

Philosophy of Science 1 (PHIL08005)

20/21

Semester 1

This course introduces students to major topics in philosophy of science, aiming to address the central question: "What makes science special?"

Course Organiser / Lecturer:

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Lecturer:

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Lectures available online

Monday 9:00 am

Tuesday 9:00 am

Thursday 9:00 am

Lecture Topics and Readings

Week 1: Historical Background

Recommended Reading:

Descartes, Rene (1998) "Rules for the Direction of our Native Intelligence" in *Selected Philosophical Writings*, ed. and trans. John Cottingham and Robert Stoothoff, pp. 1–19

Bacon, Francis (2000) *The New Organon*, ed. Lisa Jardine and Michael Silverthorne, Cambridge UP. Bk 1, Aphorisms I–X, XVIII–XXIV, XXXVIII–XLVI, L, CV–CVI. In this edition, pp. 33, 34, 36, 37, 40–43, 45, 83, 84.

Week 2: The Problem of Induction

Essential Reading:

Bortolotti, Lisa (2008) *An Introduction to the Philosophy of Science*, Chapter 2
“Reasoning,” pp 30–52.

Recommended Reading:

Hume, David (1739 / 1888) *Treatise of Human Nature* (ed. Selby-Biggs) Book 1, part 3, sec. 6.

Week 3: Logical Empiricism

Essential Readings:

Godfrey-Smith, Peter (2003) *Theory and Reality*, Chapter 2: “Logic plus empiricism,” pp. 19–38.

Hempel, Carl (1962) “Two Basic Types of Scientific Explanation” in (Curd & Cover, eds.) *Philosophy of Science: The Central Issues*, pp. 685–719.

Recommended Reading:

Stanford Encyclopedia Article: <https://plato.stanford.edu/entries/logical-empiricism/>

Week 4: Kuhn: Revolutions and Progress

Essential Reading

Kuhn, Thomas S. (1970) *The Structure of Scientific Revolutions*, 2nd ed. Chapter 1: “A Role for History” pp. 1–9.

Kuhn, Thomas S. (1977) “Objectivity, Value Judgment, and Theory Choice,” in *The Essential Tension*, pp. 320–339.

Recommended Reading

Kuhn, Thomas S. (1970) *The Structure of Scientific Revolutions*, 2nd ed. Chapter 9
“The Nature and Necessity of Scientific Revolutions,” pp. 92–110.

Ladyman, James (2002) *Understanding Philosophy of Science*, Chapter 3
“Falsificationism,” pp 62–92.

Popper, K. R. (1959) *The Logic of Scientific Discovery*, Ch. 1, “A Survey of Some Fundamental Problems,” Routledge, pp 3–26.

Week 5: Values in Science

Essential Reading:

Longino, Helen (1995) “Gender, Politics, and the Theoretical Virtues,” *Synthese* 104: 383–397.

Kourany, Janet A. (2003) “A Philosophy of Science for the Twenty-First Century” *Philosophy of Science* 70(1): 1–14.

Week 6: Realism

Essential Reading:

Hilary Putnam (1978) "What is realism?" in *Meaning and the Moral Sciences* (London: Routledge). Up until start of "Mathematical Intuitionism" section ONLY

Bas van Fraassen "Arguments concerning scientific realism," ch. 2 of *The Scientific Image* (1980), Clarendon Press. Reprinted in Curd and Cover, pp. 1064-1087.

Recommended reading

Feyerabend, Paul (1975) "How to Defend Society Against Science," *Radical Philosophy* 11: 3–8.

Ian Hacking "Experimentation and scientific realism," *Philosophical Topics* 13 (1982), pp. 154-72. Reprinted in Curd and Cover, pp. 1153-1168.

Ladyman, J., 1998. "What is structural realism?" *Studies in History and Philosophy of Science*, 29: 409–424.

Week 7: Models

Essential Reading:

Weisberg, Michael (2007) "Who is a Modeler?" *British Journal for the Philosophy of Science* 58(2): 207–233.

Angela Potochnik (2012). "Feminist Implications of Model-Based Science." *Studies in History and Philosophy of Science Part A* 43 (2):383-389.

Recommended Reading:

Morrison, Margaret and Mary S. Morgan (1999) "Models as Mediating Instruments," Ch. 2 of *Models as Mediators*, ed. Morrison and Morgan. Cambridge UP, 10–37.

Darden, Lindley, R. P. Lipika, Kunal Kundu and John Moulton (2018) "The Product Guides the Process: Discovering Disease Mechanisms" in Dank and Ippoliti (eds.) *Building Theories*. Springer, 101–117.

Darden, Lindley and Carl Craver (2002) "Strategies in the Interfield Discovery of the Mechanism of Protein Synthesis" *Studies in the History and Philosophy of Biological and Biomedical Sciences* 33: 1–28.

Week 8: Laws & Causation

Essential reading

Bird, Alexander (1998) *Philosophy of Science*, Chapter 1: "Laws of nature"

Beebe, Helen (2000) "The non-governing conception of laws," *Philosophical and Phenomenological Research* 61 (3):571-594.

Recommended reading

Cartwright, Nancy (1979) "Causal laws and effective strategies," *Noûs* 13 (4): 419-437.

Hall, Ned (2004) "Two concepts of causation" In John Collins, Ned Hall & Laurie Paul (eds.), *Causation and Counterfactuals*. MIT Press. pp. 225-276

Week 9: Explanation & Understanding

Essential Reading

Machamer, Darden, and Craver (2000) "Thinking about Mechanisms," *Philosophy of Science* 67: 1–25.

Regt, H.W.de, (2017) "Understanding and the aims of science," ch. 2 of *Understanding scientific understanding*, New York, NY: Oxford University Press.

Recommended reading

Potochnik, A. (2018) "Causal Pattern Explanation" ch. 5 of *Idealization and the aims of science*, Chicago: The University of Chicago Press.

Further reading

Cartwright, Nancy (2004) "From Causation to Explanation and Back," in Leiter B, ed. *The Future for Philosophy*. OUP, pp. 230–45.

Week 10: Reduction & Emergence

Essential reading

Epstein, B., (2015) *The ant trap : rebuilding the foundations of the social sciences*. New York: Oxford University Press. (Chapters 1 & 2; pp. 13-35)

Recommended reading

Oppenheim, Paul; Putnam, Hilary. (1958). "Unity of science as a working hypothesis," University of Minnesota Press, Minneapolis. Retrieved from the University of Minnesota Digital Conservancy, <http://hdl.handle.net/11299/184622>.

Further Reading

Nagel, Ernest (1970) "Issues in the Logic of Reductive Explanations" in (2008) *Emergence: Contemporary Readings in Philosophy and Science*, ed. Bedau and Humphreys

Kaiser, Marie I. (2012) "Why it is Time to Move Beyond Nagelian Reduction," in *Probability, Laws, and Structures*, ed. Dieks, Gonzalez, Hartmann, Stöltzner, and Weber. pp. 245–262.

Week 11: Review

Lecture notes and other materials will be available on [Learn](#).

Further advice on Readings

Encyclopaedias are a very good source of extra reading. Avoid Wikipedia (it is often inaccurate on philosophy) but there are good internet encyclopaedias that can be useful:

[The Stanford Encyclopedia of Philosophy](#) (SEP)

[The Internet Encyclopedia of Philosophy](#) (IEP)

Websites

We also recommend the following as starting points for your research:

[PhilPapers](#)

[Philosophy Compass](#)

[The Diversity Reading List](#)

You will need to know how to track down sources, including electronic journals, using the library search engine [DiscoverED](#).

Tutorials

In addition to three course lectures per week, you will have weekly tutorials. These give you a chance to further discuss topics and issues in the course and its lectures. Tutorials will take place, at times and places to be arranged, during weeks 2 through 11 of the semester.

Attendance at tutorials is compulsory for all students on this course. The class tutor will maintain a register of attendance. Unexplained absences will be brought to the attention of your Personal Tutor.

You will be allocated a suitable tutorial group by the Timetabling Department based on your timetable. Should you wish to change the group you have been allocated to, you will need to fill in the *Group Change Request Form* on the Timetabling Department's webpage. This form will be open until the end of Week 3 – if you wish to change groups after this time please contact the Teaching Office directly (philinfo@ed.ac.uk).

Please inform your tutor and the Teaching Office of any absences. Students who miss tutorials may be required to do additional written work.

Assessment

The course assessment is broken down into three components:

Participation (5%)

Midterm essay, 1500 words (25%)

End of semester Final Assignment (70%)

Participation

Class participation is assessed through short quizzes following each lecture. These quizzes are designed to assess attention during the lecture video and to reinforce the lecture material. It is recommended to take each quiz immediately after you finish watching the lecture videos. Feel free to consult the lecture slides that are available in pdf as you take the quiz. **Deadlines:** You have 2 weeks from the initial lecture posting to take each quiz.

Mid-term essay

The deadline for the midterm essay is by **12pm (mid-day), Wednesday 28th October.**

You should submit your essay via Turnitin on the Learn page. Please contact the Course Secretary if you are having problems uploading your essay.

The word count of your essay, including footnotes but excluding bibliography, must not exceed the specified word limit of 1500 words. The precise word count must be written on the coversheet. Overlong essays will be penalised according to the following rule: 1% of the maximum obtainable mark will be deducted for every 100 words, or part thereof, over the word limit. So, exceeding the word limit by 1-100 words incurs a deduction of 1%; exceeding by 101-200 words incurs a deduction of 2%; and so on.

End of semester test

There will be a comprehensive final assignment at the end of the semester, due by **12pm (mid-day), Thursday 17th December.** Exact details of the format and release date of the final assignment will be released later in the semester.

Resit

The resit for this course is a final assignment worth 100%. This will take place in the April/May exam diet. Students will be informed of the exact dates closer to the time.

Visiting undergraduates

The assessment arrangements for visiting undergraduates are the same as for other students.

Mark Schemes

For Philosophy-specific marking guidelines go here:

[Grade-related marking guidelines for Philosophy](#)

For the University's general marking scheme go here:

[Common Marking Scheme](#)

Learning Resources

Learn

You should regularly check your university email and check for announcements on the course *Learn* page.

The course *Learn* page will provide information concerning:

- General information and announcement about the course
- Lecture notes and slides
- Tutorial arrangements
- Information about assessment arrangements

University of Edinburgh Library

The library's hard-copy and online resources can be searched online via *DiscoverEd*.

Exemplar essays

Anonymised exemplar essays will be on the Learn pages. These are essays written by past students that they have kindly agreed for us to use. We encourage you to read these essays in conjunction with the Philosophy-specific marking guidelines. In doing so think about the strengths and weaknesses of the essay, why the essays fell into their grade-band, and how they could have been improved.

There are many ways for an essay to fall into a particular grade-band. The Philosophy-specific marking guidelines provide explanation of the many, diverse, ways in which an essay can be a 1st, 2.i, 2.ii, and so on. The exemplar essays only show one way to achieve a certain grade; it is not the only way.

Autonomous Learning Groups

Each course has dedicated Autonomous Learning Groups. It is up to you, the members of the ALG, to organise the meetings. You decide how often to meet and what to do in your ALG. ALGs are designed to help you learn and get to know your classmates; they are not a formal requirement of the course. It is important to note that assessment in your courses is non-competitive: you aren't competing against your classmates, only against the general grade criteria. It is in your interests to help each other.

You could use ALG meetings to:

- Read and discuss the papers together
- Discuss essay-writing and time-management techniques
- Constructively critique draft essays or plans
- Work on presentations or discussion posts that the class may involve
- Share tips on career advice

Please email the Course Organiser if you feel that it would be useful for the group if they joined one of your sessions. Please contact the course secretary if you find it necessary during the semester to transfer into a different group.

Getting in Touch

If you have a question regarding lecture content you should ask it in your tutorial group and/or visit the relevant lecturer to discuss it during their office hour.

For other specifically academic matters, you can contact the Course Organiser.

If you have questions not specifically about lecture content, you should contact the Course Secretary.

Prizes

Students who excel in Philosophy of Science may be eligible for the Daniel Garrad Prize.

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