Introduction to Philosophy of Science
Fall 2012

Instructor: Carl F. Craver ccraver@artsci.wustl.edu (Wilson 106)
Office hours: Mondays after class and by appointment

Location: Green Hall L0159; 10-11:30

Description: We will discuss the nature, aims, and limitations of science. Class will have a lecture/discussion format.

Objectives: To introduce students to key debates and issues in the philosophy of science. To introduce students to the history of the philosophy of science. To deepen skills in reading philosophical texts. To develop skills for writing philosophical arguments and prose. To prepare students for deeper investigations in the philosophy of science.

Textbooks:

*Curd, M. and Cover, J.A. *Philosophy of Science: The Central Issues*. New York: Norton (CC below)
*Godfrey-Smith, P. *Theory and Reality: An introduction to the Philosophy of Science* University of Chicago Press. (GS below)
*T = Telesis

Organization:

The course will cover roughly 5 major topics in the philosophy of science. Regular interstitial discussion classes are meant to allow for free discussion throughout lectures.

Grading:

One Exam: 30%.
Best two of three papers: 30% each
Attendance: 10%

Exams: The final exam will be a cumulative essay exam. It will have three questions probing basic concepts from the course at different depths. Questions may mention assigned readings not discussed in class. The Syllabus is a rough guide to the final exam.

Papers: You will write two or three original papers (5 pages each). The default paper topic in each case is:

Identify one central argument in one or more of the readings on this topic. Clearly state the premises and the conclusion of the argument. Discuss possible objections to this argument and explain why you do or do not find those objections compelling. (If you wish to address an aternative to the default topic, please feel free to write a brief, one paragraph description of your planned paper).

Papers are to be 5-7 pages long and are to have standard margins (1" top and bottom, 1.25 L and R). *Papers longer than 7 pages will be returned without a grade and treated as late from the due-date of the paper. Condensation is a useful intellectual enterprise.*

Papers will be evaluated on 1) a basic grasp of the issue, argument, and relevant reading material, 2) capacity for creative or original insight, and 3) exposition (grammar, prose, composition). Please note that plagiarism of any sort will result in failure of the course and disciplinary action.

Attendance: You are required to show up and participate. Merely showing up is sufficient for a B in attendance unless your presence is problematic, in which case you might score lower than a B. Your discussion should reflect an understanding of the readings for each week.

Reading: You are expected to keep up with the readings. Readings to be discussed are those listed for that day in the syllabus. It often helps to take notes when reading philosophy. Papers and exams will be graded under the assumption that students have mastered all of the reading material.

Lateness: Papers are due by 5 PM on the due date. Late papers will drop in final score by one letter grade per day. Unless otherwise specified, papers are to be delivered in hard copy to the Departmental Dropbox in the philosophy office in Wilson Hall.

Schedule	Readings
8/28 Introduction	GS 1

Topic 1 Positivism and Demarcation

8/30 Positivism	GS 2 Ayer CC
9/04 Demarcation	Thagard CC 27 Feyerabend T
9/06 Demarcation: Evolution	Ruse CC 38 Laudan CC 48 Ruse CC 54
9/11 CLASS CANCELED	Galileo, Letter to the Grande Duchess (T) http://www.fordham.edu/halsall/mod/galileo-tuscany.asp
9/13 CLASS CANCELED	Watch "Ayer on Logical Positivism" 1-4 Youtube
9/18 Intelligent Design?	Behe T Sober T

Questions:

1) What are the central commitments of logical positivism? Why did the positivists find those commitments appealing? How did they think about the goals of their theories?

2) What is the problem of demarcation? Is there an adequate solution to that problem?

3) What are the strengths and weaknesses of the verifiability criterion of meaning? How is this criterion related to the theory/observation distinction?

4) Is Creation Science or the study of intelligent design a science? Is mathematics a science? Is computer science a science? Are there other significant intellectual divides for which a criterion of demarcation would be helpful?

5) Do we really need a criterion of demarcation? Is the relevant distinction between science and non-science? Or is it the difference rather between good science and bad science? And what is that distinction?

Topic 2 Induction and Evidence

9/20	The problems of induction	Lipton CC 412
9/25	Positivist approaches to confirmation	GS 3
9/27	Popper	Popper CC 3 and 427

	PAPER 1 DUE	
10/02	Discussion	GS 4
10/04	Under-Determination	CC 355-382
10/09	Experimenter's Regress	
	Alan Franklin "How to Avoid the Experimenter's Regress" Available online.	
	H. M. Collins (1994). A Strong Confirmation of the Experimenters' Regress. *Studies in History and Philosophy of Science Part A* 25 (3):493-503.	

Questions:

1) Is Popper's criterion of demarcation more promising than the positivists?

2) What is the problem of induction? How can it be stated most forcefully?

3) How is Goodman's riddle different from Hume's problem? What is the point of the ravens paradox?

4) In what ways does the conditional updating of Bayesian confirmation mirror the inductive practices of science? Must it do so?

5) Does Popper's falsificationism avoid the problem of induction? Does Bayesianism?

Topic 3 History and The Advance of Relativism

10/11	Kuhn and Normal Science	Kuhn CC 86
10/16	Discussion	GS 5
10/18	Kuhn and Revolution	Kuhn CC 102
		GS 6

Questions:

1) What is relativism? Is Kuhn a relativist? Is relativism an inevitable consequence of his views?

2) What is normal science? What role does it play in scientific progress? What brings periods of normal science to a crisis?

3) What is the structure of scientific revolutions? What are paradigms? How are disciplinary matrices different from theories?

4) To what extent are Kuhn's challenges to scientific realism predicated on a positivist understanding of science?

Topic 4 Philosophy and the Tenability of Realism

10/23	Arguments concerning realism	van Fraassen CC 1064
10/25	Discussion	GS 12
10/30	Intervention and Realism	Hacking CC 1153
	PAPER 2 DUE	
11/1	Discussion	Resnick CC 1169
11/6	Models and Idealization	Godfrey-Smith; Bokulich, A. (Telesis)

1) What is scientific realism? Should it be defined in terms of current sciences, in terms of some ideal science, or some other way?

2) What is Hacking's view of the relationship between realism and intervention. Does it overcome the motivations of the relativist?

3) Does science exhibit a history of success? Is that history best explained by scientific realism?

4) What is the broader significance of the truth of realism? Can we distinguish science from non-science if we are not realists? If we are not realists, is our only option to become relativists?

Topic 5 Laws and Explanation

11/8	Covering-law model	Hempel CC 685, 695
11/13	Probablistic Explanation	Railton CC 746
11/15	Class Canceled	
11/20	Unification	Craver Ch 2
11/27	Causation	Craver Ch 3
11/29	Dispositions	TBA
11/4	Applied and Basic Knwoledge	TBA
11/6	Last Day	EXAM DISCUSSION
	Paper 3 Due	
	FINAL PAPER DUE	

FINAL EXAM AT SCHOOL-APPOINTED TIME AND PLACE

Questions

1) What is the goal of developing a philosophical analysis of explanation? Is it the same as developing a psychological analysis of understanding?

2) What is the fundamental difference between the causal-mechanical view of explanation and the CL model?

3) What is a law of nature? Are there laws of biology?

4) What is the intellectual appeal of the unification model? Most all explanations unify?