# Philosophy of Science

## Course information

Phil\*2180, Fall 2023

Department of Philosophy, COA. University of Guelph

Tuesday /Thursday (in person) 11:30-12:50

Please consult Courselink for the classroom location.

## Instructor

Please see Web Advisor for instructor information.

Office hours : Tuesdays 10:30 - 11:20, or by appointment.

Office location: Mackinnon 358 (office wing of building, take elevator or stairs from 1st floor)

Email: [linquist@uoguelph.ca](mailto:linquist@uoguelph.ca)

## Calendar Description

As a system of knowledge pursuit, science develops laws and theories to explain, predict, understand, and control empirical phenomena. This course introduces students to many of the challenging assumptions, foundations, and implications of science. Topics include the nature of scientific knowledge, the structure of scientific theories, the distinction between science and pseudo-science, whether there is a scientific method, and how social and political processes influence the way science develops. 2.0 credits or one of PHIL\*1000, PHIOL 101, PHIL\*1050.

## Course Description

Over the past three centuries, science has gradually overtaken religion as the dominant source of knowledge about nature —including human nature. Yet there are lingering questions about the limits of scientific explanation and whether it deserves its place of authority in contemporary society. Before one can address those issues, it is important to understand how science has managed to attain its current level of success. You might answer, “because science makes successful predictions,” or, “because science leads to the production of fancy gadgets like my iPhone.” To be sure, these outcomes are part of the reason that science has replaced religion and other conceptual frameworks. But how does science manage to generate these impressive results? What is it about science, and scientific conduct, that distinguish it from other systems of belief? Over the past 100 years, philosophers have made considerable progress in answering this question. The aim of this course will be to review the philosophical theories and debates that have surrounded this field of research. The format of this course is organized around four very different types of answer to the question: “Why is science so successful?” Each answer corresponds roughly to a period in the recent (100 year) history of philosophy.

The first answer is that science is successful because it is grounded in experience. This is the answer that was defended by positivists and then empiricists. The first part of this course will critically assess their positions. A second answer, associated with Karl Popper, claims that science is successful because it follows the right method. We will consider this position in light of Thomas Khun’s criticisms. Alternatively, some argue that science isn’t really so successful after all – we have just been socially conditioned to believe that it is. We will examine this idea in the context of some popular postmodernist thinkers including Paul Feyerabend and Bruno Latour. The final proposal states that science is successful because it embraces the right sorts of social practices. This view will be evaluated in light of work by Phil Kitcher, Heather Douglas and some more recent social epistemologists.

## Learning outcomes

1. Be able to critically reflect, verbally and in writing, on the major developments in the philosophy of science over the past century.
2. Develop skills for evaluating the credibility of scientific claims presented to the public as authoritative.
3. Develop a nuanced understanding of how and why the institution of science has been relatively successful at acquiring knowledge.

## Grading

In order to succeed in meeting the learning outcomes and earning a good grade in this course, it is important that students attend class.

* *Quizzes* (Learning Outcomes 1,2,3). 50% of the final grade is distributed over five in-class quizzes. On those days, we will begin with a review discussion of the material, take the quiz, then grade it in class. If you must miss a quiz, a makeup quiz will be arranged as soon as possible.
* *Participation* (Learning Outcomes 1,2,3). Another 20% of the final grade is allocated to participation during class discussions. Students will meet in small groups, discuss assigned topics, then engage in a broader class discussion.
* *Final Exam* (Learning Outcomes 1,2,3). The remaining 30% is allocated to a cumulative final exam.

## Readings

Please purchase a physical copy of Peter Godfrey-Smith’s Theory and Reality (2nd edition), available in the bookstore. It is the primary text for this course and we will be referring to it in class. Additional readings will be made available electronically on Courselink.

## Schedule

### Week 1

Th 08/07 - Why care about the philosophy of science?

### Week 2

Read: Theory and Reality, Ch 1 (p. 2-25)

T 09/12 - Class discussion: “Measures for preventing the spread of COVID 19, were they

scientifically justified?”

TH 09/14 - Class discussion: “Is it reasonable to believe that intelligent alien life has visited

earth?”

### Week 3

Read: Theory and Reality, Ch.2 (p. 27-52)

T 09/19 - Lecture: Basic introduction to Empiricist philosophy.

Th 09/21 - In class Quiz on Empiricism (material from Ch.2).

### Week 4

Read: Theory and Reality, Ch. 3 (p. 54 – 76)

T 09/26- Lecture: The problems of induction.

Th 09/28: In class discussion: Is induction really such a problem?

### Week 5

Read: Theory and Reality Ch. 4. (p. 78-100)

T 10/03 – Lecture on Popper and the so called Scientific Method

Th 10/05 – In class Quiz on Induction and Scientific Method (material from Ch.’s 3 & 4)

### Week 6

Read: Theory and Reality, Ch. 5 (p. 102 – 130).

T 10/10 – Fall Break, no class

Th 10/12 - Lecture on paradigm shifts and revolutionary science.

### Week 7

Read: Theory and Reality, Ch 6 (p. 132-150)

T 10/17 – Class discussion: What is a scientific paradigm and what are the implications for

empiricism?

Th 10/19 – In class quiz on paradigms and frameworks (material from Ch.’s 5 & 6).

### Week 8

Read: Theory and Reality, Ch 7 (p. 152 – 171).

T 10/24 – Lecture on the “science wars” and sociological critiques of science.

Th 10/26 – Lecture on the social structure of science.

### Week 9

Read: Theory and Reality, Ch. 8 (p. 172 – 195)

T 10/31 – Lecture on the political dimension of science/

Th 11/02 In class quiz on social dimensions of science (material from Ch.’s 7 & 8)

### Week 10

Read :Theory and Reality, Ch. 9 (p. 197-220).

T 11/07 – Lecture on Naturalistic Philosophy

Th 11/09 – In class discussion of Science as an evolutionary process.

### Week 11

Read: Theory and Reality, Ch 11. (247 – 265),

T 11/14 – Lecture on Scientific Laws

Th 11/16 In class quiz on naturalism and laws (material from Ch.’s 9 & 11).

### Week 12

Read: Article “Scientific and lay communities: earning epistemic trust through knowledge sharing. Synthese (2010) 177:387-409.

T 11/21 – Lecture on scientific trust within marginalized communities

Th 16/11 – Class discussion of how to be a responsible consumer of science.

### Week 13

Read: article “Trust, expertise, and the philosophy of science.” Synthese (2010) 177: 411-425.

T 11/28 – Lecture on public (mis) trust in science

Th 11/30 – Review for final exam.

## Final exam

12/14 – Location TBD, 8:30 am- 10:30 am.

## College or Arts statements

Please follow [this link](https://www.uoguelph.ca/arts/system/files/CO%20Standard%20Statements.pdf) for information about plagiarism, course drop deadlines, and other important administrative matters.