Do we have any duties to the preserve the environment?

April 10 **11. Biodiversity**

The question of how to understand the much used term 'biodiversity' inherits many of the difficulties of the species problem but raises new ones as we consider questions of how to assess and prioritize different areas of concern for biodiversity? How is biodiversity related to ecological stability?

April 17 *TBD: Matthew traveling for research.*

April 24 **12. Evolutionary Progress & Contingency**

Is evolutionary change in any way progressive? Does it, for instance, trend toward greater complexity or is it a directionless wander? How contingent are the products of evolution? What, if anything, does this imply about existence of distinctively biological laws?