Syllabus

Philosophy 4196-10

Philosophy of Biology

TTh 2:20-3:35
2020 K St., Rm 12

Professor Eric Saidel

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Office Hours
Tues/Thurs 1:10-2:10
or by appointment

522 Phillips

Overview

It has been 150 years since Darwin published *The Origin of the Species* and overturned the science of biology. The Twentieth century saw the discovery of the gene, the double helix model, and the Neo-Darwinian Synthesis. One could very accurately describe the current era as the Darwinian Age. But what exactly does Darwin claim about the origin and evolution of species? What, for that matter, is a species? How does evolution work? Does "survival of the fittest" mean that the best will flourish? These are some of the questions that philosophers of biology ask. We will strive to better understand evolutionary theory, and then to see what light it can shed on other areas, including our understanding of our own place in nature, and what it can or cannot explain about our characters, as well as core philosophical issues such as the nature of scientific explanation and the relation one scientific theory may have to another.

By the end of the semester students will have a solid understanding of the workings of evolutionary theory, and they will be able to think critically about issues in the philosophy of biology as well as about these issues as they arise in both public debate and in other academic areas.

Warning

This course is not an introductory level course. We will be reading and you will be expected to master some philosophically difficult material. Class will be spent discussing the material. You will be expected to come to class with a basic understanding of the arguments made by the authors we are reading.

While the readings in this class can be dense and technical, they require no background in biology. However, a familiarity with biology can only be helpful. Similarly, while no particular familiarity with the philosophy of science is prerequisite for this course, such experience would

certainly help.

Texts

Elliott Sober, *Philosophy of Biology* Westview Press, 2nd edition.

Massimo Pigliucci and Jonathan Kaplan, *Making Sense of Evolution* University of Chicago Press.

Elliott Sober, ed., *Conceptual Issues in Evolutionary Biology* Bradford Books, 3rd edition.

Expectations and Assignments

Students will come to class each day having read the material assigned for that day and prepared to discuss that material. 10% of the class grade will be based on **participation**.

Each week, students will write a **one page paper** on an issue raised in the reading assigned for that week. These papers will be due before class on the day the reading is assigned. These papers are each worth 3% of the final grade (for a total of 30%). (This allows you to skip 3 of the one page papers.)

The remaining 60% will be based on **longer papers**. Students will write 3 7 page papers, each worth 20% of the final grade. Each paper will be on one of the 4 "issue units" (Units 2-5), and will be due on the Tuesday one week after completion of the unit. (For example, if you wish to write on " Adaptationism" and we complete that unit on Thursday, February 24, then your paper will be due on Tuesday, March 6.) You will have your choice about which 3 of the 4 units you make the focus of your longer papers.

Learning Outcomes

This course fulfills one of the *analytical approaches* required in the General Education Curriculum of the University: *Critical Thinking*. Critical Thinking involves analyzing and evaluating abstract information; understanding and analyzing scholarly literature and argument; and formulating logical arguments based on that analysis. This course requires students to demonstrate these skills in the following ways:

Analyzing and evaluating abstract information

Students analyze and evaluate philosophical theories about evolution and about scientific reasoning and explanation. This analysis engages with the scientific data as well as with the theoretical evaluation of the data.

Understanding and analyzing scholarly literature and argument, **particularly with respect to theoretical orientation and sources of support**

Students are required to interpret contemporary philosophy of biology texts, and to engage critically with them. Required texts include both primary and secondary literatures and represent a range of contrasting philosophical positions and schools of thought. Students must demonstrate comprehension of the arguments presented in these texts in their contributions to class discussions and in their written work.

Formulating logical arguments based on their analyses

Students are required to construct logical arguments of their own, building upon and reacting to their analyses of arguments in the scholarly literature of the philosophy of biology.

The instructor assesses student development of these skills by two means: 1) The formal written work, as described above, and 2) in-class discussion, including student questions and student responses to questions asked by the instructor during each class meeting.

Cell Phones and Computers

Cell phones and laptop computers are wonderful things. But cell phones do not belong in class. Turn your phone off when class starts. This means that you should not be using your phone to send or receive texts or to send or receive phone calls, among other uses. Nor should your phone ring during class. If you do use your phone during class (or if it rings), you will be asked to leave class. If this happens twice, turning in your phone at the beginning of class will become a condition for attending class.

If you wish to use your laptop for taking notes during class, that is fine. Other uses of your laptop are inappropriate.

Academic Honesty

A word about Academic Honesty. I encourage you to work with others on your homework assignments, but don't let your friends do the assignments for you; your grade will suffer. By handing in something with your name on it, you are stating that it is your work. Make sure that statement is true. All your work is to be completed in conformance with The George Washington University Code of Academic Integrity.

Class Schedule

Some notes about the schedule

This schedule is tentative and subject to change, depending upon our progress through the material. Exact reading assignments will be given in class. It is your responsibility to make sure you know what the assignment is for each class, and to complete that assignment. In most cases we will *not* read all of the selections listed below.

Our semester will be proceed roughly as follows: we will first have a general introduction to Evolution, followed by discussions of various issues, each of which will include a "case study."

Texts

Elliott Sober, *Philosophy of Biology* (PB)
Massimo Pigliucci and Jonathan Kaplan, *Making Sense of Evolution* (P&K)
Elliott Sober, ed., *Conceptual Issues in Evolutionary Biology* (CI)

Schedule of Readings

Unit 1: Introduction to Evolution

Week 1 (Jan 17-19): What is Evolution?

Sober: Chapter 1, " What is Evolutionary Theory" (PB)

Pigliucci and Kaplan: Chapter 1, "Natural Selection and Fitness" (PK)

Weeks 2-3 (Jan 24 - Feb 2): What is Fitness?

Sober: Chapter 3, " Fitness" (PB)

Mills and Beatty: " The Propensity Interpretation of Fitness" (CI)

Sober: "The Two Faces of Fitness" (CI)

Unit 2: Adaptationism

Weeks 4-5 (Feb 7-16): Adaptationism

Sober: Chapter 5, "Adaptationism" (PB)

Pigliucci and Kaplan: Chapter 6, "Functions and For-Ness in Biology" (PK)

Gould and Lewontin: "The Spandrels of San Marco" (CI)

Maynard Smith: " Optimization Theory in Evolution" (CI)

Pigliucci and Kaplan: Chapter 5, "A Quarter Century of Spandrels" (PK)

Week 6 (Feb 21-23): Adaptationism case study: Female orgasm

Selections from Lloyd, *The Case of the Female Orgasm* (electronic reserves)

Unit 3: Units of Selection

Week 7-8 (Feb 27 - March 8): Units of selection

Sober: "The Units of Selection Problem" (PB)

Pigliucci and Kaplan: Chapter 3 "The Targets and Units of Selection: Individual Events and Population Dynamics" (PK)

Williams: Excerpts from *Adaptation and Natural Selection* (CI)

Wilson: " Levels of Selection: An Alternative to Individualism in Biology and the Human Sciences" (CI)

Week 9 (March 20-22): Units of selection case study: The Evolution of Altruism

Sober and Wilson: excerpts from *Unto Others* (electronic reserves)

Unit 4: Scientific Explanation

Weeks 10-11 (March 27 - April 5): Explanation in Biology

John Beatty: "The Evolutionary Contingency Thesis" (CI)

Sober: "Two Outbreaks of Lawlessness in Recent Philosophy of Biology" (CI)

Machamer, Darden, and Craver: "Thinking About Mechanisms" (electronic reserves)

Week 12 (April 10-12): Can Biology be Reduced to More Basic Science?

Kitcher: " 1953 and All That: A Tale of Two Sciences" (CI)

Waters: "Why the Antireductionist Consensus Won't Survive the Case of Classical Mendelian Genetics" (CI)

Unit 5: Evolutionary Explanations of Psychological Facts

Weeks 13-14 (April 17-26): Psychologizing Darwin

Sober: Chapter 7: " Sociobiology and the Extension of Evolutionary Theory" (PB)

Pigliucci and Kaplan: Chapter 7: "Testing Adaptive Hypotheses: Historical Evidence and

Human Adaptations" (PK)

Tooby and Cosmides: "Toward Mapping the Evolved Functional Organization of Mind and Brain" (CI)

Buller: " Evolutionary Psychology: A Critique" (CI)