



PHIL*2180 Philosophy of Science

Fall 2019

Section(s): C01

Department of Philosophy

Credit Weight: 0.50

Version 2.00 - September 06, 2019

1 Course Details

1.1 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.

Pre-Requisites: 2.00 credits or (1 of PHIL*1000, PHIL*1010, PHIL*1050)

1.2 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.

Grades will be based on weekly reflection assignments (60%), a final essay (25%), and participation in class discussion (15%).

1.3 Timetable

Monday and Wednesday 2:30-3:50

1.4 Final Exam

There is no final exam per se. The final essay will be due during exam period. Due date TBA.

2 Instructional Support

2.1 Instructional Support Team

Instructor:	Stefan Linqvist
Email:	linquist@uoguelph.ca
Telephone:	+1-519-824-4120 x56672
Office:	MCKN 358
Office Hours:	Wednesday 4-5 pm or by appointment.

3 Learning Resources

3.1 Required Resources

Theory and Reality (Textbook)

Godfrey-Smith P. (2003), *Theory and Reality: An Introduction to the Philosophy of Science*. U of Chicago Press,

Paradox of feminist primatology (Article)

<http://people.ucalgary.ca/~fedigan/Fedigan%202001.pdf>

Fedigan, LM. (2001) The paradox of feminist primatology - the Goddess's Discipline? In: *Feminism in Twentieth Century Science, Medicine and Technology*. A Creager, E Lunbeck and L Schiebinger (eds) University of Chicago Press, pp. 46-72

The Guru Effect (Article)

http://www.dan.sperber.fr/wp-content/uploads/2010_the-guru-effect.pdf

Sperber, D. (2010), The guru effect. *Review of Philosophy and Psychology*. 1: 583-592.

Logical Analysis of Psychology (Article)

Hempel, C. (2010) The logical analysis of psychology. In Ned Block (ed.), *Readings in Philosophy of Psychology*. Cambridge: Harvard University Press. pp. 1–14.

Rival theories of smoking (Article)

<https://www.princeton.edu/~tleonard/papers/underdetermination.pdf>

Goldfarb, T.C.L & Suranovic, S.M. (2001), Are rival theories of smoking under-determined? *Journal of Economic Methodology*, 8:229-251.

Astrology a pseudoscience (Article)

<https://www.uio.no/studier/emner/matnat/ifi/MNSES9100/v16/pensumliste/environmental-ethics/thagard-astrology.pdf>

Thagard, P.F. (1978) Why astrology is a pseudoscience. *Proceedings of the Philosophy of Science Association*.

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. 1. Understand, explain and assess major historical and/or conceptual developments in the philosophy of science and their application to concrete issues.
2. Identify and critically evaluate the practical significance of central issues in the philosophy of science.
3. Read and comprehend original source materials in the history and problems of philosophy.
4. Write clearly and cogently on basic problems in philosophy.

5 Teaching and Learning Activities

5.1 Lecture

Week 1

Topics:

The empiricist approach to science.

Monday: Setting class objectives and short lecture on Theory & Reality, Chapter 1.

Wednesday: Lecture on Logical Empiricism.

Submit short reflection on Theory and Reality Ch 2, "Logic Plus Empiricism" (p. 19-37) **Due Friday Sept 13..**

Week 2

Topics: **The problem of induction and other challenges to logical positivism.**

Monday: class Discussion of Ch 2 and short lecture on the problem of induction.

Wednesday: More on the problem of induction.

Submit short reflection on Ch 3 Theory and Reality, "Induction and Confirmation" (p. 39-56) **Due Fri. September 20.**

Week 3

Topics: **Applying positivist thinking to psychology.**

Monday: Discussion of Ch 3 and short lecture on Hempel's The Logical Analysis of Psychology."

Wednesday: Lecture on Hempel's The Logical Analysis of Psychology."

Reflection questions on "The Logical Analysis of Psychology." **Due Friday September 27.**

Week 4

Topics: **Popper, falsifiability, and the scientific method**

Monday: lecture on the demarcation and falsifiability.

Wednesday: lecture on the scientific method.

Submit short reflection on Theory & reality Ch 4: Popper, conjecture and refutation. **Due Friday Oct 4.**

Week 5

Topics:

Paradigm shifts, Thomas Kuhn, and the challenge to objectivity.

Monday: Discussion of Popper reflection and short lecture on Kuhn and Normal Science.

Wednesday: Lecture on Kuhn and Scientific Revolutions

Short reflection on Theory & Reality, Chapter 5 "Kuhn and Normal Science" (p.75-86) and Chapter 6, "Kuhn and Revolutions" (p. 87-101) **Due Friday Oct, 11.**

Week 6

Topics:

Wednesday: discussion of Kuhn and his legacy (Chapters 5 & 6.)

Week 7

Topics:

Philosophy of science after Kuhn.

Monday: lecture on Lakatos, Laudan and the search for good science.

Wednesday: Lecture on Feyerabend (anything goes).

Submit reflection on Theory and Reality Ch. 7 Lakatos and Feyerabend. **Due Fri. Oct. 25.**

Week 8

Topics: **Philosophy of science after Kuhn II.**

Monday: discussion of Ch. 7 Lakatos and Feyerabend.

Wednesday: lecture on Thagard "Why astrology is a pseudo science."

Submit reflection on "Why astrology is a pseudo science" **Due Fri. Nov 1.**

Week 9

Topics: **The sociology of science**

Monday: Leviathan and the Airpump and other challenges from sociology.

Wednesday: lecture on the Sokal hoax and its aftermath.

Submit reflection on Theory & reality Ch 8, "The challenge from sociology." **Due Friday Nov 8.**

Week 10

Topics: **Feminist philosophy of science**

Monday: lecture on varieties of feminist philosophy

Wednesday: lecture on feminist primatology.

Submit reflection on Fedigan, "The paradox of feminist primatology." **Due Friday Nov 15.**

Week 11

Topics: **Naturalistic Philosophy of Science**

Monday: Discuss "paradox of feminist primatology" reflection.

Wednesday: Lecture on the social structure of science

Submit reflection on Theory & reality Ch 10 "Naturalistic Philosophy" (149-163). **Due Nov 22.**

Week 12

Topics:

Naturalism and the Social Structure of Science

Monday: Discuss assignment on Naturalistic Philosophy

Wednesday: Lecture on the social structure of science.

Submit reflection on Theory & Reality Ch 11, "Naturalism and Social Structure(163-172). **Due Nov 29.**

6 Assessments

6.1 Assessment Details

Weekly reflections (60%)

Date: Weekly reflections

There are twelve reflection assignments, some will be longer and more structured than others. Depending on the length they are worth 5-10% each. Students have the option of dropping the two lowest assignments. They are worth 60% of the final grade.

class participation (15%)

Date: all semester

Students are expected to attend all lectures and to participate in structured class discussions. This component of your performance is worth 15% of the final grade.

Final Essay (25%)

Date: exam period

Early in the exam period students will submit a final essay worth 25% of your grade.

7 University Statements

7.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

7.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

7.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

7.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

7.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website
<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website
<https://www.ridgetownc.com/services/accessibilityservices.cfm>

7.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community—faculty, staff, and students—to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

7.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

7.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>
