

Philosophy of Science

Section: PHILOS/LPS 40, Fall 2014

**Day/Time: MWF 10-10:50 Classroom:**

**Instructor:** B. Holman **Office:** SST 740 **e-mail:** bholman@uci.edu

**Office hours:**

Time: Wed (11- 12 or when students are done whichever comes first)

Location: Held outside of class

Time Fri (2-3)

Location: HICF 100M

**Description:** Contemporary scientific inquiry is widely regarded as the most successful knowledge-gathering enterprise ever developed in the course of human history. This course will explore the nature and character of that enterprise in an effort to uncover the features that make a given investigation a distinctively scientific one, ranging from the characteristic methods of scientific investigation to the distinctive characteristics of scientific theories, explanation, and confirmation. We will use particular examples to explore whether and how those features transform scientific inquiry into a uniquely powerful tool for gaining knowledge about the world. In the first half of the course we will develop four different perspectives on scientific inquiry and scientific knowledge (Logical Positivism, Scientific Realism, Pragmatism, & Relativism). In the second half of course we will put these positions in dialogue with each other regarding six questions:

- 1) What kind of progress (if any) is achieved by the scientific endeavor?
- 2) To what extent (if any) is the choice of theory unconstrained by empirical evidence?
- 3) To what extent can individual hypotheses be tested by experiment?
- 4) By what criteria should a scientific theory be judged?
- 5) Can scientific theories be compared to each other?
- 6) How much of scientific theory choice is driven by nonepistemic considerations?

In closing we will examine one attempt (Solomon's) to include social influences into an account of scientific rationality. In closing, we will ask whether the problems that seem to emerge when considering individual scientists dissolve when the focus is broadened to the scientific community.

Requirements:

### **0. Participation (Bonus)**

Active and informed participation: Students are expected to come to class prepared and ready to engage in an informed discussion of the material. Students are expected to actively participate in classroom discussions. Participation includes asking questions, raising objections, offering defenses, commenting on the significance of a point, clarifying an argument or a claim, and drawing out the connections between an issue from our current discussion and issues raised in our other readings. Substantial contributions can raise your grade.

### 1. Study questions (30%)

Before lecture on Fridays (10 am), students will turn in short answers to six questions posed at the end of the chapters reading. Questions for weeks 6-10 will be posted on the class website. Please note that answers do not simply require a recapitulation of the information provided in the chapter. Rather the questions raise fundamental questions about the philosophical theories discussed. Students are invited to disagree with the author, bring up examples, arguments, and other considerations on which the text is silent and make up their own minds.

To merit full marks students will need to read and think critically about the material. While answering the study questions students should make reference to reading material (please cite page numbers). Attempting to answer the questions without reading the material is strongly discouraged as such responses are likely to receive failing marks (at best cannot hope to exceed a C).

On Friday at the end a class a student will randomly select one of the six questions to be graded using the all-wise question selecting device.

Week 1 (M,W,F)	Chapter 3	Problems 2,3,5	Chapter 4	Problems 3,7,8
Week 2 (M)	Chapter 5	Problems 1,4	<b>Look</b>	<b>Below!!!</b>
Week 2 (W,F)	Chapter 6	Problems 2,3	Chapter 13	Problems 4,5
Week 3(M,W,F)	Chapter 10	Problems 1,4	Chapter 11	Problems 1,2,3,4
Week 4 (M,W,F)	Chem. Rev.	See PDF	Chapter 12	Problems 1,3,6
Week 5 (M,W,F)	Chapter 8	Problems 3,4,5	Chapter 14	Problems 2

### 2. Midterm (30% of the final grade):

The Midterm will consist of a subset of the questions answered in the weekly study questions. On the exams students will receive 6 questions of which they will choose and answer 5. Whether a question has already been graded as part of the weekly study questions will have no bearing on whether it appears on the mid-term.

### 3. Final exam (40% of final grade):

The final exam will also consist of a subset of the questions answered in the weekly study questions. It will consist of 3 questions from the first half (of the class of which the student will answer 2), 5 questions from the second half (of which the student will answer 4), and 3 essay questions (of which the student will answer 2). Whether a question has already been graded as part of the weekly study questions or the midterm will have no bearing on whether it appears on the final.

### Class policies:

**Academic Integrity:** Plagiarism, cheating, etc. will not be tolerated and the University policy on Academic Honesty will be followed strictly. Students who have any questions or uncertainty whatsoever about this policy are responsible for meeting individually with the instructor to discuss the policy. Anyone found violating this policy will receive an F for the course and will be reported to the appropriate University officials. I am extremely firm on this matter.

**Late assignments/exams:** Late assignments will not be accepted. Assignments are to be uploaded at the beginning of class on Friday at 10 am. There will be a 15 minute grace period after which papers will no longer be accepted (i.e. if the paper is uploaded to eee at 10:16 or after it will receive a 0). It is the student's responsibility to make sure they have turned in the right paper. If there is a mistake, it must be corrected by the due date to receive credit.

Exams can be taken earlier if the student will miss the appointed exam for a foreseeable reason; however, students must obtain permission no less than one week in advance of the exam. In severe circumstances (i.e. hospitalization, death of a family member etc.) accommodations can be made given the student can provide supporting documentation. No other exceptions to the exam schedule will be granted.

**Disabilities:** It is the student's responsibility to notify the instructor in advance of the need for accommodation of a University verified disability. I will gladly provide the required accommodations.

**Preferred names and gender pronouns:** I would like to make every effort to create a safe space. If you have a preferred name or gender pronoun that is not reflected in the roster, please let me know.

Students should also refer to the University General Catalog about standard policies and procedures

**Materials:**

1. There are three texts for this class (All other material will be available on the website):  
*Philosophy of Science* by Alex Rosenberg;  
*Science and Relativism* by Larry Laudan; and  
*Social Empiricism* by Miriam Solomon

**Schedule of Readings and notation:**

Week	Topic	Readings
0 (10/3/14)	The demarcation question	
1 (10/6/14)- (10/10/14)	Scientific Explanation: Why do Laws Explain?	M: Chapter 3 (p.39-52) W: Chapter 3 & 4 (p. 53-67) F: Chapter 4 (p.67-78)
2	Causation, Teleology	M: Chapter 5 (p. 81-89 & 93-95)

(10/13/14)- (10/17/14)	and Naturalism	W: Chapter 6 (p.97-107) ( <u>not the whole chapter!</u> ) F: Chapter 13 (p. 237-242 & 248-251)
3 (10/20/14)- (10/24/14)	Induction and Falsification	M: Chapter 10 (p. 179-192) W: Chapter 10 & 11 (p. 192-206) F: Chapter 11 (p. 206-216)
4 (10/27/14)- (10/31/14)	That's just a theory: Scientific Theories & The Historical turn	M: The Chemical Revolution [pdf] (p. 55-71) W: Chem (p. 71-77) & Chapter 12 (p. 220-225) F: Chapter 12 (p. 225-236)
5 (11/03/14)- (11/07/14)	Scientific Realism & Post-modernism	M: Chapter 8 (p. 142-153) W: Chapter 8 (p. 153-159) & Ch. 14 (253-260) F: Class canceled
6 (11/10/14)- (11/14/14)	Sociology of Science & a Dialogue on Progress	M: Mid-term W: From "Teaching the Nature of Science" [pdf] F: Science and Relativism (Chapter 1)
7 (11/17/14)- (11/21/14)	Dialogues on Underdetermination, Holism, & Standards of Success	M: Science and Relativism (Chapter 2) W: Science and Relativism (Chapter 3) F: Science and Relativism (Chapter 4)
8 (11/24/14)- (11/28/14)	Dialogues on Incommensurability & the Social Determinants of Belief	M: Science and Relativism (Chapter 5) W: Science and Relativism (Chapter 6) F: THANKSGIVING
9 (12/01/14)- (12/05/14)	Social Empiricism: Introduction, Decision Vectors, & Dissent	M: Social Empiricism (Chapter 1) W: Social Empiricism (Chapter 4) F: Social Empiricism (Chapter 5)
10 (12/08/14)- (12/12/14)	Social Empiricism: Consensus & Epistemic Fairness	M: Social Empiricism (Chapter 6) W: Social Empiricism (Chapter 7) F: Social Empiricism (Chapter 8)
Final exam		