HPSC 1003. PHILOSOPHY OF SCIENCE

Department of Science and Technology Studies, UCL
Term 2, 2011-2012

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Lectures: Mondays 12-1pm
Thursdays 12-1 pm
Tutorials: Mondays, 1-2pm or Thursdays 1-2 pm
(**note: tutorials start on the second week of term**)

For venues of the lectures and tutorials please refer to the common timetable.

The philosophy of science addresses fundamental questions such as:

- What is science? How does it differ from other systems of belief and knowledge?
- Does scientific knowledge necessarily progress?
- What are the methods by which scientific ideas are generated and validated?

These questions may seem trivial, but you will find that deeper reflection reveals huge challenges in giving satisfactory answers to them. The main objective of this course is to cultivate your ability to think through these difficult issues -- clearly, systematically, and critically.

Assessment

Assessment is by a written examination (50%), and two essays (25% each). More details about the essays will be given in separate handouts. Please consult the departmental Notes for Guidance on late penalties and other departmental rules regarding essay assignments. The exam is at the end of the academic year. (For affiliate students who are here only for the first term, the exam will be replaced by an additional essay). There will be revision sessions for the exam during the second or third term, and past exam papers can be looked up via the library website. **Please note that you must complete all assessed elements in order to complete this course unit**, and that those who do not complete the course will not receive any overall marks for it. For assessment generally you will need to master the content of the lectures, the required readings, and any other specified readings for essays.

Location of Reading Materials

The textbook for this course, in which you can find all of the required readings and some of the recommended further readings, is Martin Curd and J. A. Cover, eds., Philosophy of Science: The Central Issues (New York and London: W. W. Norton & Company, 1998). This is an anthology of classic readings, with some helpful introductions, notes and commentary by the editors. Also highly recommended is the introductory textbook by A. F. Chalmers, What Is This Thing Called Science?, 3rd ed. (Buckingham: Open University Press, 1999); the second edition may also be used, although the third edition is preferable. These books are available for purchase at Waterstone's, and there are also several copies of each in the UCL Libraries. (In the schedule of readings below, these sources will be indicated simply as “Curd and Cover” and “Chalmers”.)

All necessary readings not found in the Curd and Cover textbook will be available in the UCL Science Library, with some copies in the Short Loan Collection there. Please note that some sources relevant to this course are located in the UCL Main Library, though most can be found in the Science Library. Be sure to ascertain the exact locations, loan status, and availability in the catalogue before looking for materials on the shelves.

SCHEDULE OF ASSESSMENT

Essay 1 due on Wednesday 8 February 2012
Essay 2 due on Monday 19 March 2012
(further details about the essays will be given during the lectures)

SCHEDULE OF LECTURES AND READINGS

PART I. WHAT IS SCIENCE?

Unit 1. Inductivism (week of 9 January 2012)
• Karl Popper, "The Problem of Induction", in Curd and Cover, pp. 426-428.
Also recommended:
• Chalmers, pp. xix-xxii, 1-18 (Introduction, Ch. 1); in the second edition, see pp. xv-xiv, 1-21.
• Anthony O'Hear, An Introduction to the Philosophy of Science (Oxford: Clarendon Press, 1989), pp. 12-34 (Ch. 2).

Unit 2. Falsificationism (week of 16 January 2012)
• Karl Popper, "Conjectures and Refutations", in Curd and Cover, pp. 3-10.
• Karl Popper, "The Problem of Induction", in Curd and Cover, pp. 429-432.
Also recommended:
• Karl Popper, Conjectures and Refutations, 3rd ed. (London: Routledge, 1969), pp. 39-59 (Sec. 1.IV-1.X). This is the continuation of the first selection above.
• Chalmers, pp. 59-73 (Ch. 5); in the second edition, see pp. 38-49.
• Anthony O'Hear, An Introduction to the Philosophy of Science (Oxford: Clarendon Press, 1989), pp. 54-81 (Ch. 4).
• Karl Popper, "Replies to My Critics", in Paul Arthur Schilpp, ed., The Philosophy of Karl Popper, Vol. 2 (La Salle: Open Court, 1974), pp. 976-987.

Unit 3. Normal Science (week of 23 January 2012)
• Thomas S. Kuhn, "Logic of Discovery or Psychology of Research?", in Curd and Cover, pp. 11-19.
Also recommended:
• Thomas S. Kuhn, The Structure of Scientific Revolutions, 2nd ed. (Chicago: University of Chicago Press, 1970), pp. 10-51 (Sec. 2-5).
• Chalmers, pp. 104-112 (first part of Ch. 8); in the second edition, see pp. 89-93.
• John Watkins, "Against Normal Science", in Imre Lakatos and Alan Musgrave, eds., Criticism and the Growth of Knowledge (Cambridge: Cambridge University Press, 1970), pp. 25-37.
• Karl Popper, "Normal Science and Its Dangers", in Imre Lakatos and Alan Musgrave, eds., Criticism and the Growth of Knowledge (Cambridge: Cambridge University Press, 1970), pp. 51-58.

Unit 4. Progress, Rationality and Science (week of 30 January 2012)
• Imre Lakatos, "Science and Pseudoscience", in Curd and Cover, pp. 20-26.
• Paul R. Thagard, "Why Astrology is a Pseudoscience", in Curd and Cover, pp. 27-37.
Also recommended:
• Chalmers, pp. 130-148 (Ch. 9); in the second edition, see pp. 77-88.
• Brendan Larvor, Lakatos: An Introduction (London and New York: Routledge, 1998), pp. 47-72 (Ch. 4).
• Imre Lakatos, "Criticism and the Methodology of Scientific Research Programmes", Proceedings of the Aristotelian Society, Vol. 69 (1968), pp. 167-186 (Sec. 3,4).
• Paul Feyerabend, "How to Defend Society Against Science", Radical Philosophy, No. 11 (1975), pp. 3-8; reprinted in E. D. Klemke, Robert Hollinger, and A. David Kline, eds.,

Introductory Readings in the Philosophy of Science, revised ed. (Buffalo: Prometheus Books, 1988), pp. 34-44.

Unit 5. The Case of Creation-Science (week of 6 February 2012)
• Michael Ruse, "Creation-Science Is Not Science", in Curd and Cover, pp. 38-47.
• Larry Laudan, "Commentary: Science at the Bar -- Causes for Concern", in Curd and Cover, pp. 48-53.
• Michael Ruse, "Response to the Commentary: Pro Judice", in Curd and Cover, pp. 54-61.

*NO LECTURES DURING READING WEEK (week of 13 February 2012)

PART II. SCIENTIFIC CHANGE AND THEORY-CHOICE

Unit 6. Falsification and Theory-Choice (week of 20 February 2010)
• Wesley C. Salmon, "Rational Prediction", in Curd and Cover, pp. 433-444.
Also recommended:
• Chalmers, pp. 74-103 (Ch. 6, 7); in the second edition, see pp. 50-76.
• Karl Popper, The Logic of Scientific Discovery, rev. ed. (London: Hutchinson, 1959), pp. 251-281 (Ch. 10).
• Hilary Putnam, "The 'Corroboration' of Theories", in Paul Arthur Schilpp, ed., The Philosophy of Karl Popper (La Salle: Open Court, 1974), Vol. 1, pp. 221-240; see also Popper's reply to Putnam in the same collection, Vol. 2, pp. 993-999.
• Anthony O'Hear, Karl Popper (London: Routledge and Kegan Paul, 1980).

Unit 7. Criteria of Confirmation (week of 27 February 2012)
• Carl G. Hempel, "Criteria of Confirmation and Acceptability", in Curd and Cover, pp. 445-459.
Also recommended:
• Carl G. Hempel, Philosophy of Natural Science (Englewood Cliffs: Prentice-Hall, 1966), pp. 3-32 (Ch. 2, 3).
• Chalmers, pp. 41-58 (Ch. 4).
• Paul Horwich, Probability and Evidence (Cambridge: Cambridge University Press, 1982), pp. 1-15 (Ch. 1).
• Laura J. Snyder, "Is Evidence Historical?", in Curd and Cover, pp. 460-480.
• Alan Musgrave, "Logical versus Historical Theories of Confirmation", British Journal for the Philosophy of Science, Vol. 25 (1974), pp.1-23.

Unit 8. Scientific Revolutions (week of 5 March 2012)
• Thomas S. Kuhn, "The Nature and Necessity of Scientific Revolutions", in Curd and Cover, pp. 86-101.
• Thomas S. Kuhn, "Objectivity, Value Judgment, and Theory Choice", in Curd and Cover, pp. 102-118.
Also recommended:
• Chalmers, pp. 112-129 (latter parts of Ch. 8); in the second edition see pp. 94-100.
• Thomas S. Kuhn, The Structure of Scientific Revolutions, 2nd ed. (Chicago: University of Chicago Press, 1970), pp. 52-91, 111-135 (Sec. 6-8, 10).
• George Couvalis, The Philosophy of Science: Science and Objectivity (London: Sage Publications, 1977), pp. 87-110 (Ch. 4).

Unit 9. Rationality in Paradigm Change (week of 12 March 2012)
• Ernan McMullin, "Rationality and Paradigm Change in Science", in Curd and Cover, pp. 119-138.

Also recommended:
• Thomas S. Kuhn, The Structure of Scientific Revolutions, 2nd ed. (Chicago: University of Chicago Press, 1970), pp. 160-173 (Sec. 13), 198-201 (latter part of the Postscript).
• Larry Laudan, "Dissecting the Holist Picture of Scientific Change", in Curd and Cover, pp. 139-169.
• Karl R. Popper, "The Rationality of Scientific Revolutions", in Ian Hacking, ed., Scientific Revolutions (Oxford: Oxford University Press, 1981), pp. 80-106; also in Rom Harré, ed., Problems of Scientific Revolution (Oxford: Clarendon Press, 1975), pp. 72-101.

Unit 10. Underdetermination (week of 19 March 2012)
• Peter Lipton, "Induction", in Curd and Cover, pp. 412-425.
• Donald Gillies, "The Duhem Thesis and the Quine Thesis", in Curd and Cover, pp. 302-319.
Also recommended:
• Pierre Duhem, "Physical Theory and Experiment", in Curd and Cover, pp. 302-319.
• Anthony O'Hear, An Introduction to the Philosophy of Science (Oxford: Clarendon Press, 1989), pp. 82-105 (Ch. 5).

Sources for General Reference

Introductory textbooks
• A. F. Chalmers, What is this thing called science?, 3rd ed. (Buckingham: Open University Press, 1999).
• Nicholas Everitt and Alec Fisher, Modern Epistemology: A New Introduction (New York: McGraw-Hill, 1995).
• Rom Harré, The Philosophies of Science (Oxford: Oxford University Press, 1972).
• Carl G. Hempel, Philosophy of Natural Science (Englewood Cliffs: Prentice-Hall, 1966).
• Peter Kosso, Reading the Book of Nature (Cambridge: Cambridge University Press, 1992).
• Peter Godfrey-Smith, Theory and Reality (Chicago and London: The University of Chicago Press, 2003).
• Anthony O'Hear, An Introduction to the Philosophy of Science (Oxford: Clarendon Press, 1989).
• Samir Okasha Philosophy of Science: A Very Short Introduction (Oxford: Oxford University Press, 2002).

Intermediate-level texts
• George Couvalis, The Philosophy of Science: Science and Objectivity (London: Sage Publications, 1977).
• Donald Gillies, Philosophy of Science in the Twentieth Century (Oxford: Blackwell, 1993).
• Ian Hacking, Representing and Intervening (Cambridge: Cambridge University Press, 1983).
• Alan Musgrave, Common Sense, Science and Scepticism: A Historical Introduction to the Theory of Knowledge (Cambridge: Cambridge University Press, 1993).
• W. H. Newton-Smith, The Rationality of Science (London and New York: Routledge, 1981).

Anthologies
• Richard Boyd, Philip Gasper, and J. D. Trout, eds., The Philosophy of Science (Cambridge, Mass.: The MIT Press, 1991).
• Ted Honderich, ed. The Oxford Companion to Philosophy (Oxford: Oxford University Press, 1995). This is a dictionary of general philosophy, providing concise definitions and introductions to technical terms and major philosophers
• E. D. Klemke, Robert Hollinger, and A. David Kline, eds., Introductory Readings in the Philosophy of Science, revised ed. (Buffalo: Prometheus Books, 1988).
• W.H. Newton-Smith, ed. A Companion to the Philosophy of Science (Oxford: Blackwell, 2000). This contains medium-length articles on key topics in the philosophy of science.
• Philip P. Wiener, ed., Readings in Philosophy of Science (New York: Charles Scribner's Sons, 1953).