Philosophy 209: Philosophy of Science

Class meets Monday, Wednesday and Friday in...

**Your host:** Prof. Michael P. Wolf  
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**Office Hours:** Mondays and Wednesdays 9:00-11:00 and by appointment

**Texts**  
Boyd, Gasper and Trout. *Philosophy of Science*.  
(Some additional readings will be made available as reserves or photocopies in class.)

There will also be two books on reserve:  
James Ladyman. *Understanding Philosophy of Science*.  
Peter Machamer and Michael Silberstein, eds. *The Blackwell Guide to the Philosophy of Science*.

Readings from these two sources will not be required, but they are both accessible and comprehensive sources. I strongly recommend that you read them, especially for those topics you plan to write about for your papers.

**What Is This Course About?**  
My aim in this course, as in every course I teach, is to make you do some philosophy. Just what it means to "do some philosophy" is a matter of some debate, though. If you asked twenty philosophers what it means to do philosophy, you would get somewhere between twenty-five and thirty answers. Just which questions are important, and just how we ought to pursue answers for them are not matters on which philosophers agree. The one element that seems to be common to all these conceptions of philosophy seems to be that we must give and ask for reasons for what we believe. We may judge that some reasons are better than others, and so some views may be more plausible to us. Giving and asking for reasons is a practice that belongs to all rational animals - Earthly or extraterrestrial, human or not - and this is what we will focus our attention on this course. The goal of this course is not to provide you with information (names, dates, and famous quotes) that you can recite at cocktail parties in the future, although in many cases, knowing those details is an important part of taking part in the class. Rather, my goal here is to teach you (or improve upon) a certain kind of skill: the skill of giving and asking for reasons, and evaluating the reasons other may give.

Having said that, the more narrow and informative formulation of our course topic is the philosophy of science. Just what counts as a good theory in the philosophy of science is a contentious matter, especially among people who place a great deal of credence in the content of these theories. I have also heard more than one practicing scientist assert that philosophers should mind their own business and keep out of the laboratories so the "real" work can get done. In defense of us philosophical types, I have also heard some very smart scientists give some very glib, uninsightful answers to many of these questions. If we have a task here, it is not to interfere with science as it is practiced, but to uncover what makes it so interesting. (Perhaps it will not turn out to be as interesting as we thought, but that would be a very interesting conclusion in its own right.) We will be asking questions about what makes good science vs. bad science, why some ways of building theories give us authority while others do not, what the status of laws of nature is, and whether science can be objective, just to name a few topics. We will do this by looking at recent authors on a number of topics. In most cases, these authors have been selected because they represent opposing views on a particular subject.
Assessment
Class participation is an important issue to me, especially in a small class like this. I expect you to come to class with the readings done and ready to discuss them. In order to get you involved in these ways and as an exercise in immersing yourself in the debates that motivated different philosophers to adopt the views they did, each student in this class will take part in a scheduled presentation. The presentation will involve presenting an overview of an important development in the history of science, e.g. you may discuss the development of the Michelson-Morley experiment and how it affected the field of physics. You will be expected to provide notes on what you expect to present a week in advance. The level of preparation expected here is roughly the same as a five-page paper. Details of the format and topics will be made available as we progress. This will count for 20% of your final grade. Since the number of students in this class may make it prohibitive to have everyone make such a presentation, I will make provisions for some members of the class to prepare a five page paper on a topic in lieu of such a presentation. Details on topics are available online.

There will also be days that we set aside exclusively for discussion, on which your attendance and participation will be expected. There will inevitably be discussion on other days as well, but these will be occasions on which we do more in small groups, so your personal preparation for these classes is all the more important. Some written work - summaries of arguments, etc. - based on the day's discussions will be expected on these dates. I will combine all of these factors into a class discussion grade, and it will count for 10% of your final grade. Your attendance and participation will be expected on these days.

Over the course of the quarter, you will also have to write two papers of about 2500-3000 words, which works out to about 8-10 pages in Times 12-point double spaced with one-inch margins. The two assignments will correspond roughly with the two halves of the course. I will offer you a set of paper topics well in advance of the due date and you may choose from there. You may also suggest your own paper topic and write on it SO LONG AS YOU CLEAR THE TOPIC WITH ME FIRST. Each one of these papers will be worth 35% of your final grade. More information on the assignments and how to approach these papers will be available in class.

I should mention a few things in closing. First, you are of course bound by the honor code here and any form of plagiarism will be severely punished. (Speak to me or consult a student handbook if you are unsure what counts as plagiarism.) The policy of the philosophy department on this matter is to automatically fail a student on any plagiarized assignment and to submit their names for discipline under the College’s Honor Code. This does not mean that you cannot use another source, or discuss and consult with your classmates about your assignments. I permit you to do the former and strongly encourage you to do the latter, so long as all the sources and classmates in question are properly cited in your paper. Finally, be forewarned that I reserve the right to lower the grades of papers given to me whose grammar and spelling do not meet college-level standards.

A Tentative Syllabus
(Note the provisions for the Day of Gracious Living given below.)

Class 1. (March 31): Introduction

Interpreting Theories - (click here for study questions)
Class 2. (April 2): Logical Positivism  
Read Schlick "Positivism and Realism"  
Recommended: Chapter 1 of Machamer and Silberstein (reserve)

Class 3. (April 4): Logical Positivism  
Read Schlick "Positivism and Realism" and Hempel "Laws and Their Role..."  

Class 4. (April 7): Logical Positivism  
Read Schlick "Positivism and Realism" and Hempel "Laws and Their Role..."  
Recommended: Chapter 3 of Machamer and Silberstein (reserve)

Class 5. (April 9): Contra-Positivism  
Read Scriven (handout)  
Recommended: Chapter 2 of Ladyman (reserve)

Class 6. (April 11): Falsifiability  
Read Popper "The Logic of Scientific Discovery", sections A and B

Class 7. (April 14): Falsifiability  
Read Popper "The Logic of Scientific Discovery", sections A and B  
Recommended: Chapter 3 of Ladyman (reserve)

Class 8. (April 16): CLASS DISCUSSION

Kuhn, Realism and Anti-Realism - (click here for study questions)

Class 9. (April 18): Conceptual Paradigms  
Read Kuhn "Scientific Revolutions"  
Recommended: Chapter 4 of Ladyman (reserve)

Class 10. (April 21): Conceptual Paradigms  
Read Kuhn "Scientific Revolutions"

Class 11. (April 23): Conceptual Paradigms  
Read Kuhn "Scientific Revolutions"

Class 12. (April 25): Anti-Realism  
Read Van Fraassen, “To Save the Phenomena”

Class 13. (April 28): Anti-Realism  
Read Van Fraassen, “To Save the Phenomena”  
Recommended: Chapter 5 of Ladyman (reserve)

Class 14. (April 30): Realism  

Class 15. (May 2): Realism  

Class 16. (May 5): Against Theory  
Read Hacking “Experimentation and Scientific Realism”

First Paper Due May 5 - click here for topics
Class 17. (May 7): CLASS DISCUSSION

Class 18. (May 9): PHYSICS PRESENTATIONS (click here for topics)

Reductionism and Anti-Reductionism - (click here for study questions)

Class 19. (May 12): Reductionism and the “Unity of the Sciences”
Read Carnap “Logical Foundations of the Unity of Science”
Recommended: Chapter 5 of Machamer and Silberstein (reserve)

Class 20. (May 14): Reductionism and the “Unity of the Sciences”
Read Carnap “Logical Foundations of the Unity of Science”

Class 21. (May 16): CHEMISTRY PRESENTATIONS (click here topics)

Class 22. (May 19): Anti-Reductionism in Psychology
Read Fodor “Special Sciences”

Class 23. (May 21): Anti-Reductionism in Psychology
Read Fodor “Special Sciences”
Recommended: Chapter 13 of Machamer and Silberstein (reserve)

Class 24. (May 23): BIOLOGY PRESENTATIONS (click here for topics)

No class on May 26th (Memorial Day)

Class 25. (May 28): Anti-Reductionism in Biology
Read Kitcher “1953 and All That…”

Class 26. (May 30): Anti-Reductionism in Biology
Read Kitcher “1953 and All That…”

Class 27. (June 2): CLASS DISCUSSION

Class 28. (June 4): Make-up day for the Day of Gracious Living
(In other words, the DoGL will happen somewhere in the last few weeks and we’ll adjust.)

Class 29. (June 6): VARIOUS PRESENTATIONS (click here for topics)

Second Paper Due June 10 - click here for topics