

# Philosophy of Science

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PH4201

Mon 12-2:30pm, AS4-0118, Spring 2026

Office hours: Mon 11am-12pm and by appt, AS3 05-04

## Course Description

Empirical science is an incredibly successful area of inquiry. In physics, biology, economics, and many other areas of science, we have learned a staggering amount about the world. In spite of this success—or perhaps, in part, because of it—science has been subjected to lots of criticism. Politicians, the humanities, the general public, and scientists themselves have criticized it: they have questioned scientific methods of inquiry, the objectivity of scientific investigation, the kind of knowledge achieved by various fields of science, and more.

In this course, students will explore philosophical questions concerning science and various criticisms of it. How, exactly, do scientific theories get confirmed? In what ways do facts about probability, and facts about typicality, figure in scientific reasoning? Is science objective? What justifies inductive reasoning as it is used in science? Do the entities posited by scientific theories actually exist? As we explore these general issues, we will touch upon issues that are specific to various sub-fields of science: we will explore philosophical questions relating to biology, feminist science, quantum mechanics, and more.

## Course Requirements

1. Participation (100 points).
  - Students are expected to ask questions, attend all lectures, and occasionally work together in small groups.
  - See the course website for the rubric which I use to grade participation.
2. Quizzes (10 points each; 10 quizzes total).
  - Due dates: from the first course meeting on, take a 5 minute reading comprehension quiz on the assigned article.
  - Your lowest quiz grade is replaced by a 10.
3. Final paper (100 points; 50 points for draft, 50 points for meeting).
  - Due dates: March 23 at 12pm; and April 6 at 11am-2:30pm.
  - Turn in a paper on a philosophy of science topic of your choice by 12pm on March 23.
  - Meet with me to answer questions about your paper on April 6.

For information about various course policies—for instance, the late assignment policy, the

grade appeals policy, and the make-up work policy—see the course websites.

1. Canvas course website: <https://canvas.nus.edu.sg/courses/88421>
2. My course website: [isaacwilhelm.com/teaching.htm](http://isaacwilhelm.com/teaching.htm)

## **Learning outcomes**

By this course's conclusion, you should be able to

- describe several key issues in the philosophy of science,
- construct arguments in support of your views,
- present views that differ from yours in a fair and charitable manner,
- write clearly, and
- discuss complex philosophical ideas respectfully.

## **Plagiarism and Academic Integrity**

Please adhere to the NUS policies on plagiarism and academic integrity. Penalties for violations of these policies can be severe: they include an automatic failing grade for the course, and possibly worse. A comprehensive overview of these policies can be found here:

<https://www.nus.edu.sg/cehc/programmes/plagiarism.html>

## **Accessibility**

This class should be a great, fun, and educational experience for everyone. And of course, everyone deserves equal access to all educational opportunities at NUS. Those with disabilities are encouraged to speak with me if that would be helpful, and to avail themselves of the services provided by the Disability Support Office

<https://nus.edu.sg/osa/student-services/student-accessibility-unit>

## **Schedule**

The readings are drawn from several sources: articles, websites, and selections from books. All readings are required. And all are posted on the course's Canvas website.

In the schedule below, I list the requirements for each week. The requirements include attending lectures, reading literature, taking short quizzes, and taking a final exam. Note that the readings, for any given week, should be completed before the lecture in that week.

Announcements about changes in the readings—if they occur—will be made in class, and only later added to the syllabus. You are responsible for knowing about those changes.

## **Jan 12: Introduction, and Confirmation**

### Readings

- “Two Dogmas of Empiricism” (Quine).
- “Logic and Arguments” (Wilhelm).

## **Jan 19: Confirmation**

### Readings

- “Studies in the Logic of Confirmation (I.)” (Hempel).

## **Jan 26: Objectivity and Subjectivity**

### Readings

- “Values and Objectivity” (Longino).

## **Feb 2: Objectivity and Subjectivity**

### Readings

- “Feminist Philosophy of Science: Values and Objectivity” (Crasnow).
- “Standpoint Epistemologies of Science,” pp. 131–148 (Potter).

## **Feb 9: Induction; Visiting Speaker, Professor Eugene Chua**

### Readings

- Machine Learning and the Ethics of Induction (Ratti).

## **Feb 16: Induction**

### Readings

- “Section IV: Sceptical Doubts concerning the Operation of the Understanding” (Hume).
- “The New Riddle of Induction,” pp. 59–66 (Goodman).

## **Mar 2: Induction**

### Readings

- “The New Riddle of Induction,” pp. 66–83 (Goodman).
- “Prospects for a Theory of Projection,” pp. 84–108 (Goodman).

## **Mar 9: Philosophy of Physics**

### Readings

- “Humean Supervenience” (Loewer).

## **Mar 16: Philosophy of Physics**

### Readings

- “A Modest Proposal Concerning Laws, Counterfactuals, and Explanations,” Chapter 1 (Maudlin).

## **Mar 23: Probability and Typicality**

### Readings

- “A Subjectivists’ Guide to Objective Chance” (Lewis).
- “Humean Supervenience Debugged” (Lewis).

### Assignment

- Turn in first draft of final paper by 12pm.

## **Mar 30: Probability and Typicality**

### Readings

- “Typical” (Wilhelm).
- “The Typical Principle” (Wilhelm).

## **April 6: Final Paper Discussions (no lecture)**

- Meet with me to discuss revisions to the first draft of your final paper.