

Course leaders:

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Center for Science Studies
Aarhus University

Philosophy of Biology

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Course material

You need to buy the following material from *Stakbogladen*:

- Sterelny, K. and P. Griffiths: *Sex and Death, An Introduction to Philosophy of Biology*, University Of Chicago Press, 1999

You will need to download reading material from our new electronic platform [BlackBoard](#) during the course.

Attendance

Students are expected to attend both the lectures and the seminars. Attendance in both the lecture and the seminars will be recorded.

Your duties for this course include the following ...

- There will be questions and discussions during the seminars *and* the lecture for you to maximize your learning effect. It is therefore vital that you attend the lectures and the seminars in order to succeed in this course.

Lecture queries:

- Each week, you need to answer a "*lecture query*", i.e., a question on the lecture material, half-a-page each; upload your queries to the relevant section on BlackBoard by **Friday at 5pm** each week; it is recommended that you write your query in English.
- Your queries will be corrected by your tutor and will be handed back to you in the subsequent week.
- You need to pass 6 out of 7 queries in order to be able to sit the exam (which will determine your grade).
- If you fail a query you will be given ONE more attempt. You will have to hand in your second attempt by **Friday at 5pm** the following week. If you fail that attempt again, that query will count as failed.
- Usually you will be asked to only **EXPLAIN** a certain view or argument. Normally you will be asked NOT to assess those. Here is how we will understand the two terms:
 - **Explain**: explain the view or argument in question
 - **Assess**: evaluate *from your own point of view* the arguments for and against a certain view or argument [Note: assessing views will be the main goal of the seminars; see below]

Required readings:

- Normally, you will have to read a *designated section of the book*. There will be a set of questions for each assigned section, which will help you think about the relevant issues.

- Normally, ALL students will have to read one of the presentation texts. You will be assigned the letter **A** or **B** in your first seminar. Accordingly, you will need to read either text A or B throughout this course
- You must prepare a *reflection* on the paper you are reading (either A or B). **Note:** the tutors may ask you to read out your reflection in front of the class
- A reflection is to be understood as a (briefly articulated) thought of yours on the views expressed in the article in question. For example: "I agree / disagree with the author because the author's argument X I do (not) find convincing for reason Y"
 - You must give reasons! It's not enough to state "I agree / disagree with the author because I do (not) find the author's argument X convincing" (without providing any reasons)
 - Try to look for something you *disagree* with; that will make it more interesting for all parties concerned

Presentations:

- Each student will have to team up with another student (if student numbers allow it) and present one of the *presentation texts* in the seminar;
- The presentation texts will be assigned in the first seminar. Presentations will start in WEEK 36. All presentation texts can be downloaded from BlackBoard;
- We do not want you to present an exhaustive summary of the text. Rather, we want you to focus on a few points in depth. For further instructions see the relevant document on BlackBoard.
- Your presentation should be about 15 min long.

Your grade

- There will be a multiple choice exam [date yet to be announced by the administration]. Your grade for this course will be determined through this exam only.

Required readings and presentation topics

Note of caution

- It is anticipated that you will find most of the readings challenging. Make sure to spend a good amount of time on reading and understanding the assigned texts.
- Since the formats of the texts differ, it is not a good idea to choose your presentations on the basis of number of pages. Instead, pick the topic which you think is most likely to get you interested.

Topic 1, WEEK 35: Demarcating evolution from creationism [S. Schindler]

What makes biology a science? Why is creationism not a science? We will discuss Popper's falsificationist demarcation criterion for a science and assess several creationist arguments against the theory of evolution.

Required reading:

- Ruse, M. "Creation-Science is Not Science", 38-47
- Laudan, L. "Commentary: Science at the Bar—causes of concern", 48-53
- Ruse, M. "Response to the Commentary: Pro Judice", 54-62 (OPTIONAL)

All of these texts are from the anthology by M. Curd and J. Cover (eds) (1998): *Philosophy of Science: the central issues*, WW. Norton. The page numbers refer to this anthology.

NOTE: additional to the readings, you need to do an exercise on arguments. See BlackBoard.

There are no student presentations for this week.

Background reading (optional):

- Sober, E. *Philosophy of Biology*, chpt 2.

Topic 2, WEEK 36: Dawkins' selfish genes [S. Schindler]

Evolution selects for genes rather than for individual organisms. This view has famously been defended by Richard Dawkins. We will discuss various arguments for and against this view.

Required reading:

- Dawkins, R., *The Selfish Gene*, pages 28-39 (or more), and
- SD, chapter 3 and 5.

Presentation texts:

- **A:** Gray, R. "Selfish genes or developmental systems?" in: , Singh et al. (eds.), 2001, *Thinking about Evolution*, pp. 184-208
- **B:** Lewontin, R. "The organism as subject and object of evolution", *Scientia*, 118 (1983), 65-82

Background reading (optional):

- Dawkins, R., *The Selfish Gene*, chapters 1-3 / SD, chapter 8

Topic 3, WEEK 37: Ethics of embryonic stem cell research [J. Busch]

What are the ethical concerns one might have about **embryonic stem cell research**? How strong are they, and what are the counterarguments?

Required reading:

- Lecture slides and Siegel, A., "Ethics of Stem Cell Research", *The Stanford Encyclopedia of Philosophy* (Spring 2013 Edition), Edward N. Zalta (ed.), forthcoming URL = <http://plato.stanford.edu/entries/stem-cells>

Presentation texts:

- **A:** Sagan, A. and P. Singer, "The moral status of stem cells", *Metaphilosophy*, vol. 38, no 2-3, 2007, pp. 264-84.
- **B:** Devolder, K. and J. Harris, "The ambiguity of the embryo: ethical inconsistency in the human embryonic stem cell debate", *Metaphilosophy*, 38, no. 2-3, 2007, pp. 154-169.

Topic 4, WEEK 38: Ethics of Extinction and Biodiversity [J. Busch]

Are species ethically relevant? Are there any moral grounds to avoid destruction of biodiversity? We will discuss what it means for species and biodiversity to be morally important to us and on what grounds.

Required reading:

- "Ethics and Biodiversity : Ethics and Climate Change in Asia and the Pacific (ECCAP) Project Working Group 16 Report", (p. 1 - 49 required reading, up until but not including section 4), available at: <http://unesdoc.unesco.org/images/0021/002182/218270E.pdf>

Presentation texts:

- **A:** Palmer, C., "Harm to Species - Species, Ethics, and Climate Change: The Case of the Polar Bear", *Notre Dame Journal of Law, Ethics & Public Policy*, Volume 23, Issue 2 Symposium on the Environment, February 2014, <http://scholarship.law.nd.edu/cgi/viewcontent.cgi?article=1107&context=ndjlepp>
- **B:** "What Is Conservation Biology?", Michael E. Soulé, *BioScience*, Vol. 35, No. 11, *The Biological Diversity Crisis*. (Dec., 1985), pp. 727-734. <http://links.jstor.org/sici?sici=0006-3568%28198512%2935%3A11%3C727%3AWICB%3E2.0.CO%3B2-F>

Optional reading

- "Causes, consequences and ethics of biodiversity", *Nature* 405, 208-211 (11 May 2000) <http://www.nature.com/nature/journal/v405/n6783/full/405208a0.html>

Topic 5, WEEK 39: Reductionism and determinism [J. Busch]

Does classical Mendelian genetics reduce to molecular biology? What exactly would a reduction amount to? What are the potential obstacles (if any) and how severe are they?

Required reading:

- SD, chapter 7

Presentation texts:

- **A:** Piotrowska, M. "What does it mean to be 75% Pumpkin? The units of comparative genomics", *Philosophy of Science*, vol.76(5), 2011, pp. 838-850.
- **B:** Perini, L. "Genomic Research and the Gene concept", *Philosophy of Science*, vol. 78(5), 2009, 752-62.

Background reading (optional):

- SD, chapter 6; Stanford Encyclopedia of Philosophy entries on "Reductionism in Biology" and "Compatibilism"

Topic 6, WEEK 40: Evolution in the social realm? [S. Schindler]

Can human social behavior and cognition be understood in evolutionary and genetic terms? What are the pitfalls of such an approach? What are the ethical concerns that have been raised? Ought there to be any limits on research, such as on the research into IQs and race and ethnicity? We will discuss two examples for the latter and the slippery slope towards eugenic policies.

Required reading:

- SD, chapter 13

Presentation texts:

- **A:** Three (short) texts:
 - Nature commentary: "Should scientists study race?", Vol 457 | 12 February 2009, Ceci and Williams: YES: The scientific truth must be pursued. AND Rose: NO: Science and society do not benefit.
 - Lewontin, R. "Race and intelligence", 1970, *Bulletin of the Atomic Scientists* **26** (3): 2–8.
- **B:** Andreasen, Robin, "Race: Biological Reality or Social Construct?", *Philosophy of Science*, Vol. 67, Supplement. Proceedings of the 1998 Biennial Meetings of the Philosophy of Science Association. Part II: Symposia Papers (Sep., 2000), pp. S653-S666

Topic 7, WEEK 41: The species problem [S. Schindler]

Conventionalists like Darwin believe that what it is for something to be a species is *only* a matter of what we agree to call a species—there is no matter of the fact what a species *really* is. Realists, on the other hand, believe that there is such a matter of fact. One realist view we'll look into in particular is the species-as-individuals view, which has it that species are not classes but individuals.

Required reading:

- SD, chapter 9

Presentation texts:

- **A:** Barker, M. "The empirical inadequacy of species cohesion by gene flow", *Philosophy of Science*, vol. 74(5): pp. 654-665 (2007)
- **B:** Pigliucci, M. "Species as family resemblance concepts: the (dis-)solution of the species problem?", *BioEssays*, 25(6), 2003, pp. 596-602.