

PHIL 317 – Philosophy of Biology

Winter Term 2025

Tue, Thu 11:00–12:20, [ED 176](#)

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A. Course overview

This course is an introduction to philosophy of biology, suitable for philosophy students and for biology students, among others. Philosophy of biology addresses and contributes to a variety of conceptual and methodological questions that often arise from within biological science.

This class will address issues pertaining to evolutionary, developmental, and molecular biology, focusing in particular on the role of genes in development and evolution and different kinds of explanations bearing on evolutionary biology. The strategy is to develop these issues based on comparing and contrasting two popular science books: *The Selfish Gene* deals with the evolutionary explanation of behaviour and presents a neo-Darwinian approach as it was prevalent a few decades ago, emphasizing the centrality of genes. *The Plausibility of Life* approaches evolution from the point of view of evolutionary developmental biology ('evo-devo')—a fairly recent field and one of the most thrilling approaches in current biology. This second book accords to genes a less dominant role in the explanation of evolution, and our task will be to understand how the neo-Darwinian and evo-devo explanations differ from and relate to each other.

The discussion of these books in class will be complemented by lectures that cover relevant topics and notions from philosophy of biology (so as to give an overview of some main ideas of the field) or that fill in some necessary background in biology and its history. Topics to be covered include genetic information, species concepts, adaptationism, altruism and selfishness, sociobiology and evolutionary psychology, and intelligent design.

B. Course objective and expected learning outcomes

Students who successfully complete this class will

- have gained acquaintance with some current issues in the philosophy of biology,
- have gained knowledge about some core biological concepts and about the role of genes in development and evolution,
- be able to identify different kinds of explanations used in biology,
- have developed skills that will enable them to think more clearly and critically about (popular) biological texts, and
- have (hopefully) acquired an interest in pursuing philosophical issues about biology.

C. Prerequisites

There are no formal prerequisites for this class. The class is organized such that background knowledge in philosophy or biology is not required, though interests in either field are desirable.

D. Required texts

Richard Dawkins, *The Selfish Gene*, 40th anniversary edition. Oxford University Press, 2016. (Available at the UofA bookstore in the SUB and as an [ebook at our library's digital collection](#). An older edition works as well; only the page numbers differ.)

Marc Kirschner and John Gerhart, *The Plausibility of Life: Resolving Darwin's Dilemma*. Yale University Press, 2005. (Available at the UofA bookstore in the SUB and as an [ebook at our library's digital collection](#). We do not need this book until the second half of the term.)

E. Course requirements

- Midterm 20%
- Final 30%
- Book report 10%
- Essay 20%
- Leading discussion 10%
- Participation 10%

Midterm exam (20%): The midterm on **February 13** covers the material up to Feb. 11 and will consist of short answer questions (requiring you to explain in a few sentences a philosophical or biological concept), and long answer questions (requiring you to write a paragraph showing you have understood a philosophical issue).

Final exam (30%): The final on **Thursday, April 24** will consist of short answer questions and long answer questions. While emphasis will be placed on material covered in the second half of the course, the final will be cumulative.

Book report (10%): On **February 6 at 10am**, you have to submit a 2 page (double spaced) report on one of the books listed below in section H. The point of this task is to give you an idea of what some of the basic books in the field are and to make you take a look at (at least) one of them apart from the material we read in class. Among the books listed in section H, take a look at some of them in the library. Choose one of them that interests you in some way and read (at least) one of the chapters. Write a report on what you found of interest in that book. In evaluating the book report I am not looking for any deep reflections, but merely evidence that you have thought about your own interests in the class and that you have taken a look at a relevant book in addition to the required texts.

Essay (20%): On **Friday, March 28 at noon**, you have to hand in an essay (5–6 pages double-spaced). In the essay, you have to choose and critically discuss one issue from the required readings or the books listed in section H if you wish, making use of the philosophical notions you have learned in class. Guidelines and suggestions on possible topics will be distributed after reading week.

Leading discussion (10%): A group of 1-3 of you will be in charge of starting and leading the discussion on some of this meeting's readings. This includes that you jointly have prepared

some issues pertaining to our readings that we can discuss in class. Ideally, you will meet with me beforehand to go over the material for which you have responsibility and to talk about how to steer discussion (e.g., preparing a handout for you or slides for everyone). I will set up a sign-up sheet for the discussion leading calendar.

Participation (10%): Attendance and active participation is important for this class. Each class will normally intersperse lecture with general discussion of the readings. 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 contributing to the discussion forum on our website.

Letter / number grade conversion table

A+ 95–100	B+ 80–84	C+ 67–69	D+ 57–59	F 0–49
A 90–94	B 75–79	C- 63–66	D 50–56	
A- 85–89	B- 70–74	C- 60–62		

F. Course website

The course has a website at <https://eclass.srv.ualberta.ca>. I use the site to post lecture slides, discussion questions, study guides, and your grades. The site also contains our discussion board.

G. Schedule of classes

Tue, Jan 7	Introduction
Thu, Jan 9	Dawkins: Preface to 1 st ed; Chapters 1 and 2
Tue, Jan 14	Dawkins: Ch 3 (skip pp 51-56)
Thu, Jan 16	Dawkins: Ch 4
Tue, Jan 21	Dawkins: Ch 5 (skip pp 102-105)
Thu, Jan 23	Dawkins: Ch 6
Tue, Jan 28	Dawkins: Ch 7
Thu, Jan 30	Dawkins: Ch 8 (skip pp 176-181)
Tue, Feb 4	Dawkins: Ch 9
Thu, Feb 6	Dawkins: Ch 10. BOOK REPORT DUE at 10am
Tue, Feb 11	Dawkins: Ch 11. Review for the midterm
Thu, Feb 13	MIDTERM EXAM

Reading week

Tue, Feb 25	Kirschner&Gerhart: Preface; Introduction; Ch 1, pp 10-14
Thu, Feb 27	Kirschner&Gerhart: Ch 1, pp 15-37
Tue, Mar 4	Kirschner&Gerhart: Ch 2
Thu, Mar 6	Kirschner&Gerhart: Ch 3, pp 71-90
Tue, Mar 11	Kirschner&Gerhart: Ch 3, pp 91-108
Thu, Mar 13	Kirschner&Gerhart: Ch 4, pp 109-127
Tue, Mar 18	Kirschner&Gerhart: Ch 4, pp 128-142; Ch 5, pp 143-152
Thu, Mar 20	Kirschner&Gerhart: Ch 5, 153-176
Tue, Mar 25	Kirschner&Gerhart: Ch 6, pp 177-198
Thu, Mar 27	Kirschner&Gerhart: Ch 6, pp 199-218
	Friday, March 28 at noon: ESSAY DUE
Tue, Apr 1	Kirschner&Gerhart: Ch 7
Thu, Apr 3	Kirschner&Gerhart: Ch 8
Tue, Apr 8	Review for the final

Thu Apr 24	FINAL EXAM 8:30–10:30 am
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H. Books for writing reports on

A lot of recent short books have been coming out in the [Cambridge Elements in Philosophy of Biology series](#) (to which we have digital access). Many of them are useful for a book report.

Godfrey-Smith, P. (2014) *Philosophy of Biology*. Princeton University Press. [Pretty much the most recent textbook in philosophy of biology. No eBook, but hardcopy available at the library.]

Griffiths, P.E. and Sterelny, K. (1999) *Sex and Death: An Introduction to Philosophy of Biology*. University of Chicago Press. [No updated edition was produced, but still a highly recommended textbook in philosophy of biology. No ebook, but hardcopy available at the library.]

Garvey, B. (2007) *Philosophy of Biology*. Acumen Press. [One the more recent introductory textbooks. [eBook in our digital collection.](#)]

Sober, E. (2000) *Philosophy of Biology*. 2nd ed. Westview Press. [Good textbook in philosophy of biology. More mathematical and not as up-to-date as others, though, as it differs hardly from its first, 1993 edition. [Ebook in our digital collection.](#)]

Kampourakis, K. and T. Uller (2020) *Philosophy of Science for Biologists*. Cambridge University Press. [Very recent collection of useful overview essays. [eBook in our digital collection.](#)]

- Hull, D. and M. Ruse (Eds.) (2007) *The Cambridge Companion to the Philosophy of Biology*. Cambridge University Press. [Very good collection of essays surveying some main issues in philosophy of biology. [eBook in our digital collection.](#)]
- 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. [eBook in our digital collection.](#)]
- Hull, D. and Ruse, M. (eds) (1998) *The Philosophy of Biology*. Oxford University Press. [Collection of many classical, original articles by biologists and philosophers of biology. [eBook in our digital collection.](#)]
- Sober, E. (ed) (2005) *Conceptual Issues in Evolutionary Biology*. 3rd ed. MIT Press. [Another collection of many classical, original articles by biologists and philosophers of biology. [eBook in our digital collection.](#)]
- Keller, E.F. (2000) *The Century of the Gene*. Harvard University Press. [Popular discussion of the gene concept in contemporary molecular biology. Good account of the complexity of genetic processes and why the term 'gene' has partially ceded to many other genetic terms. [eBook in our digital collection.](#)]
- Morange, M. (2001) *The Misunderstood Gene*. Harvard University Press. [Popular discussion explaining many common misunderstandings of what genes are and how they work. No eBook, but hardcopy available at the library.]
- Roughgarden, J. (2009) *The Genial Gene: Deconstructing Darwinian Selfishness*. University of California Press. [An evolutionary biologist proposes social selection theory in opposition to sexual selection and the selfish gene theory. No eBook, but hardcopy available at the library.]
- Laland, K.N. and G.R. Brown (2011) *Sense and Nonsense: Evolutionary Perspectives on Human Behaviour*. Oxford University Press. [Accessible book, written by a biologist and a psychologist. [eBook in our digital collection.](#)]
- Buller, D.J. (2005) *Adapting Minds: Evolutionary Psychology and the Persistent Quest for Human Nature*. MIT Press. [A critique of evolutionary psychology. [eBook in our digital collection.](#)]
- Richardson, R. C. (2007) *Evolutionary Psychology as Maladapted Psychology*. MIT Press. [Another philosophical critique of evolutionary psychology. [eBook in our digital collection.](#)]
- Amundson, R. (2005) *The Changing Role of the Embryo in Evolutionary Thought: Roots of Evo-Devo*. Cambridge University Press. [While neo-Darwinists told a biased account of the history of biology, Amundson offers an evo-devo perspective that recovers useful features especially of pre-Darwinian biology. [eBook in our digital collection.](#)]
- Robert, J. (2004) *Embryology, Epigenesis and Evolution: Taking Development Seriously*. Cambridge University Press. [Recent book on the philosophy of developmental biology. [eBook in our digital collection.](#)]
- Weber, M. (2005) *Philosophy of Experimental Biology*. Cambridge University Press. [Good and recent book on the philosophy of molecular biology. [eBook in our digital collection.](#)]
- Beurton, P., Falk, R. and Rheinberger, H.-J. (eds) (2000) *The Concept of the Gene in Development and Evolution: Historical and Epistemological Perspectives*. Cambridge University Press. [A collection of recent essays by biologists and historians and philosophers of biology on the gene concept. [eBook in our digital collection.](#)]

I. Academic integrity, plagiarism, and AI tools

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](#) 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.

The Code of Student Behaviour defines plagiarism as follows ([summary](#)):

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.

Students should consult the information provided by the [Office of the Dean of Students](#) regarding avoiding cheating and plagiarism in particular and academic dishonesty in general. If in doubt about what is permitted in this class, ask the instructor. An instructor or coordinator who is convinced that a student has handed in work that he or she could not possibly reproduce without outside assistance is obliged, out of consideration of fairness to other students, to report the case to the Associate Dean of the Faculty (see the [Academic Discipline Process](#)).

The library also has [information on avoiding plagiarism](#).

In this course, our primary focus is to cultivate an equitable, inclusive, and accessible learning community that emphasizes individual critical thinking and problem-solving skills. To ensure a fair and consistent learning experience for all students, the use of advanced AI tools such as ChatGPT or Dall-E 2 is strictly prohibited for all academic (written/coding/creative/etc.) work, assignments, and assessments in this course. Each student is expected to complete all tasks without substantive assistance from others, including AI tools.

Any use of AI tools in your academic work may result in academic penalties and be considered an act of cheating and a violation as outlined in the relevant sections of the University of Alberta [Code of Student Behaviour](#).

J. Sexual Violence Policy

It is the policy of the University of Alberta that sexual violence committed by any member of the University community is prohibited and constitutes misconduct. Resources and more information can be found at <https://www.ualberta.ca/campus-life/sexual-violence>.

K. Student Services

The university provides various services, including [Student Accessibility Resources](#) (exam and classroom accommodations for students with a disability, chronic health condition, or anxiety disorders), the [Academic Success Centre](#) (e.g., note-taking and writing skills), [Writing Services](#) (writing support), [Health and Wellness Support](#) (including [Counselling & Clinical Services](#), the [Sexual Assault Centre](#), and the [First Peoples' House](#)), and the [Office of the Student Ombuds](#) (advice and support to students facing academic, discipline, interpersonal and financial difficulties).

L. Attendance, Absences, and Missed Grade Components

Regular attendance is essential for optimal performance in any course. In cases of potentially excusable absences due to illness or domestic affliction, notify your instructor by e-mail within two days. Regarding absences that may be excusable and procedures for addressing course components missed as a result, consult the “[Attendance](#)” and “[Examinations](#)” sections of the Academic Regulations of the University Calendar. Be aware that unexcused absences will result in partial or total loss of the grade for the “attendance and participation” component(s) of a course, as well as for any assignments that are not handed in or completed as a result.

M. Recording of lectures

Audio or video recording of lectures, labs, seminars, or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Recorded material is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the instructor.

The University of Alberta acknowledges that we are located on Treaty 6 territory, and respects the histories, languages, and cultures of the First Nations, Métis, Inuit, and all First Peoples of Canada, whose presence continues to enrich our vibrant community.

Policy about course outlines can be found in [Course Requirements, Evaluation Procedures and Grading](#) of the University Calendar.