Course Code: PHIL 4183

Course Title: Philosophy of Science (科學哲學)

2011-12 Term 1

Instructor: Cheung, Kam Ching Leo (張錦青) (email: leokccheung@cuhk.edu.hk)

Tutor: Yeung, Chun Yin Salt (楊俊賢) (email: salt.yeung@gmail.com)

Time / Venue : Thursday 14:30-17:15 / LHC G06

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Course Description:

This course is an elementary, and yet comprehensive, introduction to Philosophy of Science. Philosophy of Science is the branch of philosophy, which aims to study and investigate the nature and methodology of natural science in general. Although, strictly speaking, Philosophy of Science is different from the philosophy of a particular science like, for example, Philosophy of Physics, this course also attempts to provide philosophical reflections on certain basic concepts employed in physical science. The issues to be discussed in this course include theory and observation, natural laws, scientific explanation and prediction, induction, the demarcation between science and non-science, scientific change, realism and antirealism, causation and science, and space and time.

Assessment:

Tutorial presentation and participation	(25%)
Term Paper*	(35%)
Final Examination	(40%)

*. In your term paper, if there are any ideas, opinions and/or materials which are taken from others, no matter whether you quote them word by word or not, you MUST provide the sources. Otherwise, you would be considered as having committed Plagiarism. (Please also refer to http://www.cuhk.edu.hk/policy/academichonesty/ for 'Honesty in Academic Work'.)

*. Students are required to submit their term papers to the **VeriGuide** system before handing them in. Please visit http://veriguide1.cse.cuhk.edu.hk/portal/page/index.jsp for the VeriGuide system.

Outline Content:

1. Introduction—What is Philosophy of Science?

2. Scientific Explanation

3. Laws of Nature

4. The Problem of Induction

5. The Nature of Science
   5.1 Inductivism

5.2 Popper's Falsificationism
5.3 The Quine-Duhem Thesis
5.4 Scientific Revolution: Kuhn's Philosophy of Science
5.5 Lakatos' Research Programmes
5.6 Feyerabend's Theory of Anarchistic Knowledge

6. Realism and Antirealism

7.* Probability and Science
7.1 Subjective Probability and Objective Probability
7.2 Bayesianism

8. Space and Time in Science
8.1 Concepts and Scientific Theories
8.2 Measurement of Time and Length
8.3 Geometry and Space
8.4 The Geometricalization of the Universe: The Special and General Theories of Relativity

*. This chapter may not be taught.

References (selected):

*Bird, Alexander, *Philosophy of Science*. London: UCL 1998.

*Bortolotti, L. *An Introduction to the Philosophy of Science*. Cambridge: Polity 2008.

Campbell, N. *What is Science?* NY: Dover 1953.

Carnap, R. *An Introduction to the Philosophy of Science*. NY: Dover 1995.

*Chalmers, A. F. *What is this Thing Called Science?* 3rd edition. Indianapolis: Hackett 1999.

*Curd, M. and Cover, J. A. (eds.) *Philosophy of Science*. NY: Norton 1998.

Feyerabend, P. *Against Method.* London: verso 1987.

*Hempel, C. G. *Philosophy of Natural Science*. New Jersey: Prentice Hall 1966.

*————. *Aspects of Scientific Explanation*. NY: Free Press 1970.

*Kuhn, T. S. *The Structure of Scientific Revolutions.* Chicago: U. of Chicago Press 1996.

Lakatos, I. *The Methodology of Scientific Research Programmes*. J. Worrall and G. Currie (eds.). Cambridge: Cambridge U. Press 1978.

Lakatos, I and P. Feyerabend. *For and Against Method*. M. Motterlini (eds). Chicago: U. of Chicago Press 1999.

Nagel, E. *The Structure of Science*. NY: Harcourt 1961.

Newton-Smith, W. H. (ed.) *A Companion to the Philosophy of Science.* Oxford: Blackwell 2001.

Popper, K. R. *The Logic of Scientific Discovery.* London: Hutchinson 1980.

*————. *Conjectures and Refutations.* London: RKP 1989.

Quine, W. V. *From a Logical Point of View.* Cambridge: Harvard U. Press 1980.

Rosenberg, A. *Philosophy of Science: A Contemporary Introduction.* London: Routledge 2005.

Salmon, W. *Scientific Explanation and the Causal Structure of the World*. Princeton: Princeton U. Press 1984.

*. I have tried to reserve these books at the Library (with 2 hours loan period).

Teaching Schedule (Provisional):

	Date	Topic	
Week 1	08-09-2011	1. 2.	Introduction—What is Philosophy of Science? Scientific Explanation
Week 2	15-09-2011	2.	Scientific Explanation
Week 3	22-09-2011	3.	Laws of Nature
Week 4	29-09-2011	4.	The Problem of Induction
Week 5	06-10-2011	5.1 5.2	Inductivism Popper's Falsificationism
Week 6	13-10-2011	5.2 5.3	Popper's Falsificationism The Quine-Duhem Thesis
Week 7	20-10-2011	5.4	Scientific Revolution: Kuhn's Philosophy of Science
Week 8	27-10-2011	5.4 5.5	Scientific Revolution: Kuhn's Philosophy of Science Lakatos's Research Programmes
Week 9	03-11-2011	5.5 5.6	Lakatos's Research Programmes Feyerabend's Theory of Anarchistic Knowledge mmes
Week 10	10-11-2011	6.	Realism and Antirealism
Week 11	17-11-2011	6. 7.*	Realism and Antirealism Probability and Science
Week 12	24-11-2011	7.* 8.	Probability and Science Space and Time in Scien
Week 13	01-12-2011	8.	Space and Time in Science