

PHIL10015 – Introduction to the Philosophy of Science

Teaching Block: First Semester

Lecturer: Emma Tobin

Day & Time: Thursdays @ 5pm

Office: 2.2. 7 Woodland Road

You can contact me by e-mail Emma.Tobin@bristol.ac.uk or telephone 331 8022 if you wish to arrange an appointment. My office hours are 10-12noon on Thursdays. Please check your e-mail regularly for information about this course.

Course Webpage:

<http://seis.bris.ac.uk/~plemt/Phil10015.html>

Course Description:

The aim of this course is to introduce some of the important problems in the Philosophy of Science. You will study major positions in the Philosophy of Science such as Inductivism (Bacon), Logical Empiricism (Ayer), Falsificationism (Popper), Incommensurability (Kuhn) and Relativism (Feyerabend). The problems of induction, confirmation, objectivity, underdetermination and realism will be discussed. We will discuss these issues against the backdrop of more general distinctions between 'Science and Pseudo-Science' and 'Science and Metaphysics'. This course will prepare you for more advanced courses that you may choose to take in the later years of your Philosophy course.

Credit Points:

10 credit points

Methods of Assessment:

The assessment for this course is based on a two-hour examination in which you will be required to answer two questions out of eight.

Lecture Outline:

Lecture 1 (Thurs 9th October 2008) : Science and Pseudoscience

Lecture 2 (Thurs 16th October 2008): Bacon's Inductivism and the Scientific Revolution

Lecture 3 (Thurs 23rd October 2008): Problems of Induction and Confirmation

Lecture 4 (Thurs 30th October 2008): Ayer, Logical Empiricism and the Unity of Science

Lecture 5 (Thurs 6th November 2008): Popper and Falsificationism

Lecture 6 (Thurs 13th November 2008): Kuhn -Revolution & Rationality

Lecture 7 (Thurs 20th November 2008): Feyerabend and Relativism

Lecture 8 (Thurs 27th November 2008): Realism and Anti-Realism

Lecture 9 (Thurs 4th December 2008): Scientific Explanation

Lecture 10 (Thurs 11th December 2008): Laws of Nature

Reading List:

(Copies of any text marked with * are available in the library, those marked ** also have some copies in the short term section.)

Core Texts:

The core texts/readings for this course are:

- Ladyman, James. (2002) *Understanding Philosophy of Science* London; London: Routledge. **
- Course Booklet (Collection of Selected Readings, available from the Philosophy Department Office)

General Reading:

Introductory Texts:

- Bird, A. (1998) *Philosophy of Science*, London & New York: Routledge. **
- Chalmers, A. (1978) *What is this thing called Science?* Berkshire, Open University Press.*
- Okasha, Samir. (2002) *Philosophy of Science: A very short Introduction*, Oxford: Oxford University Press. *
- Rosenberg, Alexander (2000) *Philosophy of Science: A Contemporary Introduction*. London; New York: Routledge. *

Anthologies:

- *Philosophy of Science: The Central Issues*, Martin Curd, J.A. Cover, (eds.) New York; London: W.W. Norton, 1998. **
- *The Philosophy of Science*, Richard Boyd, Philip Gasper, and J.D. Trout (eds.) Cambridge, Mass ; London: MIT Press, 1991. **
- *Introduction to the Philosophy of Science* Salmon, M. et al. (eds.) Indianapolis: Hackett Publishing Company, Inc. 1999. **
- *The Philosophy of Science: Oxford Readings in Philosophy*, David Papineau (ed.) Oxford: Oxford University Press, 1996. *

Lecture Reading:

Lecture 1: Science and Pseudoscience

- Ladyman, James. (2002) *Understanding Philosophy of Science* London: Routledge. Introduction.
- Lakatos, Imre. (1973) 'Science & Pseudoscience' in Curd & Cover (eds.) (Course Booklet).
- Thagard, Paul. R. 'Why Astrology is a Pseudo-Science' (Course Booklet)

Other Recommended Reading:

- Hanson, Sven Ove. (2008) 'Science & Pseudoscience' *Stanford Encyclopedia of Philosophy*.
- Ruse. M. 'Creation Science is Not Science' in Curd & Cover (eds.)

Lecture 2: Bacon's Inductivism and the Scientific Revolution

- Ladyman, James. (2002) *Understanding Philosophy of Science* London; Routledge. Chapter 1.
- Bacon, F. *Novum Organum* – Bacon (Course Booklet)

Other Recommended Reading:

- Peltonen, M. (ed.) (1996), *The Cambridge Companion to Bacon*, Cambridge.
- Hesse, M. B. (1964), 'Francis Bacon's Philosophy of Science', *A Critical History of Western Philosophy*, D. J. O'Connor (ed.) New York : 141—52.
- Popper, Karl. (1963) *Conjectures & Refutations* London: Routledge & Kegan Paul, Chapter 3.
- Klein, Juergen. *Francis Bacon*, Stanford Encyclopedia of Philosophy.
- Zegorin, Perez. (2001) 'Francis Bacon's Concept of Objectivity and the Concept of the Idols of the Mind', *British Journal for the History of Science*, 34(4): 379–393.

Lecture 3: The Problem of Induction

- Ladyman, James. (2002) *Understanding Philosophy of Science* London: Routledge. Chapter 2.
- Hume, D. *An Enquiry Concerning Human Understanding*, Pt 11:V:1-21 & Pt II:VII–1-30 (Course Booklet)
- Goodman, N. (1979) *Fact Fiction Forecast*, Harvard University Press, Cambridge Mass. Chapter 3. ** (Course Booklet)

Other Recommended Reading:

- Chalmers, A. (1978) *What is this thing called Science?* Berkshire : Open University Press. * Chapter 4.
- Curd & Cover (eds.) – Chapters 4 & 5.
- *The Cambridge Companion to Hume*, David Norton (ed.), Cambridge University Press, Cambridge. *
- Swinburne, R.G. (1970) 'Choosing between Confirmation Theories' *Philosophy of Science*, 37(4): 602–613.
- Vickers, J. (2006) 'The Problem of Induction' *Stanford Encyclopedia Online*.

Lecture 4: Ayer, Logical Empiricism and the Unity of Science

- Ayer, A. J. 'The Elimination of Metaphysics', *Language, Truth and Logic*, Dover Publications Inc, 13-29. (Course Booklet)
- Oppenheim, P. & Putnam, H. (1958) "Unity of Science as a Working Hypothesis", in H. Feigl, M. Scriven, and G. Maxwell (eds.), *Minnesota Studies in the Philosophy of Science*, Vol II, Minneapolis: University of Minneapolis Press: 3-36. Reprinted in Gasper & Trout (eds.) 405 – 427. (Course Booklet)

Other Recommended Reading:

- Ayer, A.J. (1940), *The Foundations of Empirical Knowledge*, London: Macmillan.
- Ayer, A.J. (1954), *Philosophical Essays*, London: Macmillan.
- MacDonald, Graham. (2005) 'Alfred, Jules Ayer' *Stanford Encyclopedia of Philosophy*.

Lecture 5: Popper & Falsificationism

- Ladyman, James. (2002) *Understanding Philosophy of Science* London : Routledge. – Chapter 3. **
- Popper, K. ‘The Problem of Induction’, *The Logic of Scientific Discovery*, New York: Basic Books, 1959: 27-34. In Curd & Cover (eds.) (Also Available in the Course Booklet)
- Popper, K. (1963) ‘Science, Conjectures and Refutations’ *Conjectures and Refutations*, London: Routledge and Kegan Paul: 33-39.

Other Recommended Reading:

- Chalmers, A. (1978) *What is this thing called Science?* Berkshire: Open University Press. Chapter 5-7. *
- Grünbaum, A. (1976) ‘Is the Method of Bold Conjectures and Attempted Refutations Justifiably the Method of Science?’, *British Journal for the Philosophy of Science* 27: 105-136.
- Mellor, D.H. (1977) ‘The Popper Phenomenon’, *Philosophy* 52: 195-202.
- Popper, K. (1959) *The Logic Of Scientific Discovery*. New York: Basic Books. **
- Popper, K. (1963) *Conjectures and Refutations*, London: Routledge and Kegan Paul.
- Schilpp, P.A. (ed) *The Philosophy of Karl Popper*. La Salle: Open Court Press, 1974. *
- Thornton, Stephen (2006) ‘Karl Popper’, *Stanford Encyclopedia Online*.

Lecture 6: Kuhn – Revolution & Rationality

- Ladyman, James. (2002) *Understanding Philosophy of Science* London: Routledge. Chapter 4. **
- Kuhn Thomas, S. (1970) ‘The Structure and Necessity of Scientific Revolution’, in Curd & J.A. Cover (eds.) (Course Booklet)

Other Recommended Reading:

- Bird, Alexander. (2000) *Thomas Kuhn* Chesham: Acumen. **
- Bird, Alexander. (2004) ‘Thomas Kuhn’, *Stanford Encyclopedia of Philosophy*.
- Bird, Alexander. (2005) ‘Naturalizing Kuhn’ *Proceedings of the Aristotelian Society* 105: 109-127.
- Chalmers, A. (1978) *What is this thing called Science?* Open University Press, Berkshire.* Chapter 8.
- Hacking, I. (ed.) (1981), *Scientific Revolutions*, Oxford: Oxford University Press. **
- Hoyningen-Huene, P. (1989), *Die Wissenschaftsphilosophie Thomas S. Kuhns: Rekonstruktion und Grundlagenprobleme*, translated as Hoyningen-Huene, P. (1993) *Reconstructing Scientific Revolutions: Thomas S. Kuhn's Philosophy of Science*, Chicago: University of Chicago Press. *
- Kuhn, Thomas, S. (1962) *The Structure of Scientific Revolutions*, Chicago, The University of Chicago Press. **
- Kuhn, T. (1982), “Commensurability, Comparability, Communicability”, *Proceedings of the Biennial Meeting of the Philosophy of Science Association* II: 669-688.

Lecture 7: Feyerabend & Relativism

- Ladyman, James. (2002) *Understanding Philosophy of Science* London, Routledge. – Chapter 4
- Reading from Feyerabend (1975) *Against Method* Verso, London : 256-271. (Course Booklet)

Other Recommended Reading:

- Chalmers, A. (1978) *What is this thing called Science?** Berkshire, Open University Press,* Chapter 10.
- Feyerabend, Paul. (1975) *Against Method*, London, Verso.
- Laudan, L. (1989) 'For Method: or, Against Feyerabend', in J.R.Brown & J.Mittelstrass (eds.), *An Intimate Relation*. Dordrecht: Kluwer.
- Meynell, Hugo. (1978), 'Feyerabend's Method', *The Philosophical Quarterly*, 28(112): 242–252.
- Preston, John (2006) 'Paul Feyerabend' *Stanford Encyclopedia Online*.
- Munévar, G. & Lamb, D. (eds.), (2000) *The Worst Enemy of Science? Essays in Memory of Paul Feyerabend*, New York, Oxford University Press.

Lecture 8: Realism & Anti-Realism

- Ladyman, James. (2002) *Understanding Philosophy of Science*, London: Routledge. Chapters 5 and 6. **
- Boyd, Richard. (1983) 'On the Current Status of the Issue of Scientific Realism', *Erkenntnis*, 19: 45–90. (Course Booklet)
- Maxwell, G. (1962): 'The ontological status of theoretical entities', in H. Feigl and G. Maxwell (Eds.), *Minnesota Studies in the Philosophy of Science* Volume III (University of Minnesota Press: Minneapolis): 3-27. (Course Booklet)

Other Recommended Reading:

- Boyd, Richard. (2002) 'Scientific Realism', *Stanford Encyclopedia of Philosophy*.
- Cartwright, Nancy, (1983) *How the Laws of Physics Lie*, Oxford: Oxford University Press, Essays 2–4, 6 and 8. *
- Curd & Cover (eds.) Chapter 9. *
- Chalmers, Alan. (1978) *What is this thing called Science?*, Berkshire: Open University Press, Chapter 15.*
- Laudan L. and Leplin J. (1991) 'Empirical Equivalence and Underdetermination' *Journal of Philosophy* LXXXVIII(9): 449–72.
- Psillos, Stathis. (1996) 'Scientific Realism and the Pessimistic Induction', *Philosophy of Science* 63, Proceedings of the 1996 Biennial Meetings of the Philosophy of Science Association. Pt. I: Contributed Papers: S306–S314.
- Psillos, Stathis. (1999) *Scientific Realism : How Science Tracks Truth*, London Routledge. *
- Van Fraassen, Bas Van. (1976) 'To Save the Phenomena', *Journal of Philosophy*, 73. No. 18: 623–32. (Reprinted in Boyd et al (eds.)
- Van Fraassen, Bas Van (1980), *The Scientific Image*, London, Clarendon Press.

Lecture 9: Scientific Explanation

- Ladyman, James. (2002) *Understanding Philosophy of Science* London : Routledge. Chapter 7. **
- Hempel, C. (1948), “Studies in the Logic of Explanation”, *Philosophy of Science* 15(2) :135-175 (Course Booklet)

Other Recommended Reading :

- Bird, A. (1998), *Philosophy of Science*, London & New York: Routledge, Ch. 2. **
- Bromberger, S., (1966), “Why Questions”, in *Mind and Cosmos: Essays in Contemporary Science and Philosophy*, R. Colodny, (ed), Pittsburgh: University of Pittsburgh Press. Curd & Cover (eds.) *Philosophy of Science: The Central Issues*, Norton & Company, 1998, Ch. 6.
- Hempel, C. (1965), *Aspects of Scientific Explanation*, New York, The Free Press. *
- Kitcher, P. (1981), “Explanatory Unification”, *Philosophy of Science*, 48: 507-531.
- Psillos, S. (2002), *Causation & Explanation*, *Acumen*, 215- 293, Ch. 3. **
- Salmon, W., (1989), *Four Decades of Scientific Explanation*, Minneapolis: University of Minnesota Press. *
- Van Fraassen, B.V. (1981), “The Pragmatics of Explanation”, *American Philosophical Quarterly*, 14: 143 – 150.
- Woodward, J. (2003), “Scientific Explanation”, *Stanford Encyclopedia of Philosophy*.

Lecture 10: Laws of Nature

- Dretske, F., (1977), “Laws of Nature”, *Philosophy of Science*, 44: 248-268. (Also Available in Course Booklet)

Other Recommended Reading:

- Armstrong, D. (1983), *What is a Law of Nature?* Cambridge, Cambridge University Press. *
- Bird, A. (1998), *Philosophy of Science*, London & New York: Routledge, Ch. 1. **
- Bird, A. (2005), “The Dispositionalist Conception of Laws” *Foundations of Science* 10 : 353-70.
- Carroll, J.W., “Laws of Nature”, *Stanford Encyclopedia of Philosophy*
- Curd & Cover (eds.) *Philosophy of Science: The Central Issues*, Norton & Company, 1998, Ch. 7.
- Kincaid, H. (1990), “Defending Laws in the Social Sciences”, *Philosophy of Social Science*, 20.
- Lewis, D. (1983), “New Work for a Theory of Universals”, *Australasian Journal of Philosophy*, 61: 343-377.
- Psillos, S. (2002), *Causation & Explanation*, *Acumen*, 137-211, Ch. 2.
- Scriven, M. (1956), “A Possible Distinction Between Traditional Scientific Disciplines and the Study of Human Behavior”, *Minnesota Studies in the Philosophy of Science*, 1.
- Tooley, M. (1977), “The Nature of Laws”, *Canadian Journal of Philosophy*, 7: 667-698.