

Philosophy of science, 2 ECTS

Schedule Autumn 2020

Monday, 12 October, 09.15-12.00, HE109 Humanisthuset, PM

Lecture 1: Scientific method

the distinction between formal and empirical sciences, scientific method in formal sciences: the traditional view on proof in mathematics and an alternative view, scientific method in empirical sciences: hypothetico-deductive method, statistical hypothesis testing, and inference to the best explanation

Readings:

Darwin, C. (1876). *The Variation of Animals and Plants under Domestication*. New York: Appleton and Co., pp. 9-14.

Duhem, P. (1914/1954). *The Aim and Structure of Physical Theory*. Princeton, New Jersey: Princeton University Press, pp. 183-188.

Gödel, K. (1947). "Platonism and Intuition". Excerpt from "What is Cantor's Continuum Problem?" *The American Mathematical Monthly*, 54, pp. 515-25.

Hand, D. J. (2008). *Statistics: A Very Short Introduction*. Oxford: Oxford University Press, pp. 85-89.

Huygens, C. (1690). *Treatise on Light*. (Excerpt from the preface.)

Okasha, S. (2002). *Philosophy of Science: A Very Short Introduction*. Oxford: Oxford University Press, pp. 18-33.

Monday, 12 October, 13.15-15.00, HE109 Humanisthuset, PM

Lecture 2: Karl Popper's falsificationism

the problem of induction and Karl Popper's solution, falsifiability as a criterion of demarcation between science and non-science, objections to Popper's views

Reading:

Brown, J. R. (2001). *Who Rules in Science?* Cambridge, Mass.: Harvard University Press, pp. 49-74.

Tuesday, 13 October, 13.15-16.00 HE109 Humanisthuset, PM

Lecture 3: Thomas Kuhn and paradigms

Thomas Kuhn's theory of the development of sciences, paradigms, anomalies and scientific revolutions, Kuhn's thesis of incommensurability, puzzle-solving capability as a criterion of demarcation between science and non-science, developments after Kuhn

Reading:

Brown, J. R. (2001). *Who Rules in Science?* Cambridge, Mass.: Harvard University Press, pp. 49-74.

Wednesday, 14 October, 13.15-15.00, HE109 Humanisthuset, PM

Seminar 1: Scientific method – a case study

A scientific research article will be discussed with regard to what hypotheses and evidence are presented, what methods are used, which background assumptions are made, what paradigms are used, what results are achieved, etc.

Reading:

Alvarez, Luis et al. (1980). "Extraterrestrial Cause for the Cretaceous-Tertiary Extinction". *Science*, 208, 1095-1108.

Thursday, 15 October, 10.15-12.00, HE109 Humanisthuset, IBT

Lecture 4: Some personal experiences of philosophical problems in science, e.g. the metaphysics of membrane potential, and the concept of health.

Optional readings (not obligatory):

Täljedal, I.-B. (1981). "On the metaphysics of membrane potential in islet cells: studies with triphenylmethylphosphonium". *Uppsala J Med Sci* 86: 171-176.

Täljedal, I.-B. (2004). "Strong holism, weak holism, and health". *Medicine, Health Care and Philosophy* 7: 143–148.

Monday, 19 October, 08.15-12.00, HE109 Humanisthuset, PM

Seminar 2: Science and gender

The role of gender in science will be discussed. Each student is expected to reflect on the role of gender in his or her field or research project and give a short presentation to the seminar and hand in a written summary as a part of the examination of the course. (For detailed instructions, see the document "Instructions for seminar 2" on the course's Cambro site.)

Seminar 2 is part of the examination of the course; students who do not attend actively must submit a make-up assignment (restuppgift).

The exam for the course, which must be uploaded on Cambro no later than Sunday 25 October, will be handed out after the seminar.

Reading:

Kourany, J. (2012). Feminist critiques: Harding and Longino. In James Robert Brown (ed): *Philosophy of Science: Key Thinkers*. London: Continuum, 236-254.

All the readings will be available as pdf:s on the course's Cambro site.

Instructors

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