

**Phil 125: Final Assignment (Exam Version)**  
Fall, 2025

**Instructions**

Due, as an attachment, via the “Assignments” tool on Canvas, by 11:55pm Tuesday, December 9 (in PDF or any format easily converted to PDF, e.g. MSWord).

Answer any *two* of the questions listed below, in 2–3 pages for each answer, for a total of 4–6 pages.

The questions are keyed to different reading assignments, with the idea that each question is raised most centrally in a certain part of the reading. However, you can and should use material from anywhere in the text where it’s relevant to the answer.

Your focus should be on answering the questions accurately, not on making an original point or argument (if you want to do that, you should choose the paper option). However, all the questions do require some thought; they can’t simply be read out of the texts. And, of course, as usual, your answer must be “original” in the sense that it is your own work. (You are not required, and in fact not even encouraged, to use any outside source, but, if you do, you must cite it properly.)<sup>1</sup>

AI policy: I encourage the use of AI assistance with proper caution (i.e., keeping in mind that current AI is often wrong). You may use AI assistance basically in any way that would not constitute cheating if you used a human for the same thing. Similarly, you should cite the AI in cases where you would cite a human. If in doubt, feel free to ask me for clarification.

You can find answers to some commonly asked questions about my assignments and grading in my FAQ (<https://people.ucsc.edu/~abestone/courses/faq.html>).

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<sup>1</sup>If you have any questions about plagiarism and related issues, please see <https://guides.library.ucsc.edu/citesources>. To find out what happens if you are accused of plagiarism, see the academic misconduct policy: <https://ue.ucsc.edu/academic-misconduct.html>.

## Questions

1. Popper, *LSD*, ch. 1 and 2: It is clear that, in these chapters, Popper introduces three different questions: (1) the “problem of induction” (how can we come to believe universal statements on the basis of finite empirical data); (2) the “demarcation problem” (how can we distinguish science, properly speaking — empirical science — from others things that look like science but aren’t, such as pseudoscience, metaphysics, mathematics, etc.); and, finally, (3) certain questions about the relationship between science and the methodology of science, most importantly: is the *methodology* of science itself *science*? But it is not clear which of those three questions is most important to him. Choose one of the following three statements and explain how it could be right (that is, give the details of what Popper would be thinking as he connects one question to another in that way). (A) Popper’s *main* point is to show that (1), the “problem of induction,” doesn’t have a positive solution, and to explain how we can nevertheless learn something about universal laws. He discusses (2), the “demarcation problem,” because of that main point. (B) Popper’s *main* point is the role of falsifiability in answering the “demarcation problem,” (2). He discusses other methodological issues, (3), and the “problem of induction,” (1), because of that main point. (C) Popper’s *main* point is (3), the relationship between science and the methodology of science. He discusses the “problem of induction,” (1), and falsifiability as a response to the “demarcation problem,” (2), because of that main point.

2. Popper, *LSD*, ch. 3: Explain why Popper’s conception of a “theoretical system” (§16) might lead one to regard the axioms as “conventions.” That is: why do you come to regard the axioms as *defining* the terms they contain? (Hint: why will the axioms be the “most universal” statements? What kind of terms must the “most universal” statements contain? What is the problem about defining such terms?) Explain, further, why Popper wants to avoid that interpretation. How would someone who treats the axioms that way, as *conventions*, respond to new data coming in? Why would they never have to give up their theory?

3. Popper, *LSD*, ch. 4: Explain why, according to Popper, a theory cannot, in general, be falsified by a single accepted basic statement. Why must the falsification happen by means of an at least somewhat universal statement (a “falsifying hypothesis”)? (Hint: why is a “stray observation” not useful

to the scientific *community*?) Explain why, for the same reason, if we have a good scientific theory, there must always be more than one basic statement that the theory forbids?

4. Popper, *LSD*, ch. 5: What is “Fries’s Trilemma”? (Do not quote from the text to answer this; you must explain in your own words. What happens when we try to give a *reason* for believing every true statement?) How is Popper’s view on “basic statements” supposed to resolve this trilemma? How is this connected with his reason for rejecting all versions of “protocol sentences,” including even the version Carnap (in “On Protocol Sentences”) claims to have taken from Popper? That is: why, according to Popper, do all versions of “protocol sentences,” as opposed to Popper’s “basic statements,” leave the trilemma unresolved?

5. Popper, *LSD*, ch. 10: Explain why Popper’s view, as opposed to the view he describes as “inductivist,” makes it hard to understand why we *rely on* corroborated theories. That is: (1) Why would it be easy to see why we should rely on well-*justified* theories? (2) Why is it *hard* to understand why we should rely on Popper’s well-“corroborated” (severely tested) theories? And, (3) how would Popper respond to this objection? (So note, no part of this question is about saying why Popper rejects inductivism. Just take that for granted and explain why his rejection of inductivism creates this specific problem for him, and how he thinks he can deal with it.)

6. Neurath, Putnam, Lakatos: Choose one of the following examples and explain why (according to one or more of the three authors) it causes a problem for Popper: Newton’s derivation of Kepler’s laws; the discovery of Neptune; the orbit of Mercury. Why, according to the author(s) who raise the objection, does the example you have chosen seem to show that scientists theories are not *falsifiable* in the way he requires? How might Popper respond? What would he say his critic(s) have missed either about the example or about what his requirement of falsifiability actually entails?

7. Kuhn, *SSR*, ch. 1–5: On p. 34, Kuhn claims that three activities (“determination of significant fact, matching of facts with theory, and articulation of theory”) make up all the experimental and theoretical work of normal science. Choose one of these three activities and explain what it is like, using examples where helpful. Then explain why, according to Kuhn, someone could *not*, in general, be motivated to engage in this activity by a desire to

test theories, to uncover unexpected novelties, or to be useful. Why does engaging in the activity imply that you do not think current theories are false, and do not think anything unexpected will turn up in the results? And why, in general, is it clear that, in choosing to engage in this activity, we have not chosen to answer a question because we expect the answer to be useful (to society)? Explain, on the other hand, why, according to Kuhn, someone *could* be motivated to engage in this activity by a desire to solve “puzzles.”

8. Kuhn, *SSR*, ch. 6–8: Discuss either the discovery of oxygen or the discovery of X-rays, focusing on the role of “anomalies” and the ways in which the nature and role of such anomalies, according to Kuhn, are both like and unlike the nature and role of falsifying hypotheses as described by Popper. Explain further how the process in question is supposed to resemble the kind of “theoretical” crisis described in ch. 7.

9. Kuhn, *SSR*, ch. 9–10: How might a “positivist” (as described by Kuhn, beginning around p. 98) tell the story of Galileo’s discoveries about the behavior of pendulums? How would such a positivist argue that these discoveries were not incompatible with older theories? (See especially what Kuhn finally notes on p. 124: that Aristotelians didn’t discuss swinging stones at all.) Why is the positivist’s description wrong, according to Kuhn? Give at least two reasons. (Discuss what goes wrong in this particular case, but with reference to some of the supposed general facts about the “nature and necessity” of scientific revolutions — to quote the title of ch. 9 — which guarantee that all such stories will be wrong.)

10. Kuhn, *SSR*, ch. 11–13: On p. 149, Kuhn says: “The laymen who scoffed at Einstein’s general theory of relativity because space could not be ‘curved’ — it was not that sort of thing — were not simply wrong or mistaken.” This might be taken to mean that laymen are better placed to criticize new developments in science than we usually tend to think. Is that the moral Kuhn would want us to draw? Explain why or why not.