Philosophy of Science

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PH4201
Mon 12-2:30pm, AS5 03-09, Spring 2024
Office hours: Monday 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.
    - Each student is required to attend office hours at least once. Email me if you are busy during my scheduled office hours, and we will find a different time to meet.
    - See the course website for the rubric which I use to grade participation.
2. Final paper, first draft (100 points).
    - Due date: March 20 at 11:59pm.
    - Must be in the range 2000-2500 words.
    - Closer to the due date, a detailed description of this assignment will be posted to the course website.
3. Final paper (100 points).
    - Due date: April 10 at 11:59pm.
    - Must be in the range 3000-3500 words.
    - Must be an expanded version of your midterm paper.
    - Closer to the due date, a detailed description of this assignment will be posted to

the course website.

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/55209
2. My course website: 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/celc/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: handouts, articles, and selections from books. All readings are required. They are all posted on the course's Canvas website.

In the schedule below, I list the requirements and readings for each week. For the requirements, I list the due dates. Bolded text indicates something which you will need to

submit for a grade, like a paper. Note that the readings, for any given week, should be completed before the lecture in that week.

This schedule is preliminary, and subject to change. Announcements about changes in the readings—whenever they occur—will be made in class, and only later added to the syllabus. You are responsible for knowing about those changes, if you miss class.

Week 1: Confirmation

Requirements

- Lecture: Jan 15.

Readings

- "Two Dogmas of Empiricism" (Quine).

Week 2: Confirmation

Requirements

- Lecture: Jan 22.

Readings

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

Week 3: Objectivity and Subjectivity

Requirements

- Lecture: Jan 29.

Readings

- "Values and Objectivity" (Longino).

Week 4: Objectivity and Subjectivity

Requirements

- Lecture: Feb 5.

Readings

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

Week 5: Induction

Requirements

- Lecture: Feb 19.

Readings

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

Week 6: Induction

Requirements

- Lecture: Mar 4.

Readings

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

Week 7: Philosophy of Physics

Requirements

- Lecture: Mar 11.
- **Final paper (first draft) due: Mar 11, 11:59pm.**

Readings

- "Humean Supervenience" (Loewer).

Week 8: Philosophy of Physics

Requirements

- Lecture: Mar 18.

Readings

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

Week 9: Probability and Typicality

Requirements
- Lecture: Mar 25.

Readings
- "A Subjectivists' Guide to Objective Chance" (Lewis).
- "Humean Supervenience Debugged" (Lewis).

Week 10: Probability and Typicality

Requirements
- Lecture: Apr 1.

Readings
- "Typical" (Wilhelm).
- "The Typical Principle" (Wilhelm).

Week 11: Philosophy of Biology

Requirements
- Lecture: April 8.

Readings
- "Feminism and Philosophy of Science," Introduction (Potter).

Week 12: Philosophy of Biology

Requirements
- Lecture: April 15.
- **Final paper (final draft) due: April 15, 11:59pm.**

Readings
- "Gender and the Biological Sciences" (Okruhlik).