Philosophy of Science
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Official Course Description

An examination of selected topics in philosophy of science. Topics may include theories of explanation, confirmation, reduction, laws, the status of theoretical entities, and the epistemological foundations of scientific theories. This course may be taken more than once with department approval.

Role in Curriculum

This course is a Writing Instructive course, and it is part of the Science and Religion Thread.

Major Goals

1. **Healthy Skepticism**: Develop a healthy, curious skepticism toward science's outputs (and arguments about them).
2. **Significance Identification:** Learn to identify significant problems, processes, or successes in science and our understanding of it.
3. **Rhetorical Fluency:** Be able to persuasively argue for change (even radical change) by accurately forecasting, and accounting for, proposal reception.
4. **Philosophical Leadership:** Develop ability to "infect" others with your philosophical citizenship.

Reading Engagement

For each reading in this course, you will produce writing that demonstrates your engagement with its content. In the Overview unit, this will take the form of a reading response. In the Topics unit, you will write what I call a reverse-proposal, which will serve as practice for writing your own proposal. We will discuss the details, including a rubric, in class. The average of your grade on these will be used in calculating your final score.

Proposal Preparations

These assignments will be given as stepping stones on the way to your final proposal. These will be graded on completion. A note: when I say I will grade your preparation work for "completion," I mean that I will be doing something like mastery grading. Basically, if the assignment you turn in is good enough to go onto the next stage in the writing process, I will mark it "complete"; if it is not, I will mark it "incomplete." If you receive an "incomplete" mark on an assignment, you will need to either a) revise and resubmit it or b) submit another assignment of that type. (For example, if you submit an argument diagram for a paper you've read, call it Paper 1, you could either a) redo the argument diagram for Paper 1 or b) find another paper, call it Paper 2, and submit an argument diagram for it.) For each stage, I will be requiring you to have a certain number of assignments marked "complete" before you can move on to the next stage. (Since this is the first time I've taught any course this way, we will negotiate this number as we reach each stage.) This is to ensure both that you know what you're doing and that you're actually doing it.

All of your assignments will be turned in on Canvas. You will receive one of two grades for every scaffolding assignment: a "0" if it is incomplete and you need to try again, or a "1" if it is complete. You are in charge of keeping track what stage you are at in the writing process—after all, part of the goal of the course is for you to take control of your own learning!

Final Proposal

Your big project in this class will be persuading some group to use research from philosophy of science. You will do so in writing, and we will call the written product a proposal.

Proposals are an important form of writing, both in academia (e.g., for grants) and in industry (e.g., for project planning). However, the skills necessary for writing proposals are not often taught in school. Here we will develop some of these skills, using philosophy of science as a test bed.

For your proposal, you will identify work(s) in philosophy of science (roughly 75—100 pages) that you consider significant, and you will write a formal proposal that this work be considered or used by some group. The default "group" is me, in my capacity as an instructor of philosophy of science; however, I am happy to work with you to find another group that may work better for your long-term learning goals.

Your ultimate goal is to persuade this group to do something. As such, you will need to carefully consider *why* the work you've picked is significant, *who* your group is and *what* they (really) care about, and *how* this work should be used by them. For example, if you are writing a proposal to me, you need to consider what the goal of a philosophy of science course is, who such a course is for, and how the work you've chosen achieves these goals.

Your final proposal will be graded independently of the proposal preparation assignments, and it will be worth 40% of your final score. We will develop a rubric for the assignment in class. The rubric will consist in the identification of signs that you have achieved the course goals. For example, what signs should I look for in your proposal that demonstrate rhetorical fluency?

Final Integration

Instead of a final exam, our final meeting will be a whole-class discussion dedicated to integrating what we learned in class. In addition, we will discuss ways that the course worked well and ways that it could be improved. To conclude this latter discussion, you will be asked to complete the course evaluation if you have not already.

Grading

READING ENGAGEMENT	20%
CITIZENSHIP	20
PROPOSAL PREPARATIONS	15
FINAL PROPOSAL	40
FINAL INTEGRATION	5

Citizenship

The topics discussed by philosophers are often considered sensitive and personal, even in philosophy of science. This can make discussing them with others challenging. However, part of the goal of this course is to get better at communicating about these topics with others in a civil manner, instead of "agreeing to disagree" when things get tough. But note that being civil does not always mean exactly balanced: for example, if your opinion or its expression would exclude others for reasons out of their control, then *you*

are being uncivil. I will be calling someone who embodies this idea—being able to communicate about difficult topics in a civil manner—a *philosophical citizen* (literally, this means something like "subject of a society dedicated to the love of wisdom"). I expect you all to be a good philosophical citizen in this class.

In general, we will follow the rules below (adapted from Dr. Alison Reiheld's adaptation of Forni's *Choosing Civility*):

1. **Don't Interrupt.** If we are online at any point, this also means don't let your devices interrupt.
2. **Pay Attention and Listen.** *Paying attention* means considering the needs and expectations of others. For instance, consider: is now the right time for you to share your own view? *Listening* means both *hearing* what the other person is saying and *waiting* for them to say it. That means listening with the intention to understand the other person, but also avoiding guessing about what they are trying to say or why they are saying it. Aren't sure how someone wants to be heard? Ask! *Really* paying attention and listening to another person is hard work; if you don't feel exhausted when you're done, you may not be doing as good a job as you think.
3. **Speak Kindly and Don't Speak Ill.** Acknowledge that both what you say and how you say it have the power to hurt, and consider this before you speak. Also, don't speak ill of others, especially your classmates.
4. **Respect Others' Opinions**. Good people can disagree. Respecting others' opinions does not mean you have to give up your own. However, it does mean recognizing that others may look at the same world differently and that, in general, those different ways of looking at it deserve a fair hearing (in the appropriate setting).
5. **Accept and Give Constructive Criticism**. Philosophers disagree on just about everything. Nevertheless, they largely get along well with one another. This is in large part because they criticize each other *constructively*. Giving constructive criticism means identifying what someone has done well while providing specific feedback on what can be improved and why it is currently a problem. Accepting constructive criticism means listening (see above) to criticism and asking questions when you don't understand.
6. **Do the Reading and Be Prepared.** Philosophy classes are much more about *process* than they are about *content*. As such, most of your learning comes through spontaneous interactions in the classroom. If you are not actively preparing for your own learning before class, not only will you be unprepared for these interactions, you will reduce the quality of interactions your classmates can have *even if they've adequately prepared*. Tl;dr, do the readings and write out comments and questions in advance—don't be like Socrates's interlocutors.

In addition to being civil, I expect everyone to participate regularly and equitably in class and group discussions. This means being a regular contributor to discussions but avoiding dominating them. In addition, I expect you to help others ensure that they meet their participation obligations. For example, if someone else has not been participating in your group discussion, try to include them. You could ask them what they think, but you could even just tell them you want to help but aren't sure how.

Your citizenship grade will be assigned based on the following rubric. Your score will be assigned after each class meeting.

Score (out of 4)	Description
4—Exceeds Mastery	You're even managing to improve others' citizenship! Keep it up.

3.5—Meets Mastery	You were a good citizen.
3—Near Mastery	Overall, you were a good citizen, but some minor changes are appropriate going forward. See comments.
2—Below Mastery	You were a good citizen in some ways, but you need to make some significant changes going forward. See comments.
0—Nope	You either didn't show up, were asked to leave, or were obviously not engaged.

Unit Overview

Introductory Unit

During our first unit, we will familiarize ourselves with one another and the basics of the course. In the process, we will collaboratively develop some of the course policies, including:

- How citizenship grades are assigned (including failure to read) and problems adjudicated
- How late work will be handled
- Rubrics for reading responses and citizenship
- Policies for academic dishonesty
- What I report to CARE
- How to handle COVID-19 policy violations

We will also briefly discuss what philosophy of science is and what philosophers of science do.

Field Overview Unit

During our second unit, we will work through a popular introductory text for the field of philosophy of science. The book will give you a sense for what gets talked about in the field more broadly. This will be beneficial for two reasons. First, it will help us structure the rest of our class. During this field overview unit, we will be identifying further topics to explore in the last unit of our course—knowing more about the field in general will be helpful for this. Further, you will be able to draw on this overview in your proposal, whether that be through finding a topic you want to argue you for or even through finding a way to argue for that topic. Second, the overview will make it easier for you to talk to others outside of our class about philosophy of science. Like most disciplines these days, philosophy of science is becoming hyper-specialized; one way to maintain some connection across the discipline, and to make the discipline accessible to those outside it, is to get an overview from a popular source (that isn't *too* wrong about things or too old).

Topics Unit

During this final unit, we will dive into the topics we have chosen as a class. Assuming that the entire class is unable to decide on a single topic (or set of topics), we will likely be working through these topics in small groups. We will determine what this looks like when the time comes. Depending on how long the book/readings chosen for each topic are, we may be able to explore multiple topics by the end of the term.

In addition to exploring our topics, we will dedicate some of our classes during this unit to learning how to write proposals.

Tentative Schedule

Unit	Reading and Content	Reading Engagement	Writing	App. # weeks
Introduction	• Syllabus and rules • Introductions • Phil Sci overview sketch		• What do you want out of this class? Why?	1
Field Overview	Barker and Kitcher	Write reading response for each reading	• List of topic ideas • Narrow reading ideas • Select readings	4
Topics	• Topics TBD • How to write a proposal	Write reverse proposal for each reading (100-200 words)	• Benefits/drawbacks wrt course goals • Revised reading selections • Proposal first draft • Rewrite 1: ideas and rhetoric • Rewrite 2: structure and grammar • Rewrite 3: voice and nitpicking	11

Supplementary Resources

Philosophy of Science

- Stanford Encyclopedia of Philosophy
- Philpapers
- Philsci-archive.pitt.edu
- Philosophy of Science
- BJPS
- EJPS
- Crash Course
- Internet Encyclopedia of Philosophy
- Routledge, Cambridge, Oxford, etc., companions
- Philosophy Compass
- Notre Dame Review of Books
- Isis Book Reviews

Writing and Proposal Writing

- Dreyer's English
- *How to Fix Your Academic Writing*, Mewburn et al.