

# 145: Philosophy of Science

Christian Wüthrich

Spring 2008

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Class schedule: TuTh 11:00-12:20, York 4080A  
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What is science and what distinguishes it from “pseudoscience”? What is the “scientific method”, if there is any, and on what basis can it claim to ensure the objectivity of scientific results? How does science explain our observations and experiences? Does scientific knowledge progressively grow in a linear fashion or is its evolution dominated by radical revolutions? Are the scientists’ grounds for rejecting an old idea and for replacing it with a novel theory completely rational and logically reconstructible or are they substantially influenced by irrational factors? Do scientific theories give literally true accounts of the world as it is, or should we regard even the most elaborate and well-confirmed theory merely as a useful tool to systematize our experience?

In the course of this class, we shall study these questions by discussing the most influential accounts that have historically been given of the nature of science. Occasionally, we will delve into pertinent episodes in the history of science or into a non-technical discussion of scientific theories, but the clear focus shall be on philosophical debates concerning the nature of science.

*Prerequisites:* Upper-division standing or permission of instructor.

## Required texts

- Peter Godfrey-Smith, *Theory and Reality: An Introduction to the Philosophy of Science*, The University of Chicago Press, 2003.
- There are two additional sources for readings in this class: the *Stanford Encyclopedia of Philosophy* (SEP) and e-reserves. Links to both are available on the course web page.

## Course requirements and evaluation

The grade for this course will be determined by the total points a student earns from the three types of evaluation indicated below. I guarantee that a total of 60 points will earn at least a **D** and a total of 70 points will at least get you a **C**. If you take the class for a Pass/Fail grade, you must have at least a **C** in order to pass the class.

1. *Quizzes* (20 points): There will be **five short quizzes** during the quarter, each worth 4 points. They will be announced in class one meeting before they will be held. No make-up quizzes will be given.

2. *Midterm papers* (2×20 points) [[turnitin.com](http://turnitin.com)]: There will be two **take-home midterm papers** due on 29 April and 20 May 2008 at the beginning of class. These papers are “open books”, i.e. you are allowed—and encouraged—to use any sources such as libraries or the internet, and you are permitted to discuss the papers with your classmates. All sources, including discussions with classmates, must be appropriately acknowledged. *All answers given must be in your own wording.* Closely paraphrasing or simply copying the work of others (such as authors of books or articles, or classmates) is not allowed and will be severely penalized. You must ask me in case you are uncertain whether something constitutes plagiarism. For each day your paper is late, five points will be deducted from your point total, although no negative point totals will be given for the midterm papers.
3. *Final exam* (40 points): There will be a **final exam** on TBA, in a location to be announced. This exam will consist only of multiple-choice questions. You are not allowed to use any books or notes or the like, i.e. the exam is “closed-books”. The final exam is cumulative, i.e. it covers all the material of the entire course.

The midterm papers must be submitted *both as hard copies as well as through [turnitin.com](http://turnitin.com) by their due dates* in order to earn credit. You must enroll at [turnitin.com](http://turnitin.com) by creating a new profile. You will need the following course information:

Class ID: 2189041

Enrollment Password: phil145sp08

If you have any problems with using [turnitin.com](http://turnitin.com), you can contact the Instructional Web Development Center of Academic Computing Services at 858-822-3315 or [iwdc@ucsd.edu](mailto:iwdc@ucsd.edu).

## The fine print

Students agree that by taking this course all required papers will be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the terms of use agreement posted on the Turnitin.com site.

You must observe the University’s Policy on Integrity of Scholarship, which can be found at <http://www-senate.ucsd.edu/manual/appendices/app2.htm>.

Make-up exams (for both midterm and final) will only be given under the most severe circumstances. The student who wishes to write a make-up exam must inform me (by phone or email) ahead of the time of when the exam is due (midterm) or takes place (final). In order to qualify for a make-up exam, appropriate evidence of the most severe circumstances must be produced by the student. I will determine, in consultation with the student, what qualifies as appropriate evidence.

## Tentative schedule

<b>Final Exam:</b> TBA
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<b>Date</b>	<b>Topic and reading assignments</b>
1 April	Introduction: What is science? What is philosophy of science?
3 April	A brief history of philosophy of science <i>Godfrey-Smith, Ch 1</i>
8 April	Demarcating science vis-à-vis pseudoscience <i>Ruse, "Creation-science is not science", e-reserves</i> <i>Laudan, "Commentary", e-reserves</i> <i>Ruse, "Response to the commentary", e-reserves</i>
10 April	Logical Empiricism <i>Godfrey-Smith, Ch 2</i>
15 April	Explanation: D-N model (and I-S model) <i>Hempel, "Two basic types of scientific explanation", e-reserves</i> <i>Godfrey-Smith, Secs 13.1 and 13.2</i> <i>James Woodward, "Scientific explanation", SEP</i>
17 April	Explanation, reduction, unification <i>Godfrey-Smith, Secs 13.3 and 13.4</i> <i>Philip Kitcher, "Explanatory unification", e-reserves</i>
22 April	Laws of Nature <i>John W Carroll, "Laws of nature", SEP</i>
24 April	Induction and confirmation <i>Godfrey-Smith, Ch 3</i> <i>Carl G Hempel, "Studies in the logic of confirmation (I) and (II)", e-reserves</i>
29 April	Underdetermination and holism ( <b>Paper 1 due</b> ) <i>Duhem, "Physical theory and experiment", e-reserves</i>
1 May	Popper's falsificationism <i>Popper, "The problem of induction", e-reserves</i> <i>Godfrey-Smith, Ch 4</i>
6 May	Kuhn and normal science <i>Godfrey-Smith, Ch 5</i>
8 May	Kuhn and revolutions <i>Godfrey-Smith, Ch 6</i>
13 May	Lakatos, Feyerabend <i>Godfrey-Smith, Ch 7</i>
15 May	The challenge from sociology of science <i>Godfrey-Smith, Ch 8</i>
20 May	Feminism and science studies ( <b>Paper 2 due</b> ) <i>Godfrey-Smith, Ch 9</i> <i>Okruhlik, "Gender and the biological sciences", e-reserves</i>
22 May	Naturalistic philosophy <i>Godfrey-Smith, Ch 10</i>
27 May	Naturalism and the social structure of science <i>Godfrey-Smith, Ch 11</i>
29 May	Bayesianism <i>Godfrey-Smith, Ch 14</i> <i>William Talbott, "Bayesian epistemology", SEP</i>
3 June	Scientific realism <i>Godfrey-Smith, Ch 12</i> <i>van Fraassen, "Arguments concerning scientific realism", e-reserves</i>
5 June	Overview and conclusion