

THE UNIVERSITY OF WESTERN ONTARIO  
DEPARTMENT OF PHILOSOPHY  
Undergraduate Course Outline Winter 2012  
Philosophy 2030G: Philosophy of Science  
Previously Philosophy 226

**Winter Term 2012**

**Classes** Mo. We. Fr. 12:30-13:30

**Room:** TC-343

**Office Hours:** By appointment (basically, any time)

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## 1 Course Objectives

Philosophy of science is a discipline that studies the nature, methodology and scope of scientific inquiry. Traditionally, it deals with topics such as the demarcation between science and pseudo-science, the nature of scientific explanation, the logical structure of scientific theories, the empirical confirmation of scientific theories, the significance of scientific revolutions, the nature of scientific laws, *etc.*

Why study philosophy of science? Whether you are a science student or not, you encounter claims on a daily basis whose validation comes from being “scientific.” You are to a large extent socially expected to give your assent to claims alleged to be scientific. As a matter of fact, science is today’s most powerful social institution in that it alone has the power to change beliefs *en masse* over very short periods of time. Nowadays, adding the epithet “scientific” to an assertion lends it the highest degree of credibility. Accordingly, it is important to refine our conception of what science is, is not, does, does not, can do, can’t do, *etc.* The objective of this introductory course in philosophy of science is to give you conceptual tools to exert critical thought in this respect. No prior background in science or philosophy is assumed for this course, but a willingness to examine abstract problems, arguments, and theories will be required.

Now, it is often claimed that the best way to understand the nature and methodology of science is by doing science: Why appeal to philosophy to discuss science? Aren’t scientists the most qualified people to discuss the scientific method? Such claims ignore the diversity of practices of scientific justification across the fields. As O. Neurath once said,

[t]here is no scientific method. There are only scientific methods. And each of these is fragile; replaceable, indeed destined for replacement; contested from decade to decade, from discipline to discipline, even from lab to lab.

Philosophers of science try to find the objective principles that give grounds to the particular “methods” that scientists adopt at different time, for different problems,

in different disciplines. Thus, philosophy of science studies the common conceptual ground justifying the adoption of particular “methods” in different circumstances. Accordingly, for the same reason that you can be good at riding a bike without knowing how you achieve it, you can be good at doing science without knowing exactly why what you’re doing is right. It is in this respect that philosophy of science constitutes a valuable type of enquiry on the nature, methodology, and scope of science.

## 2 Method of Instruction

The lectures will present the material in a clear and engaging way. Each week, there will be two hours of lectures, and one hour of discussion and/or debate lead by students. Students are expected to attend classes and participate. Moreover, students will need to access WebCT regularly for readings and assignments.

We are all expected to come to class having carefully read and understood the week’s selected readings.

## 3 Requirements & Schedule

Late penalties for assignments will be 20%/day. Exceptions will be granted according to the university regulations only.

The evaluations and their respective weights will be the following:

1. Participation: Total 15%
  - (a) Attending, not sleeping, and paying attention in class (5%);
  - (b) Leading a debate/discussion (5%);
  - (c) Actively engaging in debate/discussion lead by students (5%).
2. 2-4 (to be determined) homework assignments. Total 20%
3. Term project in four parts: Total 65%
  - (a) Choice of problem/topic (5%);
  - (b) Explanation of the problem/topic selected, with brief literature review (4-5 pages, 15%);
  - (c) Report examination on the relevant literature (10%);
  - (d) Final project (12-15 pages, 35%).

There is no final exam.

Most of the assignments (about basic logic & probability), as well as item (3a), will be due before the Spring break. Items (3b) and (3c) will be due after Spring break, and (3d) will be due at the end of the term. For the term project, a list of problems/topics will be made available to the students, together with some relevant literature students will be expected to know (if they choose to work on this problem). Example of problems include, but will not be limited to,

- the problem of induction;
- the demarcation between science and pseudoscience;
- the problem of underdetermination of theory by evidence;
- the role of mathematics in science;
- the nature of scientific explanation;
- the role of truth and idealization in scientific explanation;
- the role of chance in physical theory;
- the interpretation of quantum mechanics;
- the scientific grounds of climate science;
- the Darwinian revolution on biology;
- the distinction between formal and empirical science;
- the Bayesian perspective on statistical confirmation;
- the place of value judgements in science.
- the nature of space and time, *viz.* Einstein's theory of relativity;

Students can also choose another topic provided that they agreed with the instructor. Depending on their backgrounds, students will have the choice between more or less technically difficult problems.

## 4 Texts

The readings discussed in class will be based on the following:

- Balashov & Rosenberg (Eds.), *Philosophy of Science: Contemporary Readings*, Routledge, London and New York, 2002..
- Additional material will be posted on WebCT (in PDFs).

Note that I might change my mind about the texts and decide to go only with PDFs. Wait until I email the students enrolled to confirm before buying anything.

## 5 Audit & Department Policy

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://www.uwo.ca/philosophy/undergraduate/policies.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.