

Introduction to the Philosophy of Science

HPS/PI 120

Winter 2010

Instructor: Christopher Hitchcock
Office: 210 Dabney
Phone: 3602
e-mail: cricky@caltech.edu
Office Hours: By appointment, or call first and stop by
Course Website: <https://courses.hss.caltech.edu/Winter2010/hps-pl120>
Course Listserv: Hps-pl120@hss.caltech.edu

Description: In this course, we will read three of the most influential works in the philosophy of science from the last century: Karl Popper's *The Logic of Scientific Discovery* (first published in 1934); Thomas Kuhn's *The Structure of Scientific Revolutions* (first published in 1962); and Michael Friedman's *Dynamics of Reason* (2001). Each of these works presents a distinctive picture of the enterprise of science. In the course of discussing these works, we will encounter many of the fundamental problems of philosophy of science: What are the characteristics of science that distinguish it from other intellectual endeavors? In what sense does science provide us with knowledge? Do we have good reason for believing that our best scientific theories are true? In what sense does science progress? Does it advance in an orderly fashion, or does it undergo dynamic upheavals? Is science a rational enterprise? In what does the rationality of science consist? Is scientific knowledge objective? In what does the objectivity of science consist?

Pre-requisite: Students must have completed their Freshman Humanities requirement in order to enroll in this course.

Class Meetings: Tuesdays 7:00 – 10:00 P.M., Baxter 125.

Books: There are three books to be purchased for this course: *The Logic of Scientific Discovery*, by Karl Popper; *The Structure of Scientific Revolutions*, by Thomas Kuhn; and *Dynamics of Reason*, by Michael Friedman. These books may be ordered through Caltech's online bookstore (<http://bookstore.mbsdirect.net/caltech.htm>).

Course Listserv: If you pre-registered, you should already be signed up for the class listserv. You will receive an e-mail with instructions. If you add the class, be sure and send your e-mail address to the instructor so that you can be added to the listserv.

Evaluation: Grades for this course will be based upon class participation (15%), performance as a discussion leader (10%), and upon two or three papers (75%). All aspects of evaluation come under the provenance of the university's honor code. A student must receive a passing grade on *each* of these components in order to pass the course.

Class Participation: Philosophy is a communal enterprise: the ability to make valuable oral contributions to philosophical discussions can be as important as the ability to write well. Moreover, since the written assignments will force the students to think carefully about very specific topics, participation in class discussion is an important way for students to demonstrate a broader competence with the material than is possible in the papers alone. Evaluation will be based upon the quality, not the quantity, of comments made during class. Students are encouraged to continue class discussions after the class is over, by meeting with me in person, or continuing the discussion over e-mail, or posting to the course website. Students who for any reason have difficulty speaking up in class are especially encouraged to pursue these options. It should go without saying that *attendance* is an absolutely essential component of class participation. Any student who has more than one absence from class will be required to do make-up work for the classes missed.

Discussion Leaders: Starting with the third week of class (January 19) students in the course will take turns being discussion leaders for specific classes. Discussion leaders will not be required to present the material, but they will provide the agenda for the class. In particular, discussion leaders should make note of which parts of the reading material were particularly difficult or in need of further elaboration from the instructor (preferably after consulting with other members of the class). In addition, they should prepare a list of questions, criticisms, and comments in order to facilitate class discussion. These are to be distributed via the course listserv at least 24 hours before class meeting. Discussion leader assignments will be chosen in the second class (Jan. 12). Worksheets will be passed out at that time to help discussion leaders prepare.

Papers: Students have a choice between writing three short papers (approximately 1500 words or 5 typed, double-spaced pages), worth 25% each; or one short paper and one long paper (approximately 3000 words, or 10 typed, double-spaced pages), worth 30% and 45% each (respectively). Students must announce which option they choose by the third week of class (January 19). The first short paper will be due in class on February 2. The second short paper (for those pursuing that option) will be due in class on February 23. The final paper (third short paper, or long paper), will be due at 5:00 P.M. on Wednesday, March 17. Suggestions for paper topics will be distributed via the class listserv or the course website.

Optional fun project: Two bonus points (out of 100) will be awarded to the creator of funniest philosophy action figure (as voted by the class), based on the three authors from this class. See <http://homepages.nyu.edu/~iav202/powers/powers.html> for examples.

Special Accommodations: If you have a disability or personal circumstance that will require special accommodation, please do not hesitate to contact the instructor.

Readings: The following calendar shows when various readings will be covered in class. Readings should be completed *before* they are covered in class. If you encounter any problems with a reading assignment — e.g., if the instructions are unclear — please contact me immediately by phone or e-mail; do not wait until the next class meeting. Suggestions for further readings, which may be useful for writing assignments or discussion leader duties, are provided at the end of the syllabus.

Course Calendar

1/5	Introduction and Logistics
1/12	Popper, <i>The Logic of Scientific Discovery</i> , Chapters 1 – 3
1/19	Popper, Chapters 4 – 6
1/26	Popper, Chapters 7, 10
2/2	Kuhn, <i>The Structure of Scientific Revolutions</i> , Chapters 1 – 5
2/9	Kuhn, Chapters 6 – 9
2/16	Kuhn, Chapters 10 – 13
2/23	Friedman, <i>Dynamics of Reason</i> , pp. 3 – 46
3/2	Friedman, pp. 47 – 92
3/9	Friedman, pp. 93 - 129

Other Important Dates

1/12	Scheduling of discussion leader assignments
1/19	Selection of paper options
1/22	Last day to add class
2/2	First paper due
2/23	Second short paper due
2/24	Last day to drop course or change grading option to P/F
3/17	Final paper due

Suggestions for Further Reading: The best on-line resource for philosophy is the Stanford Encyclopedia of Philosophy, at <http://plato.stanford.edu/>. Entries relevant to this course include:

Incommensurability of scientific theories; Induction, problem of; Kuhn; Popper; Science, theory and observation in; Science and Pseudo-science; Scientific knowledge, social dimensions of; scientific progress; scientific realism; scientific revolutions; scientific unity; underdetermination of scientific theories; Vienna Circle.

In addition, the following books have been placed on reserve in Dabney library:

Gutting, *Paradigms and Revolutions*

Hacking, *Scientific Revolutions*
Hoyningen-Huehe, *Reconstructing Scientific Revolutions*
Kitcher, *The Advancement of Science*
Kuhn, *The Essential Tension*
Kuhn, *The Road Since Structure*
Lakatos, *The Methodology of Scientific Research Programs*
Popper, *Conjectures and Refutations*
Schilpp, *The Philosophy of Karl Popper*