Phil 104: Philosophy of science (topical survey)

John Dougherty Fall 2017

Class:	MW 1:15–2:30, PR 202
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Office Hours:	MW 3:00–4:30, PR 209

Course description

This course is an introduction to the philosophy of science focused on central questions in the field. In the first part of the course we'll address three big questions: what is a scientific theory, what is the scientific method (is there one?), and how should we determine which theories are better than others? In the second part of the course we'll look at more specific questions, chosen based on the interests of course participants. These might include some of the following:

- Is there a difference between science and non-science?
- Do unobservables like electrons or genes exist?
- What counts as a good explanation in science?
- Are there laws of nature? What are they like?
- Is science unified and hierarchical?
- What roles do values play in science?
- How do gender and race affect science?
- What role should science play in the courtroom?

We'll approach these questions from two directions. First, we'll read some classic texts in the philosophy of science that offer answers to these questions and argue for them. After we understand the options, we'll look at specific case studies from science to test how well the philosophical theories apply to the actual workings of science.

Materials

The textbook for this course is *Exploring the Scientific Method: Cases and Questions*, by Steven Gimbel. It contains all of the readings and assignments for the first part of the course, so it's required. It can be purchased at the bookstore, and an e-book version is available for purchase online. Other readings will be posted to the Sakai site.

Accessibility

Pomona College is committed to making all courses accessible for everyone. If you need academic accommodations, please contact the Dean of Students office and visit the accommodation services page for more information about how the accommodation process works. I encourage you to come talk to me about your accommodations. As a Pomona faculty member, I am dedicated to supporting all students in my courses and making this course accessible for everyone.

Evaluation

The short-term goal of this course is for you to be able to state some of the major questions in philosophy of science, to explain some of the most popular proposed answers to these questions, and to use examples from scientific practice to argue for or against these proposals. The long-term goal is for you to develop your skills in posing good questions, generating possible answers, and identifying what counts as evidence in favor of each answer.

To achieve the first goal, we'll perform a number of written case studies. At the beginning of the course, you'll choose one of nine sciences. At the close of each of the first six topics, you'll will write a 750–500 word study evaluating the philosophical position on offer using a case from their chosen science. At the close of the course, you'll perform a more in-depth case study of 1500–2000 words. After each of these we will spend a day discussing some of your case studies in class. The smaller case studies will each be worth 10% of your grade, and the final case study will be worth 25% of your grade.

We'll work on the second goal in a few ways. As the course progresses, the written case studies will require more of you. For example, the sources relevant to the first case study are in the textbook; later case studies will require you to find the relevant sources on your own. The final case study will be entirely up to you: you get to choose the philosophical question and case from your science to apply. You'll turn in a 250–500 word description of your question and case before you write your final paper so I can give you advice about any changes or readings that might help improve your project. This proposal will be worth 5% of your grade.

Most of the class time will be spent discussing the readings. The goal of our discussion is to figure out the most important and the most confusing parts of the reading so that you can apply them to your cases. Talking about the questions philosophers ask and the arguments they give for their positions will help you figure out what makes for a good questions, answers, and evidence. We'll do some small assignments and in-class exercises to help improve these abilities and the discussion, and these will amount to 10% of your grade.

Late work policy

I will not accept late submissions. However, you have a "bank" of extension time consisting of four 12–hour units. You can extend the due date of any assignment submitted to Sakai by 12 hours up to four times. There are no penalties or bonuses for how you use this time, and you don't need to tell me ahead of time that you will be using it. You can only use this extension time on assignments submitted to Sakai, which will record your submission time so we can both keep track of what extension time you use. If you get sick or have an accident or other emergency, you should get in touch with me.

Academic integrity

We will all be committed to the standards of academic honesty in this course, especially those laid out in Pomona College's policies on Academic Standards.

Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
Aug 28th	29th	30th **1** Intro	31st	Sep 1st
4th **2** Deductivism	5th	6th **3** Deductivism	7th	8th

Monday	Tuesday	Wednesday	Thursday	Friday
11th **4** Deductivism	12th	13th **5** Deductivism case studies	14th	15th
18th **6** Inductivism	19th	20th **7** Inductivism	21st	22nd
25th **8** Inductivism case studies	26th	27th **9** Hypothetico-deductivism	28th	29th
Oct 2nd **10** Hypothetico-deductivism	3rd	4th **11** Paradoxes of Evidence	5th	6th
9th **12** Paradoxes of Evidence	10th	11th **13** Falsificationism	12th	13th
16th Fall recess	17th Fall recess	18th **14** Hypothetico-deductivism case studies	19th	20th
23rd **15** Holism	24th	25th **16** Holism	26th	27th

Monday	Tuesday	Wednesday	Thursday	Friday
30th **17** Holism case studies	31st	Nov 1st **18** Semantic view	2nd	3rd
6th **19** Semantic view	7th	8th **20** Semantic view	9th	10th
13th **21** Semantic view case studies	14th	15th **22** Critical views	16th	17th
20th **23** Critical views	21st	22nd **24** Critical views case studies	23rd Thanksgiving recess	24th Thanksgiving recess
27th **25** Topic A	28th	29th **26** Topic A	30th	Dec 1st
4th **27** Topic B Proposal due	5th	6th **28** Last day of class Topic B	7th Reading days	8th Reading days
11th Final exams	12th Final exams	13th Final exams	14th Final exams	15th Final exams