145: Philosophy of Science

Christian Wüthrich Fall 2011

Class schedule:	TuTh 5:00-6:20, SEQUO 148
Website:	`http://philosophy.ucsd.edu/faculty/wuthrich/`
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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.
- The 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 grade to the curve, i.e., the top 25-30% of the students in this class (including all who take it for a letter grade or a P/NP, but not including the withdrawals W) will get a grade in the A range (A+, A, A-), the next 25-35% a grade in the B range (B+, B, B-), the next 25-30% a grade in the C range (C+, C, C-), and the remaining 5-25% a D or an F. This is the minimum I guarantee; if the class has worked very well and no one deserves a D or an F, I will adjust the curve upwards, accordingly.

1. *Quizzes* (30 points): There will be **five short quizzes** during the quarter, each worth 6 points. They will be announced in class one meeting before they will be held. No make-up quizzes will be given.

2. *Midterm paper* (30 points) [`http://www.turnitin.com`]: There will be a **take-home midterm paper** due on 3 November 2011. I shall hand out a list of paper topics fairly early in the course. For each day your paper is late, five points will be deducted from your point total, although no negative point totals will be given.

3. *Final exam* (40 points): There will be a **final exam** on 9 December 2011, 7 to 10pm, 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 paper must be submitted through `http://www.turnitin.com` *by the due date* in order to earn credit. You must enroll at `http://www.turnitin.com` by creating a new profile. You will need the following course information:

Class ID: 4253642
Enrollment Password: phil145fa11

Note the difference between lower case 'l' and the number '1'. If you have any problems with using `http://www.turnitin.com`, you can contact the Instructional Web Development Center of Academic Computing Services at 858-822-3315 or 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://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

Final Exam: Friday, 9 December 2011, 7 to 10pm

Date	Topic and reading assingments
22 Sep	Introduction: What is science? What is philosophy of science?
27 Sep	A brief history of philosophy of science *Godfrey-Smith, Ch 1*
29 Sep	Demarcating science vis-à-vis pseudoscience *Ruse, "Creation-science is not science", e-reserves* *Laudan, "Commentary", e-reserves* *Ruse, "Response to the commentary", e-reserves*
4 Oct	Laws of nature I (Guest lecturer: Professor Craig Callender) *Alan Chalmers, "Why should the world obey laws?"* *Helen Beebee, "The non-governing conception of laws of nature"* *John W Carroll, "Laws of nature", SEP*
6 Oct	Laws of nature II (Guest lecturer: Professor Craig Callender)
11 Oct	Logical empiricism *Godfrey-Smith, Ch 2*
13 Oct	Explanation: D-N model (and I-S model) *Hempel, "Two basic types of scientific explanation", e-reserves* *Godfrey-Smith, Secs 13.1 and 13.2* *James Woodward, "Scientific explanation" (selections), SEP*
18 Oct	Explanation, reduction, unification *Godfrey-Smith, Secs 13.3 and 13.4* *Philip Kitcher, "Explanatory unification", e-reserves*
20 Oct	Induction and confirmation *Godfrey-Smith, Ch 3* *Carl G Hempel, "Studies in the logic of confirmation (I) and (II)" (selections), e-reserves*
25 Oct	Underdetermination and holism *Duhem, "Physical theory and experiment" (selections), e-reserves*
27 Oct	Popper's falsificationism *Popper, "The problem of induction", e-reserves* *Godfrey-Smith, Ch 4*
1 Nov	Kuhn and normal science *Godfrey-Smith, Ch 5*
3 Nov	Kuhn and revolutions **(Paper due)** *Godfrey-Smith, Ch 6*
8 Nov	Lakatos, Feyerabend *Godfrey-Smith, Ch 7*
10 Nov	The challenge from sociology of science *Godfrey-Smith, Ch 8*
15 Nov	Feminism and science studies *Godfrey-Smith, Ch 9* *Okruhlik, "Gender and the biological sciences", e-reserves*
17 Nov	Naturalistic philosophy *Godfrey-Smith, Ch 10*
22 Nov	Naturalism and the social structure of science *Godfrey-Smith, Ch 11*
29 Nov	Bayesianism *Godfrey-Smith, Ch 14* *William Talbott, "Bayesian epistemology", SEP*
1 Dec	Scientific realism *Godfrey-Smith, Ch 12* *van Fraassen, "Arguments concerning scientific realism", e-reserves*