

Syllabus

The course will present an introduction to the topics that have been at the heart of the philosophy of science for the past one hundred years or so. After some background about earlier philosophy of science we will explore attempts to understand the scientific method, the process and structure of the scientific enterprise itself, and answer other more traditional philosophical questions about the nature of science and its objects of study. The last few weeks of the semester will be spent exploring specific sciences and the nature of social science.

This syllabus should be considered a “living document.” It may evolve as the semester wears on. We shall try to make it through the whole textbook and cover a bit more. Student interest and feedback will play some role in how the course develops and the questions it will pursue.

Texts: *Theory and Reality* by Peter Godfrey-Smith **(G-S)**, University of Chicago Press, 2003. There will also be a number of books on reserve **(R)** at the library and I will make other readings available electronically **(E)**. Generally, each chapter in our text will be supplemented with a primary text to give you a feel for the respective debates as they were playing out at the time.

Course requirements: The course will require you to read the assigned materials, write two papers of about 10-15 pages long (the first due on 4/8, the second due on 5/27), and submit a number of short homework assignments.

Class 1:

Introduction to the course. Introduction to the relevant parts of philosophy. Introduction to philosophy of science.

Reading: G-S Ch. 1

Hempel, Carl G. Ch 2 of *Philosophy of Natural Science* (R)

Classes 2 and 3:

Background to philosophy of science. What is “the” scientific method? Is there knowledge that is necessary, certain, and universal? Whirlwind tour of Aristotle, Bacon, Descartes, Copernicus, Galileo, Hobbes, Kepler, Newton, Locke, Hume, Kant, Fourier, and others.

No readings.

Classes 4 and 5:

The logical empiricist tradition, including discussions of Hume, Kant, the Vienna Circle, and logical positivism.

Reading: G-S Ch 2

M. Schlick “Positivism and Realism” (Optional (E))

Class 6:

The problems of induction, Hume and Goodman. Grue. What is evidence?

Reading: G-S Ch 3
Nelson Goodman, Ch 3 of *Fact, Fiction, and Forecast* (R)

Class 7:

Popper and falsificationism.

Reading: G-S Ch. 4

Classes 8 and 9:

Kuhn and the structure of science.

Reading: G-S Ch 5 & 6
Kuhn. *The Structure of Scientific Revolutions* (Optional (R))

Class 10:

After *Structure*. Lakatos, Laudan, and Feyerabend.

Reading: G-S Ch 7
I. Lakatos. "Falsification and the methodology of scientific research programs" in *Criticism and the Growth of knowledge*. (R).
Feyerabend *Against Method* (Optional (R))

Class 11:

The Sociology of Science.

Reading: G-S Ch 8.
R. K. Merton "The reward system of science (E)
Latour and Woolgar's *Laboratory Life*, pp 200-208. (E)

Class 12:

Feminism and Science studies.

Reading: G-S Ch 9.
Sandra Harding "Feminist justificatory Strategies (E)
Alan Sokol "Transgressing the boundary: Toward a Transformative Hermeneutics of Quantum Gravity." and "A Physicist experiments with cultural studies." Both articles available here:
<http://www.physics.nyu.edu/sokal/#papers> (Skim these)

Class 13:

Quine and naturalism. The response to positivism. The theory-ladenness of observation.

Reading: G-S Ch 10
W. V. Quine "Epistemology naturalized" in *Ontological Relativity and Other Essays* (R)

Class 14:

Naturalism and the social structure of science

Reading: G-S Ch 11

Class 15 and 16:

Scientific Realism. Is there are reason to believe that science works and is talking about real objects?

Readings: G-S Ch. 12

Mizrahi, M. "Why the ultimate argument for scientific realism ultimately fails" (E)

Mizrahi "The pessimistic induction: A bad argument gone too far" (E)

van Fraassen from *The Scientific Image* pp 6-21 (R)

Class 17 and 18:

How does science explain?: causal, unification, and constructive empiricist approaches.

Reading: Hempel. Ch 5 of *Philosophy of Natural Science* (R).

M. Friedman "Explanation and scientific understanding" (E)

G-S Ch 13

Class 19:

Bayesianism and modern theories of evidence.

Reading: G-S Ch 14

Class 20:

Philosophy of mathematics. The applicability of mathematics to natural science.

Reading: Wigner, E. "The Unreasonable Effectiveness of Mathematics to Natural Science"

(Available at: <http://www.dartmouth.edu/~matc/MathDrama/reading/Wigner.html>)

Class 21:

Philosophy of biology. Introduction. What is a unit of selection in evolutionary biology?

Reading: From Elliot Sober's *Philosophy of Biology*. Ch 4. (E)

Class 22:

Philosophy of psychology. Introduction. Is the mind Modular?

Reading: Jay A. Garfield's "Modularity" in Samuel Guttenplan's *A Companion to the Philosophy of Mind*. (E)

Classes 23 - 26:

Philosophy of the social sciences. What is a social fact? How do the social sciences explain? What is being explained?

Readings: Alexander Rosenberg. Ch 1 from *Philosophy of Social Science* (E)

Fritz Machlup "Are the Social Sciences really inferior?" (E)

Durkheim "Social facts" (E)

Searle "What is an Institution?" (E)

Class 27:

Concluding discussion. No readings.