

THE UNIVERSITY OF WESTERN ONTARIO
DEPARTMENT OF PHILOSOPHY
Undergraduate Course Outline 2016-2017

Philosophy 2300F: Philosophy of Science

Fall Term 2016

Tu 13:30–14:30; Th 13:30–15:30

Physics & Astronomy 34

Instructor: Wayne C. Myrvold

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Office: Stevenson Hall 4143

Office Hours: MW 12:30–13:30, or by appointment

DESCRIPTION

Philosophy of science addresses questions such as: What is the difference between science and non-science? What sort of knowledge can we expect from science? Does it give us objective knowledge of the world? If so, can this knowledge extend beyond knowledge of what is directly observable? What is the proper role of science in society, and what are the ethical obligations of scientists?

We will address these questions in connection with two case studies of scientific revolution: and the Darwinian revolution in the 19th and 20th centuries, and the Copernican revolution at the birth of modern science. Both of these have implications for the relation between science and the wider culture. We will look at writings of the scientists involved, as well as major works by philosophers of science. The aim is for students to form their own thoughts on the questions to be addressed.

No prior background in science or philosophy is assumed.

Antirequisite: Philosophy 2030F/G (126F/G).

TEXTS

Selected readings, available on WebCT.

OBJECTIVES

The chief objective of this course is to introduce the students to key issues in philosophy of science. Students will be able to distinguish between scientific realism and various forms of anti-realism, to identify the strengths and weaknesses of the major approaches to scientific inference, and to apply these concepts to our two case studies, the Copernican revolution and the Darwinian revolution.

REQUIREMENTS

Attendance and active participation in class discussions; 2 short writing assignments; two tests; term paper.

Writing assignment 1 (3–5 pp), due Oct. 7	15%
Writing assignment 2 (3–5 pp), due Nov. 11	15%
Test 1 in class, Oct. 21	20%
Test 2 date TBA, during exam period	20%
Term paper (7–10 pp), due Dec. 7	<u>30%</u>
	100%

For written assignments, both hard copy and turnitin submission is required. Hard copy is to be handed in by 3:45 PM on the due date, and turnitin submission, by 11:59 PM. If you are unable to hand your assignment directly to the instructor, place it in the Philosophy Department drop-off box, which is on the first floor of Stevenson Hall. *Make sure that your name and the instructor's name are on your assignment.* Late assignments will be penalized 5% per day late.

In conformity with departmental policy all written assignments must be submitted to turnitin.com for plagiarism checking by the due date. Assignments not submitted to turnitin by the due date will be counted as late, and students will not receive credit for written assignments not submitted to turnitin.com.

No papers will be accepted after the last day of classes, Dec. 7, 2016.

AUDIT

Students wishing to audit the course should consult with the instructor prior to or during the first week of classes.

The **Department of Philosophy Policies** which govern the conduct, standards, and expectations for student participation in Philosophy courses is available in the Undergraduate section of the Department of Philosophy website at <http://uwo.ca/philosophy/undergraduate/proceduresappeals.html>. It is your responsibility to understand the policies set out by the Senate and the Department of Philosophy, and thus ignorance of these policies cannot be used as grounds of appeal.

Phil 2300F: Philosophy of Science
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Reading List.

Subject to Revision, with ample notice. In particular, we may choose to spend more time than scheduled on certain items, with re-adjustment elsewhere.

Week 0 Sept. 9

Introduction: What is philosophy of science?

Case Study I: The Copernican Revolution

Week 1. Sept. 12, 14, 16

Background to the Copernican revolution.

1. Singh, "The Copernican Myths"

Week 2: Sept. 19, 21, 23

1. Excerpts from Galileo Galilei, *Dialogue Concerning the Two Chief World Systems*. tr. Stillman Drake (Berkeley: University of California Press, 1967).

Case Study II: The Darwinian Revolution

Week 3: Sept. 26, 28, 30

Darwin's theories and Darwin's methodology

1. Excerpts from Darwin, *Origin of Species*
2. Excerpts from Jerry A. Coyne, *Why Evolution is True*.

Week 4: Oct. 3, 5, 7

What is Science? The status of Creationism

1. Michael Ruse, "Creation-Science Is Not Science," in Marcel C. La Follette, ed., *Creationism, Science, and the Law: The Arkansas Case* (Cambridge: The MIT Press, 1983), pp. 150–160.
2. Larry Laudan, "Commentary on Ruse: Science at the Bar—Causes for Concern," in La Follette, ed., pp. 161–166.
3. Michael Ruse, "Response to Laudan's Commentary: Pro Judice," in La Follette, ed., 167–173.

Assignment 1 due Fri., Oct. 7

Week 5: Oct.12, 14

What is Science? The Status of Intelligent Design

1. Bradley Monton, "Is Intelligent Design Science? Dissecting the Dover Decision"
2. Robert Pennock, "Deus ex Machina," in *Tower of Babel: The Evidence against the new creationism*. (Cambridge, MA: The MIT Press, 2002), pp. 277–308.

Week 6: Oct. 17, 19, 21

Induction

1. Peter Lipton, "Induction," Ch. 1 of *Inference to the Best Explanation* (2nd ed., London: Routledge, 2004), pp. 5–20.

Test 1 in class Friday, Oct. 21

Week 7: Oct. 24, 26, 28

Underdetermination

1. Excerpts from Duhem, *The Aim and Structure of Physical Theory*.
2. John Norton, "Must Evidence Underdetermine Theory?" in Martin Carrier, Don Howard, and Janet Kourany, eds., *The Challenge of the Social and the Pressure of Practice* (University of Pittsburgh Press, 2008), pp. 17–44.

Recommended:

Laudan, "Demystifying Underdetermination," in Martin Curd and J. A. Cover, eds., *Philosophy of Science: The Central Issues* (New York: W. W. Norton & Company, 1998), pp. 320–353.

Week 8: Oct. 31. Nov. 2. 4 *Theory Confirmation*

1. John Earman and Wesley C. Salmon, "The Confirmation of Scientific Hypotheses," in Merilee Salmon, et al. eds., *Introduction to the Philosophy of Science* (Indianapolis: Hackett Publishing Co., 1999), pp. 42–53.

Week 9: Nov. 7, 9, 11

Probabilistic (Bayesian Accounts of confirmation)

1. Wesley C. Salmon. "Rationality and Objectivity in Science, or Tom Kuhn meets Tom Bayes," in David Papineau, ed., *The Philosophy of Science* (Oxford: Oxford University Press, 1996), pp. 256–289.

Assignment 2 due Friday, Nov.11.

Week 10: Nov. 14, 16, 18

Kuhn

1. Excerpt from Thomas S. Kuhn, *The Structure of Scientific Revolutions*.
2. Thomas S. Kuhn, "The Road Since Structure," in *The Road Since Structure* (Chicago: The University of Chicago Press, 2000), pp.13–32.

Week 11: Nov. 21, 23, 25

Realism and anti-realism

1. Laudan, "A Confutation of Convergent Realism"
2. Michael Devitt, "Realism/Anti-Realism," in Stathis Psillos and Martin Curd, eds., *The Routledge Companion to Philosophy of Science* (London: Routledge, 2008).

Week 12: Nov. 28, 30. Dec.2.

Science in the larger culture

1. James Robert Brown, "Privatizing the University: The New Tragedy of the Commons." *Science* **290**, pp, 1701–1702.
2. Heather Douglas, "Bullshit at the Interface of Science and Policy: Global Warming, Toxic Substances, and Other Pesky Problems," in Gary L. Hardcastle and George A. Reisch, eds., *Bullshit and Philosophy* (Open Court) , pp. 213-226.

Week 13: Dec. 5. 7

Wrap-up

Term paper due Wednesday, Dec. 7.