Course: Epistemology and Philosophy of Science
Master & PhD Degrees in Philosophy
7,5 / 12 ECTS
2024-2025 - 1st Semester
Instructors: Adriana Silva Graça, Andrea Oldofredi and Robert Michels
Language of instruction: English

Syllabus & References

Module 1: What is Knowledge? [Adriana Silva Graça]
In this module, the analysis of Knowledge will be dealt with. Topics such as the traditional analysis will be discussed as well as the standard responses and objections --known as internalist and externalist ones—to it. Finally, philosophical approaches as the virtue epistemology and "knowledge first" will be taken into consideration.

A. J. Ayer (1956): "Knowing as Having the Right to be Sure" in *The Problem of Knowledge*, London: Macmillan.

E. Gettier (1963) "Is Justified True Belief Knowledge?" in *Analysis*, Vol. 23, pp. 121-123.

Plato, *Theaetetus*.

R. Audi (2011), *Epistemology. A Contemporary Introduction to the Theory of Knowledge*. Routledge.

D. Pritchard (2018), *What Is This Thing Called Knowledge?* Routledge.

Module 2: Scientific Theories and Explanations: What Are They?

In this module we will focus on three classic issues in the philosophy of science. In the first place we will analyze the question about distinguishing science from pseudo-science. Given the popularity that anti-scientific claims unfortunately currently have - as e.g. the proliferation of a variety of fake news and conspiracy theories questioning the validity of contemporary science - such a topic has still a central relevance in today's philosophical discussions. In the second place, we will introduce the most common views about what scientific theories are: the syntactic, semantic and pragmatic perspectives. Finally, we will study the nature of scientific explanations. Starting from Hempel's nomological-deductive model to present-day discussions concerning mathematical explanations and idealizations in science. We will also study how different sciences will provide diverse accounts of scientific explanations.

References:

Selected essays from Curd, M, Cover, J. A. and Pincock, C. (eds.), *Philosophy of Science. The Central Issues.* WW Norton & Co. Second Edition, 2012.

Selected Chapters from Salmon, Wesley C., *Four Decades of Scientific Explanations*, University of Pittsburgh Press, 2006.

Selected Chapters from Van Fraassen, Bas, *The Scientific Image*, Oxford University Press, 1980.

Module 3: Epistemic Opacity in Machine Learning Models

Machine learning models have proven to be an important tool in sciences such as for example medicine, meteorology, or physics. They can even exceed traditional models in predictive power, or identify certain phenomena with higher accuracy than human experts, but they also give rise to new philosophical questions. In this module, we will focus on a central epistemological problem with machine learning models based on deep neural networks, the problem of epistemic opacity. Very roughly put, this is the problem that completely understanding how such models work is beyond the epistemic grasp of any human scientist.

References:

Humphreys, Paul (2009). The philosophical novelty of computer simulation methods. Synthese 169 (3):615 - 626.

Beisbart, Claus & Räz, Tim (2022). Philosophy of science at sea: Clarifying the interpretability of machine learning. Philosophy Compass 17 (6).

Grading & Assessment

Students are expected to write a final essay (around 4000 words) in one of the modules (40% of the final grade) and to make one written test (in class) for each module (60% of the final grade). Depending on the instructors' choice and on the number of students in class, oral presentations may be included.