

Course:

Contemporary issues in the philosophy of biology

Abstract:

The course presents conceptual issues in major biological fields, such as evolution, genetics, epigenetics, the notion of what is life, epistemology, ecology, and biological race concepts. It highlights major actual controversies related to biology, for example around evolutionary theory, epigenetics, life concepts, and concepts of race, and it discusses issues of methodology and epistemology, such as those related to the use of statistics, and the distinction between causality and correlation in big data biology.

Lecturers: Yonatan Chemla, Ute Deichmann, Noa-Sophie Kohler, Michael Shaferman, Ofer Ovadia

The course will be mostly held in English.

Requirements:

Class attendance is mandatory.

Assessments:

- Contribution to discussions in class
- Preparation of posters (max. 2 people per poster) on assigned topics related to philosophers and scientists in the 20th and 21st centuries. Students will be examined about the contents of the posters and related topics from the course. The posters will be exhibited in the department of Philosophy.

Topics:

1. What is biology?

Conceptual changes of evolutionary theory (i)

The emergence of organic evolution as a scientific enterprise; Lamarck, Darwin, and their philosophies

2. Conceptual changes of evolutionary theory (ii)

Darwin's and Mendel's concepts of heredity, neo-Darwinism and its critics

3. The changing concept of the gene - genetics, molecular biology, genomics, and post-genomics

4. Is the notion of scientific revolution (Kuhn) useful in biology? The example of molecular genetics and epigenetics

5. What is life? Philosophical and biological perspectives, Part 1
6. What is life? Philosophical and biological perspectives, Part 2
7. Plasticity and variation, stability and invariance in organismic development and evolution
8. Bacon, Popper, and Polanyi - the philosophies of modern experimental biology and the impact of big data technologies
9. The use and abuse of statistics in the life sciences
10. Early controversies about bacteria, viruses, and vaccines; technology of vaccinations under special consideration of the Covid 19 vaccines
11. Past critiques of ecology and contemporary approaches
12. Philosophical and scientific origins of racism
13. Genomic databases: controversies about the inference of ancestry and racial/ethnic group attribution
14. CrispR cas9 - the non-linear discovery of a powerful genome editing tool and its far reaching applications

Keywords: Evolution, genetics, epigenetics, genomics, ecology, plasticity and constancy, life, biology and race