



HPSC0004 Philosophy of Science 1 Syllabus 2023/24

Course Description

This is an introductory module in the philosophy of science. The course is divided into two parts: (1) the epistemology of science and (2) the metaphysical issues in the sciences. The first part of the course will focus on several central problems regarding the nature of scientific knowledge: how do scientists know if current scientific theories are true? Is science progressive? How do scientists test their theories and how are theories confirmed? Can science and pseudoscience be distinguished? How are sciences distinguished from one another? These questions will be discussed in the light of examples from science. The second part will focus on the realism/anti-realism debate, the status of scientific theories, the laws of nature and causation. Towards the end of the course we will also consider some of the overlap between social and ethical issues and the sciences. During the course of discussing these problems, you will study some of the major positions that have been taken about scientific knowledge both in the history of philosophy and in the 20th century: Inductivism (Bacon), Logical Empiricism (Ayer and Quine), Falsificationism (Popper), Incommensurability (Kuhn) and Relativism (Feyerabend). Philosophy of Science 1 will provide you with the background knowledge that you will need for other Philosophy courses that you will take in later years. You do not need prior knowledge of philosophy or science to do this course.

Moodle Page	Search HPSC0004
Assessment	Assessment 1: 2000-word essay (50%) Assessment 2: In person, unseen exam (50%)
Prerequisites	None
Timetable	See UCL Timetable
Lecturer	Dr Rory Jubber and Prof. Emma Tobin
Lecturer Contact	rory.jubber@ucl.ac.uk and e.tobin@ucl.ac.uk
Office Location	(Rory) Room 1.1, 22 Gordon Square (Emma) Room 2.4, 22 Gordon Square
Office Hours	Please email the lecturers in advance to secure a meeting during office hours. (Rory) Tuesdays 15:00-16:00 and Wednesdays 15:00-16:00

Schedule

UCL Week	Topic	Activity
20	(1) Scientific Knowledge Lecture 1: Introduction to the philosophy of science Lecture 2: Knowledge, Induction and Verificationism	1. Complete all lecture and seminar reading. 2. Attend onsite lectures and seminar.
21	(2) Falsificationism Lecture 3: Popper and Falsificationism Lecture 4: Underdetermination and Experiment	1. Complete all lecture and seminar reading. 2. Attend onsite lectures and seminar.
22	(3) Historicism Lecture 5: Kuhn, Revolution and Normal Science Lecture 6: Incommensurability and Relativism	1. Complete all lecture and seminar reading 2. Attend onsite lectures and seminar.
23	(4) Realism and Anti-Realism Lecture 7: Realism and the No- Miracles Argument Lecture 8: Anti-Realism and the Pessimistic Meta-Induction	1. Complete all lecture and seminar reading. 2. Attend onsite lectures and seminar.
24	(5) Turns in the Realism Debate Lecture 9: Constructive Empiricism Lecture 10: Entity and Natural Kind Realism	1. Complete all lecture and seminar reading. 2. Attend onsite lectures and seminar.
25	(6) Reading Week	
26	(7) The Pragmatic Turn Lecture 11: Idealisation and Models in Science Lecture 12: Case Studies in the Philosophy of Science	1. Complete all lecture and seminar reading. 2. Attend onsite lectures and seminar.
27	(8) Values and Science Lecture 13: Values, Science and Objectivity Lecture 14: Feminist Approaches in the Philosophy of Science	1. Complete all lecture and seminar reading. 2. Attend onsite lectures and seminar.
28	(9) Philosophy of Technology Lecture 15: Technoscience Lecture 16: Artificial Intelligence	1. Complete all lecture and seminar reading. 2. Attend onsite lectures and seminar.
29	(10) Essay Workshop Lecture 17: How to write a philosophy essay. Lecture 18: Essay Clinic	1. Complete reading on how to write a philosophy essay. 2. Attend onsite lectures on essays and seminar.
30	(11) Explanation, understanding and looking forward. Lecture 19: Science, Explanation and Understanding Lecture 20: Conclusion and looking forward	1. Complete all lecture and seminar reading. 2. Attend onsite lectures and seminar.

Assessment

	Description	Deadline	Word limit	AI Engagement Category
Assignment 1 (50% of credit)	Essay	25/03/2024	2000	Category 2 (please review the relevant section on page 4 of this syllabus)
Assignment 2 (50% of credit)	2 hour in person, unseen exam	Date of exam will be released later in the year.	N/A	Category 1 (please review the relevant section on page 4 of this syllabus)

Assignments

- Assignments will take the form of an a 2000-word essay on a set question and a 2-hour in person unseen exam.
- Each assignment will constitute 50% of the credit for the module.
- Essay questions and instructions will be distributed within the first three weeks of teaching.
- Lecture time will be designated to assisting students with writing philosophical essays.
- The unseen exam will mirror the taught content, with each question based on a weekly topic.
- The unseen exam will be two hours in length, with students needing to answer three questions.
- There will be an exam preparation session in the early part of term 3 to assist students in their preparation for the exam.

The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook. Details of college and departmental policies relating to modules and assessments can be found in the STS Student Handbook www.ucl.ac.uk/sts/handbook All students taking modules in the STS department are expected to read these policies. Course-specific guidance to be presented and discussed in class

Teaching Format

- Lectures and seminars will be delivered onsite at UCL. In person attendance is mandatory.
- There will be two lectures per week, timetabled in succession on the same day.
- Lectures will occur each week prior to seminars.
- Seminar groups will be allocated.
- Seminars will be led by a postgraduate teaching assistant, usually a PhD candidate. Attendance at seminar is mandatory.
- Seminars will be composed of more discursive activities based on the weekly seminar readings.
- Please see the UCL timetable for the time and room allocation.

Policy on engaging with AI

UCL provides guidance for "[Engaging with AI in Your Education and Assessment](#)" and [Using AI tools in assessment | Teaching & Learning - UCL – University College London](#).

Assessment 1 which takes the form of an essay has an AI Category 2 rating regarding the use of AI tools.

Category 2: AI tools can be used in an assistive role*

Students are permitted to use AI tools for specific defined processes within the assessment.

AI tools can be utilised to support the development of specific skills as required by the assessment. Students can leverage AI for tasks such as data analysis, pattern recognition, or generating insights. There will be some aspects of the assessment where the use of AI is inappropriate.

Examples of where AI might be used in an assistive category include:

- drafting and structure content
- supporting the writing process in a limited manner
- as a support tutor
- supporting a particular process such as testing code or translating content
- giving feedback on content, or proofreading content.

Assessment 2 which takes the form of an in person unseen exam has an AI Category 1 rating regarding the use of AI tools.

Category 1: AI tools cannot be used*

The purpose and format of these assessments makes it inappropriate or impractical for AI tools to be used.

Assessments where the use of AI is wholly inappropriate for the delivery of the specific learning activities or skills to be assessed might include, for example, demonstrating foundation level skills such as remembering, understanding, independently developing critical thinking skills, and applying knowledge or demonstrating fundamental skills that will be required throughout the programme.

Such assessments are likely to be designed to support the development of knowledge and skills that students will require in order to be able to study successfully and effectively, including with the use of AI tools in other contexts and in future assessments. Discussion with students will be required to explain the rationale for this category (for example, pedagogy, employability, etc).

- In-person unseen examinations.
- Class tests.
- Some online tests.
- Vivas.
- Some laboratories and practicals.
- Discussion-based assessments.

Students believed to have ignored the categorisation will undergo the standard academic misconduct procedure.

Aims and Objectives

Aims

- To teach students about the foundational thinkers and topics in 20th century philosophy of science.
- To provide students with a foundation in the philosophy of science required for further study in years 2 and 3.
- To teach students about some of the more recent conceptual and disciplinary shifts within the philosophy of science that have occurred in the early part of the 21st century.
- To promote thinking through theory using concrete, real world examples. Theoretical concepts will be grounded in case studies from scientific practice and the interplay between science and wider society.
- To integrate topics covered in the module with related theoretical concepts from other courses available within the Department of Science and Technology Studies.

Objectives

By the end of this module students should be able to:

- Evaluate the key philosophical accounts of many core topics in the philosophy of science.
- Write philosophically coherent essays, where philosophical theories are explained and arguments for them critically evaluated.
- Ground theoretical views in real world cases drawn from the history of science and contemporary science.
- Think philosophically about the core topics, analysing arguments critically, consider opposing views fairly and philosophically justify their own.
- Integrate the philosophical concepts learnt on this course with other HPS, STS and Philosophy courses.

Reading List:

Primary Introductory Text:

We will use this introductory text to the philosophy of science to assist you in the first five weeks with some of the foundational themes from 20th century philosophy of science.

- [Ladyman, J. \(2001\). *Understanding Philosophy of Science* \(1st ed.\). Routledge](#)

Other Introductions

- Bird, A. (1998) *Philosophy of Science*, London & New York: Routledge.
- [Chalmers, A. \(1978\) *What is this thing called Science?* Berkshire, Open University Press](#)
- [Dicken, Paul. \(2016\). *A critical introduction to scientific realism* London Bloomsbury.](#)
- [Godfrey-Smith, Peter\(2003\). *Theory and reality: an introduction to the philosophy of science.* University of Chicago Press.](#)
- [Okasha, Samir. \(2002\) *Philosophy of Science: A very short Introduction*, Oxford: Oxford University Press.](#)
- [Staley, Kent \(2014\). *An Introduction to the Philosophy of Science.* Cambridge University Press](#)

Handbooks and Anthologies:

- [Crasnow, Sharon., & Intemann, Kristen. \(2020\). *The Routledge Handbook of Feminist Philosophy of Science* London: Routledge](#)
- Curd and Cover, (2012) *Philosophy of Science: The Central Issues* (New Second Edition), Norton & Co (*Highly Recommended: This text is both an Anthology of readings and an Introduction*)
- [Humphreys, P. \(2016\). *The Oxford Handbook of Philosophy of Science* \(1st ed.\). Oxford University Press.](#)
- Lange, M. (2007). *Philosophy of science : an anthology / edited by Marc Lange.* Blackwell.
- [Saatsi, J. \(2018\). *The Routledge Handbook of Scientific Realism* \(1st ed.\). Routledge.](#)

Weekly Topics and Readings

(Week 20) 1. Scientific Knowledge

Lecture 1: Introduction to the philosophy of science

Lecture 2: Knowledge, Induction and Verificationism

Lecture Reading:

- [Ladyman, J. \(2001\). Understanding Philosophy of Science \(1st ed.\). London: Routledge Chapter 1 pp 11-30 "Induction and Inductivism" and Chapter 2 pp 31-61 "The Problem of Induction and Other Problems with Inductivism"](#)

Seminar Reading:

- [Ayer, A. J. 1952. "The Elimination of Metaphysics" \(Chapter 1\) in Language, Truth and Logic, Dover Publications Inc.](#)

Further Reading:

- [Ayer, A.J. \(1936\). "The Principle of Verifiability", in Mind, 45:199-203.](#)
- [Ayer, A. J. \(1981\). The Vienna Circle. Midwest Studies in Philosophy, 6\(1\), 173–188.](#)
- [Beebe, Helen. \(2011\). Necessary Connections and the Problem of Induction. Noûs 45\(3\), 504–527.](#)
- [Friedman, Michael. \(1999\). Reconsidering Logical Positivism Cambridge: Cambridge University Press](#)
- Goodman, Nelson. (1979). "The New Riddle of Induction" (Chapter 3) in *Fact Fiction Forecast*, Harvard University Press
- [Hume, D. 1777 \[1975\]. Sections 2, 3, 4 \(part 1\) in Enquiry Concerning Human Understanding](#)
- [Markie, Peter, "Rationalism vs. Empiricism", The Stanford Encyclopedia of Philosophy \(Spring 2023 Edition\), Edward N. Zalta & Uri Nodelman \(eds.\)](#)
- [Okasha, Samir. "Verificationism, Realism and Skepticism", in Erkenntnis 55:371-385](#)
- [Papineau, David. \(1992\). 'Reliabilism, Induction and Scepticism', in The Philosophical Quarterly, 42\(166\):1-20](#)
- [Russell, Bertand., & Skorupski, John . \(2001\). The Problems of Philosophy \(2nd ed.\). Oxford University Press](#)
- [Henderson, Leah, "The Problem of Induction", The Stanford Encyclopedia of Philosophy \(Winter 2022 Edition\), Edward N. Zalta & Uri Nodelman \(eds.\)](#)

(Week 21) 2. Falsificationism

Lecture 3: Popper and Falsificationism

Lecture 4: Underdetermination and Experiment

Lecture Reading:

- [Ladyman, J. \(2001\). Understanding Philosophy of Science \(1st ed.\). London: Routledge Chapter 3 pp 62-92 "Falsificationism"](#)

Seminar Reading:

- Popper, Karl . (1963) 'Science, Conjectures and Refutations' *Conjectures and Refutations*, London: Routledge and Kegan Paul: 33-39 in Curd and Cover: 3-10

Further Reading:

- [Duhem, Pierre. M. M. \(1982\). The aim and structure of physical theory . Princeton University Press. "Physical Theory and Experiment" \(Part 2, chapter 6\)](#)
- [Elgin, Catherine \(2011\). The Legacy of "Two Dogmas". American Philosophical Quarterly \(Oxford\), 48\(3\), 267–272](#)
- [Grünbaum, Adolf. \(1976\). Is the Method of Bold Conjectures and Attempted Refutations Justifiably the Method of Science? The British Journal for the Philosophy of Science, 27\(2\), 105–136.](#)
- [Jeffrey, Richard \(1975\). Probability and Falsification: Critique of the Popper Program. Synthese 30\(1/2\), 95–117.](#)
- [Jones, Gary., & Perry, Clifton. \(1982\). Popper, Induction and Falsification. Erkenntnis, 18\(1\), 97–104.](#)
- [Massey, Gerald \(2011\). Quine and Duhem on Holistic Hypothesis Testing. American Philosophical Quarterly 48\(3\), 239–266.](#)
- [Mellor, D. Hugh. \(1977\). The Popper Phenomenon. Philosophy 52\(200\), 195–202.](#)
- [Popper, Karl. \(1959\). The Logic of Scientific Discovery \(2nd ed.\). Routledge.](#)
- [Popper, Karl. 1976. A Note on Verisimilitude. British Journal for the Philosophy of Science 27 \(2\):147-159.](#)
- [Stanford, Kyle. "Underdetermination of Scientific Theory", The Stanford Encyclopedia of Philosophy \(Summer 2023 Edition\), Edward N. Zalta & Uri Nodelman \(eds.\)](#)
- [Quine, W.V.O. 1951. "Two Dogmas of Empiricism", in The Philosophical Review, 60\(1\):20-43.](#)

(Week 22) 3. Historicism

Lecture 5: Kuhn, Revolution and Normal Science

Lecture 6: Incommensurability and Relativism

Lecture Reading:

- [Ladyman, J. \(2001\). Understanding Philosophy of Science \(1st ed.\). London: Routledge Chapter 4 pp 93-125 "Revolutions and Rationality"](#)

Seminar Reading:

- [Longino, Helen. \(2012\). Lessons from Teaching The Structure of Scientific Revolutions. Historical Studies in the Natural Sciences, 42\(5\), 542–544](#)
- [Kuhn, T. S. \(1963\). The structure of scientific revolutions Chicago: University of Chicago Press Chapter 2 "The Route to Normal Science", Chapter 7 "Crisis and Emergence of Scientific Theories" and Chapter 9 "The Nature and Necessity of Scientific Revolutions".](#)

Further Reading:

- [Bird, Alexander. \(2005\). Naturalizing Kuhn. Proceedings of the Aristotelian Society, 105\(1\), 99–117.](#)
- [Bird, Alexander, "Thomas Kuhn", The Stanford Encyclopedia of Philosophy \(Spring 2022 Edition\), Edward N. Zalta \(ed.\)](#)
- [Bschir, Karim., & Shaw, Jamie. \(Eds.\). \(2021\). Interpreting Feyerabend : critical essays / edited by Karim Bschir, Jamie Shaw. Cambridge University Press.](#)
- Feyerabend, Paul. (1975). *Against Method*, Verso.
- [Hesse, Mary. \(1982\). Comment on Kuhn's Commensurability, Comparability, Communicability. Proceedings of the Biennial Meeting of the Philosophy of Science Association \(2\), 704–711.](#)
- [Kitcher, Philip. \(2012\). The Many Lessons of Structure. Historical Studies in the Natural Sciences, 42\(5\), 255–282.](#)
- [Kuhn, Thomas \(1982\). Commensurability, Comparability, Communicability. Proceedings of the Biennial Meeting of the Philosophy of Science Association \(2\) 669–688.](#)
- [Kuhn, Thomas. S \(1970\). Reflections on my Critics. In Criticism and the Growth of Knowledge 231–278. Cambridge :Cambridge University Press.](#)
- [Massimi, Michela. \(2015\). 'Working in a new world': Kuhn, constructivism, and mind-dependence. Studies in History and Philosophy of Science. Part A, 50\(1\), 83–89.](#)
- [Masterman, Margaret. \(1970\). The Nature of a Paradigm. In Criticism and the Growth of](#)

[Knowledge 59–90. Cambridge:Cambridge University Press.](#)

- [Nye, Mary Jo. \(2012\). Thomas Kuhn, Case Histories, and Revolutions. Historical Studies in the Natural Sciences, 42\(5\)](#)
- [Popper, Karl \(1970\). Normal Science and its Dangers. In Criticism and the Growth of Knowledge 51–58 Cambridge: Cambridge University Press.](#)

(Week 23) 4. Realism and Anti-Realism

Lecture 7: Realism and the No-Miracles Argument

Lecture 8: Anti-Realism and the Pessimistic Meta-Induction

Lecture Reading:

- [Ladyman, James. \(2001\). Understanding Philosophy of Science \(1st ed.\). London: Routledge Chapter 5 pp 129- 161 "Scientific Realism"](#)

Seminar Reading

- [Laudan, Larry. \(1981\). A Confutation of Convergent Realism. Philosophy of Science, 48\(1\), 19–49](#)
- Musgrave, Alan "The Ultimate Argument for Scientific Realism", in Robert Nola (ed.), *Relativism and Realism in Science*, 253-291

Further Reading:

- [Elsamahi, Mohamed. \(2005\). A Critique of Localized Realism. Philosophy of Science, 72\(5\), 1350–1360](#)
- [Carrier, Martin \(1991\). What is wrong with the miracle argument? Studies in History and Philosophy of Science., 22\(1\), 23–36.](#)
- [Chakravartty, Anjan. \(2007\). A Metaphysics for Scientific Realism: Knowing the Unobservable \(1st ed.\). Cambridge University Press.](#)
- [Chakravartty, Anjan, "Scientific Realism", The Stanford Encyclopedia of Philosophy \(Summer 2017 Edition\), Edward N. Zalta \(ed.\)](#)
- [Chang, Hasok. \(2001\). How to Take Realism Beyond Foot-Stamping. Philosophy 76\(1\), 5–30.](#)
- [Dicken, Paul. \(2016\). A critical introduction to scientific realism London Bloomsbury.](#)
- [Hawley, Katherine. \(2006\). Science as a Guide to Metaphysics? Synthese 149\(3\)](#)

- [Massimi, Michela. \(2016\). Three Tales of Scientific Success. *Philosophy of Science*, 83\(5\), 757–767.](#)
- [Putnam, Hilary. \(1976\). X—What Is “Realism”? *Proceedings of the Aristotelian Society*, 76\(1\), 177–194.](#)
- Psillos, Stathis. (1999). *Scientific realism : how science tracks truth* London: Routledge
- [Psillos, Stathis. \(1996\). Scientific Realism and the “Pessimistic Induction.” *Philosophy of Science*, 63\(3\), S306–S314](#)
- [Saatsi, Juha \(2005\). On the Pessimistic Induction and Two Fallacies. *Philosophy of Science*, 72\(5\), 1088–1098.](#)

(Week 24) 5. Turns in the Realism Debate

Lecture 9: Constructive Empiricism

Lecture 10: Entity Realism and Natural Kind Realism

Lecture Reading:

- [Saatsi, Juha. \(2018\). *The Routledge Handbook of Scientific Realism*, London: Routledge Chapter 8 pp 96-107 “Empiricism” Chapter 10 pp 120-132 “Entity Realism”](#)

Seminar Reading:

- [Van Fraassen, Bas \(1980\). *The scientific image* Oxford: Clarendon Chapter 2 pp 6-40 “Arguments Concerning Scientific Realism”](#)
- [Hacking, Ian. \(1983\). *Representing and Intervening* Cambridge: Cambridge University Press. Chapter 16 pp 262-275 “Experimentation and Scientific Realism”](#)

Further Reading:

- [Cartwright, Nancy, \(1983\) 'Essay 5:When Explanation Leads to Inference', in *How the Laws of Physics Lie* \(Oxford, Oxford University Press\)](#)
- Churchland, Paul. M., Hooker, C. A. (Clifford A., & Van Fraassen, B. C.) (1985). *Images of science : essays on realism and empiricism, with a reply from Bas C. van Fraassen / edited by Paul M. Churchland and Clifford A. Hooker.* University of Chicago Press.
- [Eronen, Markus \(2015\). *Robustness and reality.* *Synthese*, 192\(12\), 3961–3977.](#)
- [Hacking, Ian. \(1989\). *Extragalactic Reality: The Case of Gravitational Lensing.* *Philosophy of Science*, 56\(4\), 555–581.](#)
- [Khalili, Mahdi. \(2023\). *A Dialogue among Recent Views of Entity Realism.* *Philosophy of Science*,](#)

[90\(4\), 901–921.](#)

- [Ladyman, James. \(2000\). What's Really Wrong with Constructive Empiricism? Van Fraassen and the Metaphysics of Modality. The British Journal for the Philosophy of Science, 51\(4\), 837–856](#)
- [Massimi, Michela. \(2004\). Non-defensible middle ground for experimental realism: Why we are justified to believe in coloured quarks. Philosophy of Science , 71 \(1\) 36 - 60](#)
- [Massimi, Michela. \(2007\). Saving Unobservable Phenomena. The British Journal for the Philosophy of Science, 58\(2\), 235–262.](#)
- [Miller, Boaz. \(2016\) "What Is Hacking's Argument for Entity Realism?" Synthese 193, 991–1006](#)
- [Morrison, Margaret. \(1990\). Theory, Intervention and Realism. Synthese, 82\(1\), 1–22.](#)
- [Nanay, Bence. \(2019\). Entity realism and singularist semirealism. Synthese, 196\(2\), 499–517.](#)
- [Resnik, David \(1994\). Hacking's Experimental Realism. Canadian Journal of Philosophy, 24\(3\), 395–411.](#)
- [Van Fraassen, Bas \(2001\). Constructive Empiricism Now. Philosophical Studies, 106\(1/2\), 151–170.](#)

(Week 25) Reading Week

(Week 26) 6. The Pragmatic Turn

Lecture 11: Idealisations and models in science

Lecture 12: Case studies in the philosophy of science

Lecture Reading:

- [Saatsi, Juha. \(2018\). The Routledge Handbook of Scientific Realism, London: Routledge Chapter 19 pp 237-249 "Modelling and Realism"](#)

Seminar Reading:

- [Elgin, Catherine. \(2004\). "True Enough" in Philosophical Issues, 14:113-131](#)
- [Currie, Adrian. \(2015\). Philosophy of Science and the Curse of the Case Study. In: Daly, C. \(eds\) The Palgrave Handbook of Philosophical Methods. Palgrave Macmillan, London.](#)

Further Reading:

- [Alexandrova, Anna. \(2008\). Making Models Count. Philosophy of Science, 75\(3\), 383–404.](#)
- [Cartwright, Nancy. \(1983\). How the laws of physics lie Oxford: Clarendon Press](#)
- [Chang, Hasok. \(2011\). The Persistence of Epistemic Objects Through Scientific Change. Erkenntnis, 75\(3\), 413–429.](#)
- [Chang, Hasok. \(2022\). Realism for realistic people : a new pragmatist philosophy of science Cambridge: Cambridge University Press.](#)
- [Chao, Hsiang.-K., & Reiss, Julien. \(Eds.\). \(2017\). Philosophy of science in practice : Nancy Cartwright and the nature of scientific reasoning / Hsiang-Ke Chao, Julian Reiss, editors. Springer.](#)
- [Frigg, Roman and Stephan Hartmann, "Models in Science", The Stanford Encyclopedia of Philosophy \(Spring 2020 Edition\), Edward N. Zalta \(ed.\)](#)
- [Elgin, Catherine. \(2007\). Understanding and the Facts. Philosophical Studies, 132\(1\), 33–42.](#)
- [Hesse, Mary \(1953\). Models in Physics. The British Journal for the Philosophy of Science, 4\(15\), 198–214.](#)
- Hesse, Mary (1966). *Models and analogies in science* University of Notre Dame Press

- [Illari, Phyllis, McKay., & Russo, Federica. \(2014\). Causality : philosophical theory meets scientific practice / Phyllis Illari, Federica Russo. Oxford University Press.](#)
- [Leonelli, Sabina. \(2019\). What distinguishes data from models? European Journal for Philosophy of Science, 9\(2\), 22–27.](#)
- [Morrison, Margaret., & Morgan, Mary. \(1999\). “Models as mediating instruments”. In M. Morgan & M. Morrison \(Eds.\), Models as Mediators: Perspectives on Natural and Social Science](#)
- [Parker, Wendy \(2020\). Model Evaluation: An Adequacy-for-Purpose View. Philosophy of Science, 87\(3\), 457–477](#)
- [Weisberg, Michael. \(2007\). Three Kinds of Idealization. The Journal of Philosophy, 104\(12\), 639–659.](#)

(Week 27) 7. Values and Science

Lecture 13: Values, Science and Objectivity

Lecture 14: Feminist Approaches in the Philosophy of Science

Lecture Reading:

- [Anderson, Elizabeth, "Feminist Epistemology and Philosophy of Science", The Stanford Encyclopedia of Philosophy \(Spring 2020 Edition\), Edward N. Zalta \(ed.\)](#)

Seminar Reading:

- [Longino, Helen \(1990\). Chapter 4 Values and Objectivity. In Science as Social Knowledge: Values and Objectivity in Scientific Inquiry \(pp. 62–82\). Princeton University Press.](#)
- [Crasnow, Sharon., & Intemann, Kristen. \(2020\). The Routledge Handbook of Feminist Philosophy of Science London: Routledge Chapter pp 79-88 "Feminist Epistemology"](#)

Further Reading:

- [Douglas Heather. \(2000\) 'Inductive Risk and Values in Science', Philosophy of Science, 67\(4\).](#)
- [Douglas Heather \(2007\) 'Rejecting the Ideal of Value-Free Science' in Value Free Science? Ideals and Illusions \(2007\), pp 120-140](#)
- [Douglas, Heather. \(2013\). The Value of Cognitive Values. Philosophy of Science, 80\(5\), 796–806](#)
- [Elliott, Kevin, & Richards, Ted. \(2017\). Exploring Inductive Risk: Case Studies of Values in Science. Oxford University Press.](#)
- Lloyd, Elisabeth. Anne. (2005). *The case of the female orgasm : bias in the science of evolution* , Cambridge MA: Harvard University Press.

- [Nyrup, Rune, Chu, Charlene H., and Falco, Elena, "Digital ageism, algorithmic bias, and feminist critical theory." *Feminist AI: Critical Perspectives on Algorithms, Data, and Intelligent Machines* \(2023\): 309.](#)
- [Longino, Helen\(1987\). Can There Be A Feminist Science? *Hypatia*, 2\(3\), 51–64.](#)
- [Longino, Helen \(1994\). In Search of Feminist Epistemology. *The Monist*, 77\(4\), 472–485.](#)
- [Putnam, Hilary. \(2002\). *The collapse of the fact/value dichotomy and other essays* / Hilary Putnam. Harvard University Press.](#)
- [Resnik, David, & Elliott, Kevin \(2019\). Value-entanglement and the integrity of scientific research. *Studies in History and Philosophy of Science. Part A*, 75, 1–11.](#)
- [Reiss, Julian and Jan Sprenger, "Scientific Objectivity", *The Stanford Encyclopedia of Philosophy* \(Winter 2020 Edition\), Edward N. Zalta \(ed.\)](#)
- [Wylie, Alison. \(1995\). Doing Philosophy As a Feminist: Longino on the Search for a Feminist Epistemology. *Philosophical Topics*, 23\(2\), 345–358.](#)

(Week 28) 8. Philosophy of Technology

Lecture 15: Technoscience

Lecture 16: Artificial Intelligence

Lecture Reading:

- [Franssen, Maarten, Gert-Jan Lokhorst, and Ibo van de Poel, "Philosophy of Technology", *The Stanford Encyclopedia of Philosophy* \(Spring 2023 Edition\), Edward N. Zalta & Uri Nodelman \(eds.\)](#)

Seminar Reading:

- [Boon, M. \(2015\). The scientific use of technological instruments. In S. O. Hansson \(Ed.\), *The Role of Technology in Science: Philosophical Perspectives* \(pp. 55-79\). \(*Philosophy of Engineering and Technology*; No. 18\). Springer. \[https://doi.org/10.1007/978-94-017-9762-7_4\]\(https://doi.org/10.1007/978-94-017-9762-7_4\)](#)
- [van de Poel, Ibo \(2020\) *Embedding Values in Artificial Intelligence \(AI\) Systems. *Minds & Machines* 30, 385–409*](#)

Further Reading:

- [Elder, C. L. \(2007\). On the place of artifacts in ontology. In E. Margolis & S. Laurence \(Eds.\),](#)

Creations of the mind: Theories of artifacts and their representation (pp. 33–51). Oxford: Oxford University Press.

- [Franssen, Maarten, P. Reydon, T. & Vermaas P, \(2013\) Introduction: The Ontology of Technical Artefacts in Artefact Kinds: Ontology and the Human Made World, Springer.](#)
- [Franssen, Maarten \(2008\). Design, use, and the physical and intentional aspects of technical artifacts. In P. E. Vermaas, P. Kroes, A. Light, & S. A. Moore \(Eds.\), Philosophy and design: From engineering to architecture \(pp. 21–35\). Dordrecht: Springer.](#)
- [Kroes, P., & Meijers, A. W. M. \(2006\). The dual nature of technical artifacts. Studies in History and Philosophy of Science, 37, 1–4](#)
- Russo, Federica (2022), Technoscientific practices: an Informational approach, Rowman & Littlefield International.
- [Vallor, Shannon \(ed\). \(2021\) Oxford Handbook of Philosophy of Technology. Oxford University Press, Oxford.](#)

(Week 29) 9. Essay Workshop

Lecture 17 Essay Workshop I: How to write a philosophy essay.

Lecture 18 Essay Workshop II: Essay Clinic

The reading for this week is light, however, please ensure that you read “Writing a Philosophy Paper” by John Devine. The link for this reading will be on the Moodle page for the module.

(Week 30) 10. Explanation, understanding and looking forward.

Lecture 19: Science, explanation and understanding.

Lecture 20: Conclusion and looking forward.

Lecture Reading:

- [Ladyman, James. \(2001\). *Understanding Philosophy of Science* \(1st ed.\). London: Routledge Chapter 7 pp 196-229 "Explanation and Inference"](#)

Further Reading:

- [Friedman, Michael \(1974\). *Explanation and Scientific Understanding*. *Journal of Philosophy*, 71\(1\), 5–19](#)
- [Van Fraassen, Bas\(1977\). *The Pragmatics of Explanation*. *American Philosophical Quarterly*, 14\(2\), 143–150](#)

Introductory readings looking forward to more advanced study:

- [Broadbent, Alex. \(2019\). *Philosophy of medicine* Oxford: Oxford University Press.](#)
- [Illari, Phyllis et al. \(2013\). *An introduction to the Philosophy of Information*. The Society for the Philosophy of Information.](#)
- [O'Connor, Cailin, Sanford Goldberg, and Alvin Goldman, "Social Epistemology", *The Stanford Encyclopedia of Philosophy* \(Winter 2023 Edition\), Edward N. Zalta & Uri Nodelman \(eds.\)](#)
- [Okasha, Samir. \(2019\). *Philosophy of biology : a very short introduction* / Samir Okasha. Oxford University Press.](#)
- [Rosenberg, Alexander. \(2016\). *Philosophy of social science* / Alexander Rosenberg, Duke University. \(Fifth edition.\). Westview Press](#)
- [Schrenk, Markus. \(2016\). *Metaphysics of science : a systematic and historical introduction* / Markus Schrenk. Routledge.](#)