UNIVERSITY COLLEGE FREIBURG

Philosophy of Science

Course syllabus

Summer Semester 2019

LAS: Module – "Perspectives on Science" (6 ECTS)

Philosophy: "Vorlesung" in Theoretische Philosophie (3 ECTS). 'Studienleistung' only.

Times and rooms:

Lecture:	Wed 12:15-14:00h, KG 3042	
Workgroups:	WG 1:	Thu 16-18h, KG 1231
	WG 2:	Thu 16-18h, KG 1139
	WG 3:	Thu 18-20h, KG 1023
	WG 4:	Thu 18-20h, KG 1036

Instructor: PD Dr. Tobias Henschen

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Course website: ILIAS (password: Popper).

The website will feature important course material like scans of assigned readings, exercise sheets and lecture slides. Make sure that you join the course, and that you adjust your settings so as to be able to receive notifications and messages. Emails will be sent via the ILIAS messaging system.

Overview and goals

The course is part of the systematic reflections on knowledge and science within the LAS-core. It uses logic and argument to analyze questions about induction, and causality, of whether we should be realists or antirealists about the existence of the non-observable entities (leptons, genes, market forces and so on) that many scientific disciplines posit, and about the role that non-scientific values (ideologies, value judgments, material interests and so on) are likely to play in the sciences.

Learning goals:

- to understand that the philosophical foundations of science are shaky and require a lot of hard thinking,
- to be able to read and understand (difficult) texts about topics in philosophy of science, i.e. to identify essential positions and lines of reasoning quickly and effectively,
- to compose pieces of written work that analyze philosophical ideas or problems in a concise and thorough way,
- to be able to debate problems that are intellectually challenging in a fair and detached manner, and to present the results of such debates in an adequate way.

Requirements

To complete the **pass/fail** requirements (*Studienleistung*) you need to attend work group meetings and actively participate in the discussion. You may miss up to 2 workgroup meetings without explanation and without being sanctioned. It will be your responsibility to make up work for the missed meetings. Absences from more than 2 meetings will require compensatory work (e.g. a short essay). In this case, please contact your tutor. Otherwise you risk failure of the course or other sanctions. Attending the lecture is strongly desirable but not strictly mandatory.

The **examination** (*Prüfungsleistung*) consists of 5 exercise sheets and one written exam on July 24.

Exercise sheets (20% of the final grade): The exercise sheets are written assignments that help you improve your reading ability. They refer to central passages of the mandatory and additional readings that will be discussed in the lectures. Solutions to the exercises will be discussed in the work groups. Work group discussions are also meant to continue and intensify discussions initiated in the lectures. Exercise sheets will be made available via ILIAS no later than three days before the lecture and need to be submitted via ILIAS (no later than immediately) before the lecture. There will be a total of 10 exercise sheets of which you will need to pass at least 5 (i.e. of which you will need to submit at least 5 that will be graded 4.0 or better). If you have passed 5 exercise sheets, their combination will be graded by 1.0. Failed exercise sheets cannot be revised.

Written exam (80% of the final grade): The written exam, which will take place on July 24, will cover the material of the whole semester. It will very much resemble the exercise sheets but also cover the contents of the lectures.

The re-sit will take place in October. It will be more difficult than the (regular) written exam and cover the material of the whole semester. You will have to do the resit if you fail the written exam or pass less than five exercise sheets.

Important formalia

The completion of the *Studienleistung* is the prerequisite for the admission to the *Prüfungsleistung*.

Cell phones and social media must not be used during lectures or work group meetings. It will be absolutely necessary that you remain quiet during lectures and work group meetings. Otherwise you and your fellow students won't be able to follow. If you have questions raise your hand.

You are welcome to send me an email if you have questions or want to make suggestions. If your email is of interest to all course participants, I will respond to them in the lecture.

The UCF policy on plagiarism and cheating applies to the exercise sheets and final exams. Failing to indicate sources and correctly reference all ideas and quotes from other authors or your work in other assignments will result in failing the course component and possibly the course as a whole. Cases of suspected plagiarism will be reported to the Examination Board.

SCHEDULE (PRELIMINARY)

General topic	Date	Format	Specific topic	Mandatory readings*	Additional readings*
Intro	Wed 4/25	L	Topics, goals, requirements, formalia, "philosophy"		
Confirmation	Wed 5/8	L	**Problem of induction and logic of falsification**	Popper (1936)	
	Thu 5/9	WG 1-4	Exercise sheet 1		
	Wed 5/15	L	**Logic of confirmation and new riddle of induction**	Hempel (1945)	Goodman (1983)
	Thu 5/16	WG 1-4	Exercise sheet 2		
	Wed 5/22	L	**Bayesianism**	Lambert and Brittan (1991)	Norton (2011)
	Thu 5/23	WG 1-4	Exercise sheet 3		
Causality	Wed 5/29	L	**Regularities and probabilities**	Suppes (1970)	Mackie (1974)
	Thu 5/30	WG 1-4	Holiday		
	Wed 6/5	L	**Counterfactuals I**	Lewis (1973)	Lewis (1979)
	Thu 6/6	WG 1-4	Exercise sheets 4+5		
	Wed 6/19	L	**Counterfactuals II**	Lewis (1973)	Lewis (1979)
	Thu 6/20	WG 1-4	Holiday		
	Wed 6/26	L	**Interventions**	Woodward (2003: 2.2-3)	Woodward (2003: 3.1.1-5, 3.5)
	Thu 6/27	WG 1-4	Exercise sheets 5+6		
Realism	Wed 7/3	L	**Structural and entity realism**	Hacking (1982)	Chakravartty (2016: chap. 5)
	Thu 7/4	WG 1-4	Exercise sheet 7		
	Wed 7/10	L	**Antirealism**	Laudan (1981)	Van Fraassen (2001)
	Thu 7/11	WG 1-4	Exercise sheet 8		
Values	Wed 7/17	L	**Inductive risk**	Rudner (1953), Douglas (2000)	Jeffrey (1956), Levi (1962)
	Thu 7/18	WG 1-4	Exercise sheets 9+10		
	Wed 7/24	*Written exam*			

* Cf. exercise sheets for more specific statements of page numbers or sections.

Bibliography

I Mandatory and additional readings

Fraassen, B. van (2001). "Constructive Empiricism Now." *Philosophical Studies*, 106: 151–170.

Godfrey-Smith, P. (2003). *Theory and Reality*. Chicago: University of Chicago Press.

Goodman (1983). "The new riddle of induction." In: *Fact, Fiction, and Forecast*. Cambridge, MA: HUP.

Hacking, I. (1982). "Experimentation and Scientific Realism." *Philosophical Topics* 13: 71-87.

Hempel, C. G. (1945). "Studies in the logic of confirmation I+II", *Mind* 54 (213+214): 1-26, 97-121.

Jeffrey, R. (1956). "Valuation and Acceptance of Scientific Hypotheses." *Philosophy of Science* 23(3): 237-246.

Ladyman, J. & D. Ross (2007). *Every Thing Must Go*. Oxford: OUP.

Lambert, K. & G.G. Brittan (1987). *Introduction to Philosophy of Science*. Atascadero, CA: Ridgeview.

Laudan, L. (1981). "A Confutation of Convergent Realism." *Philosophy of Science* 48: 19-48.

Levi, I. (1962). "On the Seriousness of Mistakes." *Philosophy of Science* 29: 47-65.

Lewis, D. (1973). "Causation". *Journal of Philosophy* 70: 556-567.

Lewis, D. (1979). "Counterfactual Dependence and Time's Arrow." *Nous* 13: 455-47.

Longino, H. (1996). "Cognitive and Non-cognitive Values in Science." In: L. Nelson and J. Nelson (eds.), *Feminism, Science, and the Philosophy of Science*. London: Kluwer, 39-58.

Mackie, J. (1974). *The Cement of the Universe: A Study of Causation*. Oxford: Clarendon.

Norton, J. (2008). "Must Evidence Underdetermine Theory?" In: M. Carrier et al. (eds.), *The Challenge of the Social and Pressure of Practice: Science and Values Revisited*. Pittsburgh: University of Pittsburgh Press, 17-44.

Norton, J. (2011). "Challenges to Bayesian Confirmation Theory." In: P. S. Bandyopadhyay and M. R. Forster (eds.), *Handbook of the Philosophy of Science. Vol. 7: Philosophy of Statistics*. Amsterdam: Elsevier.

Rudner, R. (1953). "The Scientists qua Scientists Makes Value Judgments." *Philosophy of Science* 20: 1-6.

Suppes, P. (1970). *A Probabilistic Theory of Causality*. Amsterdam: North-Holland.

Woodward, J. (2003). *Making Things Happen: A Theory of Causal Explanation*. Oxford: OUP.

II Introductions to philosophy of science

Carnap, R. (1995). *Introduction to the Philosophy of Science*. Dover Publications.

Godfrey-Smith, P. (2003). *Theory and Reality. An Introduction to the Philosophy of Science*. Chicago: University of Chicago Press.

Lambert, K. & G.G. Brittan (1987). *Introduction to Philosophy of Science*. Atascadero, CA: Ridgeview.
Psillos, S. (2002). *Causation and Explanation*. Acumen.
Rosenberg, A. (2000). *Philosophy of Science. A Contemporary Introduction*. London: Routledge.
Schurz, G. (2014). *Philosophy of Science. A Unified Approach*. London: Routledge.

III. Important work on philosophy of science

Feyerabend, P. (2010). *Against Method*. Verso.
Fraassen, B. C. van (1980). *The Scientific Image*. Oxford: OUP.
Hempel, C. G. (1965). *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science*. New York: Free Press.
Kitcher, P. (1993). *The Advancement of Science*. Oxford: OUP.
Kuhn, T. S. (1962). *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press
Nagel, E. (1961). *The Structure of Science*. New York: Harcourt.
Popper, K. R. (1936/2002). *Logic of Scientific Discovery*. London: Routledge.
Putnam, H. (1975). *Mathematics, Matter, and Method, Philosophical Papers, Vol.* 1, Cambridge: CUP.
Putnam, H. (1975). *Mind, Language, and Reality. Philosophical Papers, Vol.* 2, Cambridge: CUP.