PHIL 415 / 510 – Philosophy of Biology
Winter Term 2014
Tue, Thu 2:00–3:20 pm, Assiniboia Hall 1-26

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Office hours: by appointment
Webpage at https://eclass.srv.ualberta.ca

A. Course overview and aims

To some extent, philosophy of biology pursues questions from general philosophy of science in the context of biology (e.g., what is a scientific theory, how are theories confirmed, what is a scientific explanation, is there a logic of discovery). But typically, philosophy of biology addresses a variety of conceptual questions that arise from within biology and are peculiar to that domain (e.g., what is the unit of selection, what is the nature of species, can biology be reduced to molecular biology). Philosophy of biology as a discipline is currently thriving within philosophy of science (and philosophy in general), largely because the biological and biomedical sciences it studies have attained a major importance for science and society.

The aim of this class is to cover most major topics in contemporary philosophy of biology. Some pertain to evolutionary biology, which has been the philosophical focus in the recent past (e.g., the nature of species, different species concepts, the units of selection debate, adaptationism and evolutionary psychology, teleology and functional explanation). Other issues are about molecular and developmental biology, which has gained prominence in recent philosophical discussions (e.g., reductionism and interdisciplinary research, gene concepts, the idea of genetic information). We shall also take a look at evolutionary developmental biology (‘evo-devo’) – a recent and one of the most interesting fields in current biology.

To this end, we will read and discuss influential original articles written by philosophers or biologists during the last three decades (grouped around several core topics, see Section G).

B. Prerequisites

The class is organized such that background knowledge in biology or philosophy of science is not required, though interests in either field are desirable. Formal prerequisite: to take the class as an undergraduate (PHIL 415), you must have previously completed two philosophy classes (including one class at the 200-level or higher) or obtain my permission.

C. Required texts

The required readings consist in journal articles and book chapters, and are listed below in Section H. Most of the readings can be accessed online via our course website.

D. Course requirements

- Term paper(s) 70%
- Oral presentation 20%
- Participation 10%

**Term paper(s) (70%):** You must write either one long term paper, worth 70% of credit, or two short term papers, each of which is worth 35% of credit. An electronic version of the long term paper is due on Saturday, April 19 at 2 pm. If you choose the second option, an electronic version of the first short paper is due on February 25 at 2 pm, and the second one is due on April 19 at 2 pm.

Approximate length of a long paper: 4000–5000 words if you are an undergraduate student (signed up for PHIL 415); 5000–7000 words if you are a graduate student (PHIL 510).

Approximate length of each short paper: 2000–2500 words if you are an undergraduate student; 2500–3500 words if you are a graduate student.

I am happy to provide comments on term paper drafts. In the case of the long paper and the 2nd short paper, I guarantee comments if you send me an electronic draft by April 12.

**Oral presentation (20%):** Every student has to give one oral presentation. Your task as a presenter is to briefly summarize this meeting’s readings (highlighting points that you find particularly relevant) but primarily to start the discussion by having prepared some questions (e.g. about problematic issues in the readings). Alternatively, you may present on other material that is relevant to our topic. In either case, I ask you to (a) prepare a short handout and email me a draft in advance so that I can provide comments, and to (b) make copies of the final version for the whole class, so that everyone has a summary of your presentation. You may give your presentation using PowerPoint (and use a printout of the slides as a handout).

**Participation (10%):** Attendance and active participation is important for this class. It is the responsibility of each student to come to class prepared to actively engage in discussion. Each of you will probably have picked up different points from the readings or have questions or objections, so please share them! You can also obtain participation credit by starting topics and replying to posts at the discussion forum on our website.

E. Academic integrity and plagiarism

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards and to uphold the policies of the university in this respect. Students are urged to familiarize themselves with the Code of Student Behaviour (http://tinyurl.com/CodeofStudentBehaviour) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the university. For a summary please see http://www.governance.ualberta.ca/en/StudentAppeals/DontCheatsheet.aspx

The Code of Student Behaviour defines plagiarism as follows:

No Student shall submit the words, ideas, images or data of another person as the Student’s own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

The library has a general website on plagiarism: http://www.library.ualberta.ca/guides/plagiarism. See in particular the section on “Avoiding Plagiarism” (sidebar on the left, among “Resources for Students”).
F. Course website
The course has a website at https://eclasssrv.ualberta.ca. Our assigned readings and additional literature can be accessed from this site, and I use it to post presentation handouts. The site also contains a discussion board.

G. Schedule of classes

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
</tr>
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<tbody>
<tr>
<td>Jan 7</td>
<td>Introduction</td>
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| Jan 9  | Gene concepts 1. Waters “Genes made molecular.”  
[optional: Sex and Death, sections 6.2–6.5] |                                                                          |
| Jan 14 | Gene concepts 2. Griffiths and Stotz “Gene.”  
Moss What Genes Can’t Do, pp. 44–50. |                                                                          |
| Jan 16 | Reduction 1. Schaffner “Reductionism in biology.”  
Hull Philosophy of Biological Science, pp. 30–44.  
[optional: Sex and Death, section 6.1] |                                                                          |
| Jan 21 | Reduction 2. Fodor “Special sciences.”  
[optional: Sex and Death, chapter 7] |                                                                          |
| Jan 23 | Integration 1. Darden “Relations among fields.” |                                                                          |
| Jan 28 | Integration 2. Bechtel “The downs and ups of mechanistic research.” |                                                                          |
| Jan 30 | Genetic information 1. Maynard Smith “The concept of information in biology.” |                                                                          |
Laubichler and Wagner “How molecular is molecular developmental biology?”,  

Reading week

Griffiths “Squaring the circle,” pp. 209–212, 215–223. | 1st short term paper due at 2pm |
[optional: Sex and Death, sections 9.1–9.2] |                                                                          |
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<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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<tbody>
<tr>
<td></td>
<td>[optional: <em>Sex and Death</em>, chapter 3]</td>
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<tr>
<td>Mar 11</td>
<td>Levels of selection 2.</td>
<td>Okasha “Why won’t the group selection controversy go away?”</td>
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<td></td>
<td>[optional: <em>Sex and Death</em>, section 9.4]</td>
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<td>[optional: <em>Sex and Death</em>, chapter 4]</td>
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<td>[optional: <em>Sex and Death</em>, chapter 10]</td>
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<td>Mar 20</td>
<td>Adaptationism 2.</td>
<td>Buller “Evolutionary psychology: a critique.”</td>
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<td>Griffiths “What is innateness?”</td>
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<tr>
<td></td>
<td>[optional: <em>Sex and Death</em>, chapter 13]</td>
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<tr>
<td>Mar 25</td>
<td>Evo-devo 1.</td>
<td>Amundson “Two concepts of constraint.”</td>
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<tr>
<td>Mar 27</td>
<td>Evo-devo 2.</td>
<td>Hendrikse et al. “Evolvability as the proper focus of evolutionary developmental biology.”</td>
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<td></td>
<td>Gerhart and Kirschner “The theory of facilitated variation.”</td>
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<td>Apr 1</td>
<td>Evo-devo 3.</td>
<td>Robert “How developmental is evolutionary developmental biology?”</td>
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<td></td>
<td>[optional: <em>Sex and Death</em>, chapter 5]</td>
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<tr>
<td>Apr 3</td>
<td>Evo-devo 4.</td>
<td>Wagner “What is the promise of developmental evolution? Part I.”</td>
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<td>Apr 8</td>
<td>Wrapping up.</td>
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<tr>
<td>Apr 19</td>
<td>Long term paper / 2nd short term paper due at 2 pm.</td>
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In this schedule, *Sex and Death* refers to the optional textbook listed in section C; bibliographic details on the other readings can be found in Section H. I recommend reading the optional material if you give a presentation or write a term paper on the respective topic, or if you wish to have broader overview of the issue and relevant background.

**H. Bibliography of required readings**


I. Further relevant literature

While additional journal articles can be accessed via our course website (e.g., for the purpose of term papers), here are further relevant books.

**Textbooks:**


**Companions:**


Ayala, F. and R. Arp (Eds) (2010) *Contemporary Debates in Philosophy of Biology*. Wiley-Blackwell.  [On several topics, there is each one essay arguing for and one essay arguing against a thesis.]


**Anthologies:**


Other books:


